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1st INTERNATIONAL EDUCATION

postgraduate seminar

Proceedings Volume 1

*“ Innovation, issues and challenges
for educational sustainability ”*

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EDUCATIONAL SUSTAINABILITY**

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Message from the Patron

PROF. DR BAHARUDDIN ARIS

Assalamualaikum Wrt Wbt and warmest greetings!

In consonance with Universiti Teknologi Malaysia's aspiration to be recognised as a world class centre of academic and technological excellence through its commitment in enhancing innovative education and developing cutting-edge research while perfecting the technical and professional workforce of the nation, I am pleased that the Faculty of Education with strong support from its Postgraduate Student Society (PGSSFP) is organising the first International Education Postgraduate Seminar (IEPS2014).



One of the basic aims of research is to make human lives better, including the researchers themselves. To achieve this, researchers need to go beyond producing good dissertations. Research findings must be disseminated to become part of international literature to allow a more robust and condensed understanding of different phenomena in theoretical and practical avenues. Sharing research findings and future objectives of exploration via presentations and publications is essential in helping researchers enhance self-development, expand intellectual horizon, and acquaint with the publishing and sharing practices. Research cannot and should not be done in isolation; I hope this seminar will not only provide young and budding researchers a glimpse of the world of research that all academicians need to embrace but also foster connections and collaborations between researchers.

Seeing this seminar taking place gives me great pleasure. I applaud the concentrated efforts between lecturers, support staff and postgraduates at the Faculty. I am also very proud of all the presenters and participants who are part of the community of this first IEPS2014. This is indeed a great step forward for everyone!

Congratulations!

Message from the General Chair
DR AZLINA MOHD KOSNIN

Assalamualaikum Wrt Wbt and warmest greetings!

It gives me great pleasure to welcome everyone to the International Education Postgraduate Seminar (IEPS2014).



With the aim to transform all of research activities of the education postgraduates into an event of sharing and communication, IEPS2014 provides excellent opportunities for students to share initial findings and research directions and to receive helpful critique that will guide them towards better practices. This event will not only be helpful in informing research practices but will also be a contributor in developing students as future researchers and academicians.

The theme of this seminar, “Innovation, Issues and Challenges for Educational Sustainability” is most accurate to be brought forward because this theme signals the important shift in education. Be it in curriculum development, assessment, leadership, science education, vocational education, psychology, counseling, or multimedia education, the aims of research in education must be geared towards achieving educational sustainability.

To IEPS2014 Advisory and Organising Committee, I congratulate you for spearheading this FIRST International Education Postgraduate Seminar (IEPS2014). I would also like to express my sincere gratitude to the School of Graduate Studies for the generous grant, support and contribution. This appreciation also goes to everyone who have contributed in one way or another. Thank you for seeing the potentials of our postgraduates, for investing in their future, to inspire and to foster successful community.

To all delegates, presenters, and participants, this seminar is now all yours. I hope everyone will find the seminar inspiring and enriching, through discussions and networking with new acquaintances and colleagues.

Message from the Organising Chairperson
FARHANA DIANA DERIS

Assalamualaikum Wrt Wbt and warmest greetings! Welcome to the FIRST International Education Postgraduate Seminar!



In promoting educational sustainability, we need to take into account the context in which we live in, and the ways in which the world is interrelated; the society today lives in a world that is decisively supported and interconnected by technology. Embracing this monumental advancement, educational institutions need to produce world-class human capital with competent skills and intellectual capacity, commendable traits, values and attributes that are pertinent in the present and future context and necessary in thriving in this social and technological context.

This indeed highlights the importance of deliberation and exchange of ideas, experience and opinions in the pursuit of improving the different fields of education. Thus, this seminar, aptly themed, “innovation, issues and challenges for educational sustainability”, is very timely. This seminar also captures the overarching role of multiple perspectives in informing practices, revolutionising the way teaching and learning are conceptualised, and inspiring new methodologies. Therefore, I hope this two-day seminar not only will enrich participants with research-related experiences but will also pave the way for fruitful dialogues and insightful deliberations towards achieving educational sustainability.

I would also like to take this opportunity to express my sincerest gratitude and appreciation to everyone who have contributed in one way or another to the success of this seminar, especially to the organising committee, the Postgraduate Student Society, Faculty of Education (PGSSFP). To all invited speakers, presenters and participants, thank you for your participation and support, without which this seminar would not have been possible.

See you again at the SECOND International Education Postgraduate Seminar!

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THE INTEGRATION OF HIGHER ORDER THINKING SKILL IN ONLINE COLLABRATIVE ENVIRONMENT USING STATION ROTATION MODEL

Suhaimi Zakaria @ Othman, Norasykin Mohd Zaid, Zaleha
Abdullah, Hasnah Mohammed & Baharuddin Aris

ABSTRACT

The development of Higher Order Thinking Skill (HOTs) among Malaysian student must be strengthened in order to boost the insight of knowledge in Science, Technology, Engineering and Mathematics (STEM). As for that reason, Ministry of Education (MoE) Malaysia give a lot of effort to do a vast transformation in the Education System by introducing the Malaysian Education Blueprint (PPPM) 2013-2025 to suit the 21st century learning. The interpersonal skill of the student in conveying idea and practically solving the problem by their own collaboratively is the most precious experience before assimilate themselves to the real world more than just learning by heart. This research discuss about the implementation planning of HOTs in Mathematics focusing on the Malaysian secondary school using the integration of Online Collaborative Learning and Station Rotation Pedagogy Model of Blended Learning. Online social media can be one of the potential platforms in enhancing the interpersonal skill among students. This concept paper is expected to give some suggestion or input thus contribution to the education field in Malaysia related to the method or approach in developing HOTs which can be suited with Malaysian setting.

Keywords: blended learning, online collaboration learning, rotation station model

1.0 INTRODUCTION

Educational sector is the main contributor in producing valuable human capital which will contribute to development continuity of the country (Šlaus and Jacobs, 2011). Significantly, the government believe that the slump in international assessment ranking of Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) in 2009 provide challenge to increase the mastery of Higher Order Thinking Skill (HOTs) among the Malaysian student (Kementerian Pendidikan Malaysia, 2012). As for that reason, the Malaysian Education Blueprint (PPPM) 2013-2025 with 11 main shifts are introduced to upgrade the quality of Malaysian Education System to be more globally competent. The transformation in Teaching and Learning (T&L) strategy by empowering HOTs especially in Science and Mathematics is hoping to encourage capability of innovative and creative thinking to flourish the student achievement, self-resilience and determination in being the complete package ready for reality environment. Blended Learning potentially is one of pedagogical approach that can be used to enhance HOTs with T&L where it will helps to support the creativity element in Science, Technology, Engineering and Mathematics (STEM) knowledge (Ministry of Education Malaysia, 2013).

2.0 ROTATION STATION MODEL IN BLENDED LEARNING

Aligning the goal in enhancing HOTs element in T&L, innovation on pedagogy approach plays a main role. The blooming of technologies in 21st century in this present also give a lot of impact

in education industries focusing in engaging student interest to knowledge that we convey in the class by actively increase the curiosity and understanding of the student in every subject that they have to learn (Madhuri *et al.*, 2012; Peters *et al.*, 2011). Wagner (2014) said that the online tools such as social network and apps plays a major role in this era. In order to succeed in the learning, students must be equipped with 5 survival skills, i.e. (i) critical and problem solver, (ii) collaborative skill through network and influential leader, (iii) entrepreneurialism and self-initiatives, (iv) effectiveness in written and oral communication with efficiency in accessing and analysing information (v) curiosities and imaginative in learning. All the above skills can be achieved from the benefit of blended learning approach as shown in Figure 1. There are 4 common type of hybrid approach models listed in blended learning that are (i) Rotation Model, (ii) Flex Model, (iii) A La Carte Model and (iv) Enriched Virtual Model. For this research, Station Rotation Model will be the main focus to implement in the classroom rather than Lab Station, Flipped Classroom and Individual Rotation which is an instances of Rotation Model (Horn and Staker, 2011).

Station Rotation Model design as shown in Figure 2 is a T&L approach that involve the preparation of minimum three group of students to form three learning stations. One of the stations must be assigned with online learning activities to foster capability of Self Directed Learning while other stations will undergo the teacher instruction or collaborative activities respectively or any suitable activities. The activity in every station will rotate according to the session of the subject in a fixed schedule. Alternatively, the whole class may play role as a station and the activities rotation are schedules depending on the subject session (Staker and Horn, 2012).

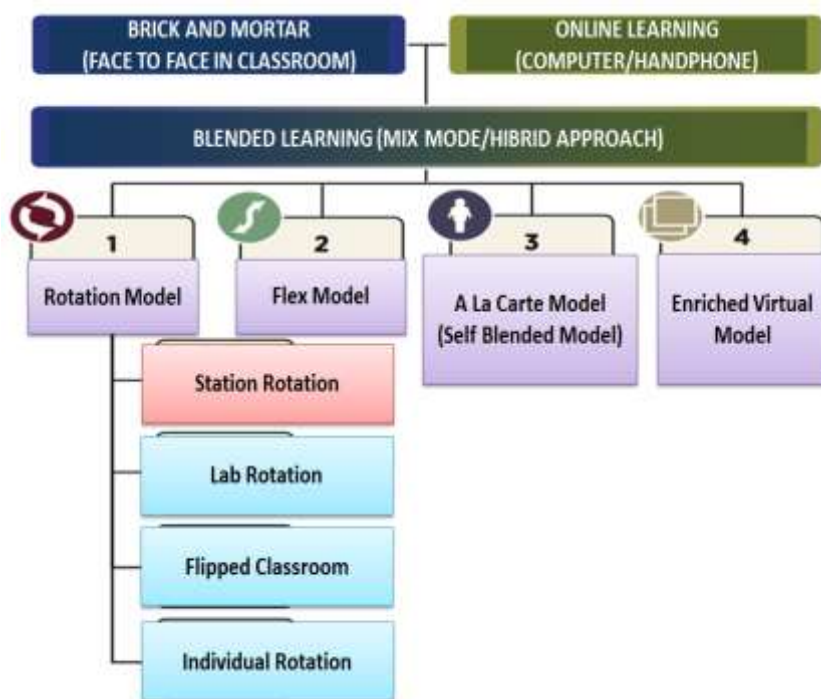


Figure 1: Blended Learning (Christensen *et al.*, 2013)

In this research, focus is given on the approach of Station Rotation Model pedagogy because of the capability of this model in enhancing the student self-motivation of learning and engagement, increases resource and learning flexibility, potentially effective pedagogical approach, maximise social learning application usage and decreases digital divide among student (Staker and Horn, 2012).

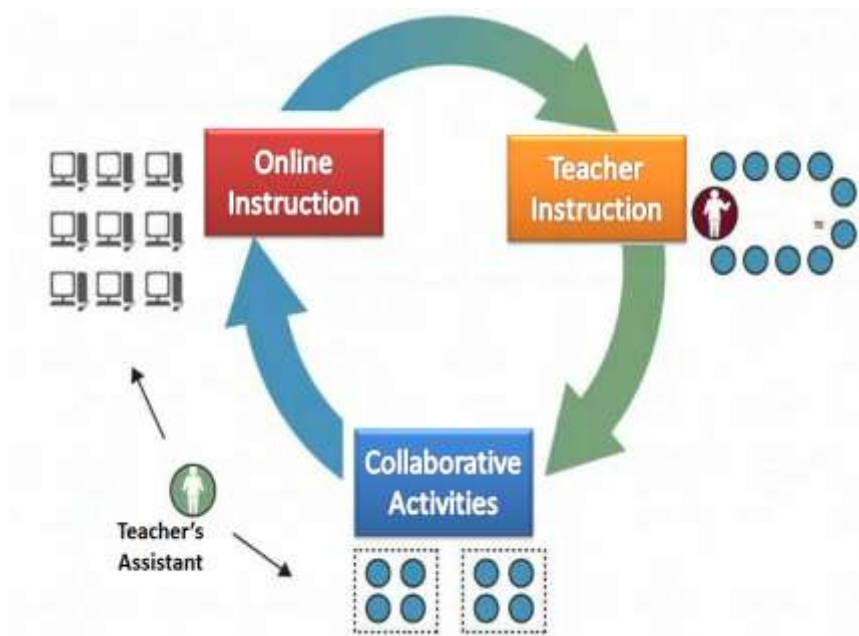


Figure 2: Rotation Station Model (Christensen et al., 2013; Staker and Horn, 2012)

3.0 HIGHER ORDER THINKING SKILL (HOTS)

According to Lembaga Peperiksaan Malaysia (2013), HOTS is defined as an ability to apply knowledge, do reasoning and reflexes on given problem solving, make decision, create innovation and built invention. The fundamental of cognitive processes are to generate and organize information, be able to do analysis and synthesis, creating creative work and making evaluation. There are four levels of cognitive in HOTS: (i) Applying, (ii) Analysing, (iii) Evaluating, and (iv) Creating as illustrated in Figure 3 and following explanation:

- i. **Applying** - to use procedure through implementation.

- Students have to show, complete, classification, detail, illustrate, use and solve.
- ii. **Analysing** - to break material (concept) to smaller parts, determine how the parts relate with one another or to make explanation about the structure or meaning of the material (concept) thoroughly. Students have to compare, explain, test, identify categories, investigate and differentiate.
 - iii. **Evaluating** - to make judgment based on the criteria and standard through inspection and criticism. Students have to justify, evaluate, suggest, determine, judge, propose and choose.
 - iv. **Creating** - to incorporate difference elements together in developing coherent material that function completely. To rearrange difference elements to make a new pattern and structure by generating, planning or producing. Students have to create, design, plan, invents, construct and imagine.

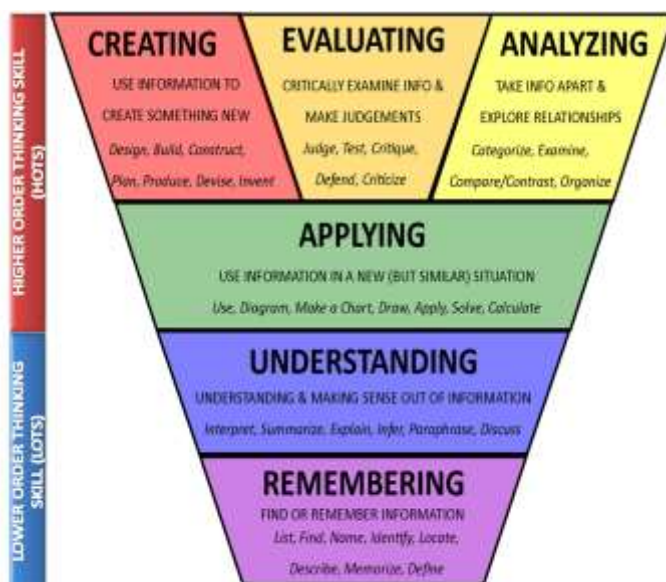


Figure 3: Bloom Taxonomy (Revised by Anderson)

(Anderson and Krathwohl, 2001; Lembaga Peperiksaan Malaysia, 2013)

4.0 HOTS IN COLLABORATIVE ACTIVITIES AND TEACHER INSTRUCTION IN ROTATION STATION MODEL

Teri *et al.* (2013), Jahnke (2010) and Zuraina (2009) research have proved that HOTS can be nurtured through Cooperative and Collaborative Learning. Discussion activities that apply among students in this model increase the empowerment of in-depth knowledge especially when integrated with Thinking Tool construction such as Mind Map, Graphical Notes, Problem Solving, Problem Posting and Cognitive Research Trust (CoRT). Thinking Tools is not only helps the students in handling the oral skill and visualisation but also enhances the level of memory and understanding to the next level as shown in Figure 4 (Kiong *et al.*, 2010; Som and Mohd Dahlan, 1998).

4.1 Mind Mapping

Mind Mapping is commonly used as a Thinking Tool such as illustrated example in Figure 5. It is sketched according to a main title or theme written at the centre and several lines of fundamental ideas are then projected from the chosen title. In order to show the explanations or description of every fundamental idea, branches are drawn out of every projection line. Usually, it is used to make short notes, blueprint of a project, brief idea of an essay or presentation, sketch memory of a concept in knowledge and improve the affiliation equilibriums of right and left brain usage thus simulate the effectiveness in learning experiences. Today, i-Think concept that introduces by the Ministry of Education Malaysia is one of the Mind Mapping twist in representing and memorising knowledge as shown in Figure 6.

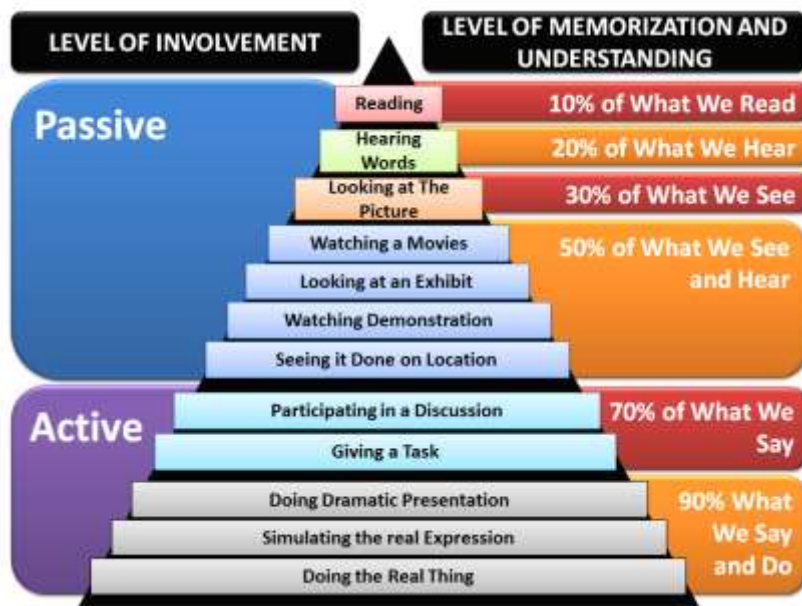


Figure 4 : Learning Pyramid (Dale, 1946a; Dale, 1946b).



Figure 5 : Example of Mind Mapping (Perez, 2013)

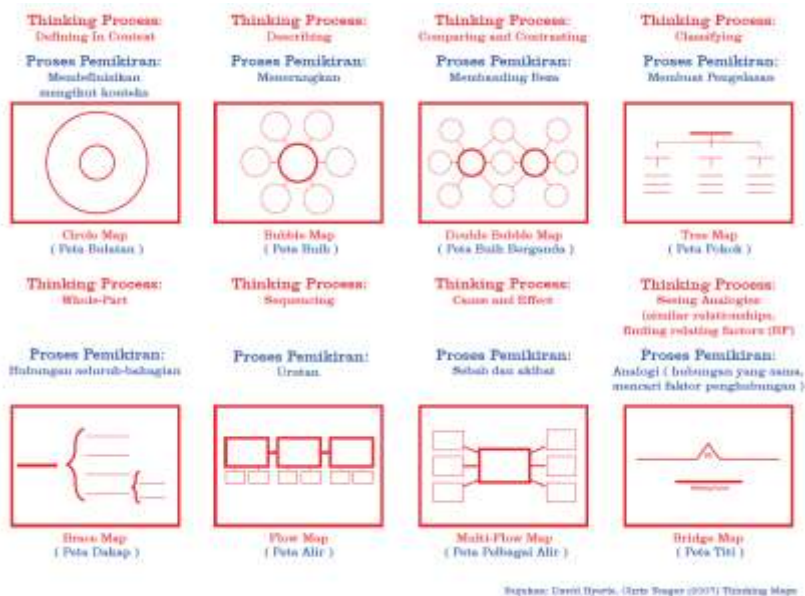


Figure 6 : i-Think Mind Mapping Concepts (Bahagian Pembangunan Kurikulum, 2012).

4.2 Construction of Question and Questioning

Question constructing and posting perhaps would stimulate the student thinking skill abilities in grasping information, identifying level of understanding, discovering interest and evaluate talent in any knowledge affairs. A good question helping us to think deepens and widen by considering some aspects such as level, scope and focus:

- i. Level: Bloom Taxonomy level shown in Figure 7 must be taken as consideration meaning in constructing a question.

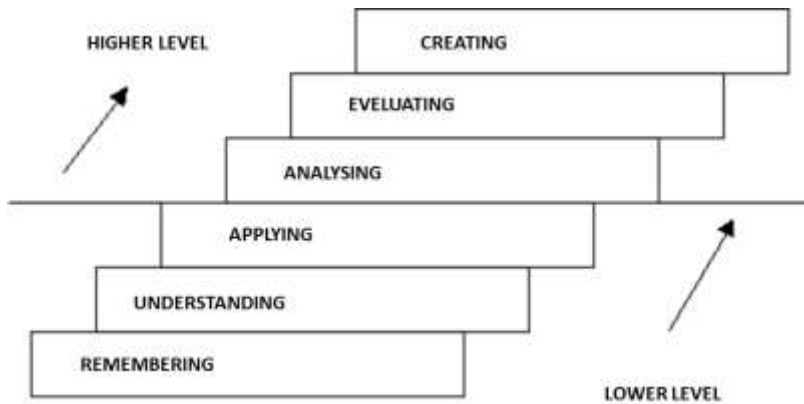


Figure 7: Bloom Taxonomy Level (Anderson and Krathwohl, 2001)

ii. Scope referred to the construction of questions based on subject matter of knowledge that the user deals or discuss which will be the simulation of the focus matter (i.e. issues, topic or problem), the student relation with the matter (the personal reality) and extended perspective about the matter (the external reality). All the elements are graphically explained in the Christenbury-Kelly Model named Questioning Circle shown in Figure 8. Significant HOTs question are derived from overlapping part in the circles. The combination of the three scopes increase generation of variety of questions in enhancing student thinking skill (Wilen, 1987).

As an example of Questioning Circle in Subject of General Knowledge:

- | | | |
|--------------------------------------|---|------------------------------------------------------------------------------------------|
| <u>Matter</u> | : | Name five types of our national car? |
| <u>The Personal Reality</u> | : | Do you like to buy our national car? |
| <u>The External Reality</u> | : | What is your role as a member of society to maintain the popularity of our national car? |
| <u>Matter + The Personal Reality</u> | : | In your opinion, how can we help to increase popularity and |

- The Personal Reality + The External Reality : performance for our national car? Other countries have less interest in importing our national cars. What is your comment in this matter?
- Matter + The External Reality : What are the difference between our national cars and the imported ones?
- Matter + The Personal Reality + The External Reality : The imported cars are more quality then the nationals. Give your argument on this issue.

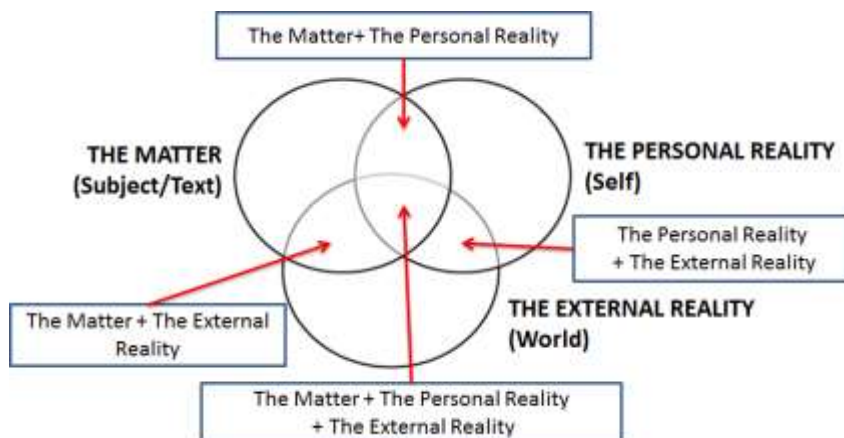


Figure 8: Questioning Circle (Wilens, 1987)

iii. Focus. Question can be categories as Convergence and Divergence. Convergence Question (a.k.a. Closed-Ended Question) is recognized when the questions only asked to give a fact answer that they have already memorize or learn before. While Divergence Question (a.k.a. Opened-Ended Question) needs the students to apply, explain, extrapolate, integration, analysis and use the fact that they have already learn before displaying or giving their pure thinking answers related to the question.

Table 1: Comparison of Convergence and Divergence Question.

CONVERGENT QUESTION (CLOSED ENDED)	DIVERGENT QUESTION (OPEN ENDED)
Lower Level	Higher Level
Limited Response or Answer	Unlimited Response or Answer
Close Form	Open Form
Suitable in Testing on Memory Ability	Suitable in Testing on Reasoning And Evaluation
More Objective in Characteristics	More Subjective in Characteristics

Example of Convergent Question:

What animals are using colour as a main camouflage element?

The question only test on the student ability to identify the role of natural camouflage and colour of an animal. The answer is by giving examples from the remembering the learning and visualisation process.

Example of Divergent Question:

If the lion is borned with the quite dark fur, what can you predict will happen to the lion in their natural habitat?

Question allow student to consider a scenario-utilised knowledge on camouflaged, fur coloration and habitat surrounding the animal to create a true logical answer.

4.3 Graphical Notes

Graphical Notes will be illustrated in a form of sketches in assisting the student to rearrange the knowledge obtained. The colour and management of the shapes, texts, pictures and lines stimulate the relationship of the idea or concept in one whole picture clearly such as shown in Figure 9. Elements of knowledge integrated in graphical notes are comparison or difference, categorisation, partly

or thoroughly detailing, step by step process (sequence), causal explanation, prediction, investigation of assumption, inference, validation of information resources, idea, analogy, metaphor, result and problem solving.

Development of graphic notes involves some working steps that have to be emphasizes.

- i. Idea planning and arrangement.
- ii. Understand about self-thinking.
- iii. Interpret information whatever in the mind into written orientation.
- iv. Relating all collected information by varieties of connections.

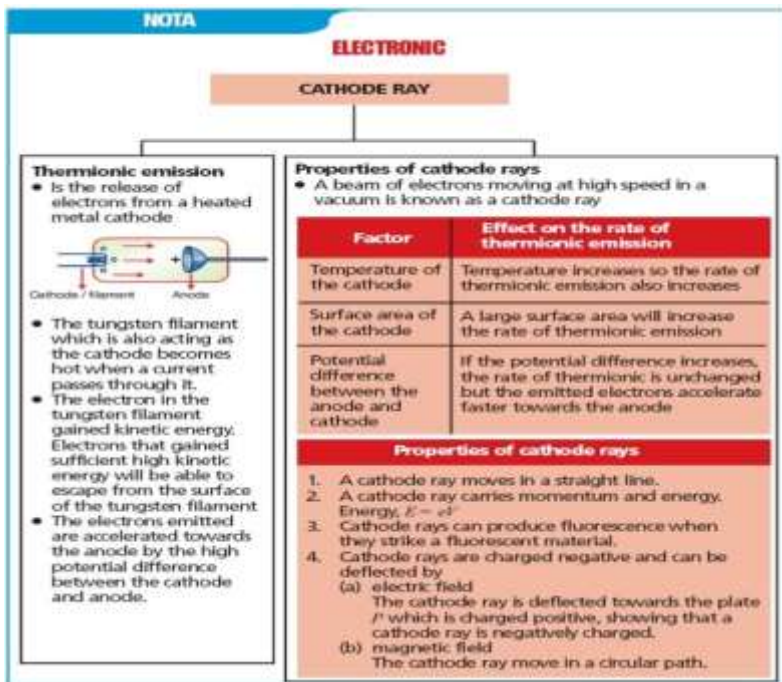


Figure 9: Example of Graphical Note (Farah, 2008)

4.4 Cognitive Research Trust - CoRT

In generating the thinking faculties, Cognitive Research Trust (CoRT) which was introduced by Edward de Bono will be the most inspiring tool to use in building the skill and art of thinking among the student. In his opinion, thinking practises occurred in perception level and this tools is built specialise to teach practitioner a good thinking method (Khalid, 2010; Som and Mohd Dahlan Mohd Ramli, 1998; Ritchie and Edwards, 1996). CoRT tools are explained as following:

i. PMI (Plus, Minus, Interesting)

Plus (strengths – reason of selection and the benefit), **Minus** (Weaknesses, reason of unsuitable and problem to be faced) and **Special** (interest, future implication and relation with status quo) about a matter/idea which must be consider as the first step before any action is carry out. It is similar to find the Pro and Contra or SWOT (**S**trength, **W**eaknesses **O**pportunities and **T**hreats) analysis of a proposal.

Example of scenario: All windows must be made up from plastic compare to glass.

Plus (Strengths) : *Unbreakable, not too dangerous when it is broken and easy to transport in a big amount because of the resilient characteristics.*

Minus (Weaknesses) : *Expensive compare to glass, easily scratch and easy to liquefy.*

Specials (Interesting): *Window can be in variety of colour if it is made from plastics, the changing of the window basic material other than glasses is not so important, perhaps we can consider layering the plastics window with anti-scratch material.*

ii. CAF – Consider All Factors

Consider All Factors related with the matter discussed before decision, action, planning, evaluation or conclusion is made. It's better to understand the detail thoroughly.

Example of scenario: A newly-wed couple bought a second-hand car their family.

Factors involved in selection:

- Whether the car seller is the owner of the car or not?
- The price of the car.
- Type and colour of the car.
- Power and speed of the car.
- All the mechanical parts of the car are function with good condition.
- The size of the car enough for one family.
- Is the car involved in any accident?
- The easiness to retrieve spare part of the car.
- Is the car own individual grant and included with tax?
- Is the car potentially valuable for reselling?

iii. C&S – Consequence and Sequel

A process to see the causal or consequence happens when action, plan, decision, regulation or creation is performed. It is according to the significant value in short term (1-2 years), medium term (2-5 years) and long term (more than 5 years).

Example of scenario: One of the Malaysian citizens introduces an imported Rabbit species in this country for hunting purposes. The species were release in enormous numbers as it is became hunting prey for his friends.

Short Term Effect: A lot of prey for hunting purposes, rabbit will be alternative resources of food and entertainment material and rifle

	gun sold freely without limit.
Medium Term Effect	Rabbit is fast breeder and will be one of the pests.
Long Term Effect	Rabbit will breed freely around Malaysia and it will destroy all farmers' plant.

iv. AGO – Aims, Goal and Objectives

Aims, Goal and Objectives will be emphasis on the propose idea.

Aims - General direction

Goal - Main direction

Objective - Important targets that must be achieved before earning the goal.

Example of scenario: Development Company constructs a new shopping mall.

Aims : Developing the arrangement of Shopping Complex.

Goal : Finish the shopping mall.

Objective :

- Developing shopping mall successfully.
- Amazed the visitor.
- Fulfilling the owner desire of the mall.
- Finish the mall on time with fixed financial budget.

v. FIP – First Important Priorities

The need to think in categorising, classifying or separating according the priority of the matter such as idea, factor, objective and need in order to assist the action easily. It can be integrated with other technics such as CAF, AFC and so on. FIP is used to maintain the balance of one's consideration because it relies to the current situation and there is no right and wrong action.

Example of scenario: A newly-wed couple bought a second-hand car their family.

- Whether the car seller is the owner of the car or not?
- The price of the car.
- Type and colour of the car.
- Power and speed of the car.
- All the mechanical parts of the car are function with good condition.
- The size of the car enough for one family.
- Is the car involved in any accident?
- The easiness to retrieve spare part of the car.
- Is the car own individual grant and included with tax?
- Is the car potentially valuable for reselling?

List of selection factor:

- Whether the car seller is the owner of the car or not?----- 3 votes
- The price of the car. -----
----- 4 votes
- Type and colour of the car. -----
----- 9 votes
- Power and speed of the car.-----
----- 4 votes
- All the mechanical parts of the car are function with good condition.--- 3 votes
- The size of the car enough for one family.-----
----- 11 votes
- Is the car involve in any accident?-----
----- 3 votes
- The easiness to retrieve spare part of the car.-----
----- 10 votes
- Is the car own individual grant and included with tax? ----- 4 votes
- Is the car potentially valuable for reselling?-----
----- 5 votes

Ranking of the selection factor:

- The size of the car enough for one family.-----
----- 1
- The easiness to retrieve spare part of the car.-----
----- 2
- Type and colour of the car.-----
----- 3

vi. APC – Alternatives Possibilities Choices

Finding and thinking the Alternatives Possibilities Choices other than the propose matter (action or explanation).

Example of scenario: You had just arrived at the school and you found that goal post were disappeared. What had already done?

List of possibility occurred: (i) The vandal already cut off the goal post and sells it, (ii) The car had already ramp into the post until it break down. As for the safety purposes, it had already being thrown away, (iii) PE teacher just cut down the post because the size of the goal post does not obeying the regulation, (iv) The local football player already lends it for competition purposes, (v) The pole-vault athlete borrow it for immediate practise, (vi) The javelin throwing competition occurred at the end of last week (v) New building will be built on the field.

vii. OPV – Other People View

Take an account of others opinion to consider in supporting the result and action.

Example of scenario: The differences in views when looking at the chicken on the field

Stakeholder	Views
Person who starving for food	“Oh my God! That is my lunch, today.”
Farmer	“Is there anyone cares to feed my Chickens?”
Chief	“This will be the best dish ever.”
Children	“This is my pet.”
Vegetarian	“It is the wrong to take food with face on it.”
Other Chicken	“Cluck, cluck, cluck, cluck...”

The effectiveness of class instructions and activities with the students depending fully on the teacher’s planning process of T&L. The thinking tools are generally perhaps alternative ways to engage student attention to the learning process and assimilate with the new knowledge they have learned. If the students are actively involve with the learning process with fully hearted, they feel the fun behind the manipulative or physical activities (i.e. experimenting) and mental endurances. This pedagogy invokes the usage of divergent thinking where the students have to look further and evaluates thoroughly in every aspect freely before any decision is made up. Integration with convergent thinking by default may also reorganise the student method of thinking in giving out the only required answer for a certain simple closed ended questions. The divergent level of the question in T&L influences the development of the brain among the students consequently because of progression of neurons networks in the process of problem solving. The diversity of solutions or answers that triggers for a question shows that the student HOTS beginning to blooms out persistently as they remains practise for the whole their lives (Chermahini and Hommel, 2012; Runco and Acar, 2012).

The usage of any combination thinking tools not only assist in T&L process conveying Thinking Based Learning approach, but also stimulate the student to assimilate meaningful skills of knowledge in criticise and creativity. Students would criticise by using their own competency ability of mind to evaluate reasonably of an idea, strength or weaknesses of an argument and make

appropriate consideration using reasons or proves. Moreover, the creativity skill of students utilise the efficiency of mind in generating and producing idea, creating variety of new extraordinary valuable invention (i.e. concrete, abstract, idea or concept) and exploring meaningful understandable problem solving innovatively. When thinking tools is immersed with social network tools, the utilising process of mind in finding out the meaning or understanding about something will be maximised. Other than that, these online tools may also help the students in exploring a variation of idea or invention and making appropriate consideration in making decision or solving problem thus they would rather tend to make a reflection dan metacognition (Aizikovitsh-Udi and Amit, 2011; DeHaan, 2011; Mumford *et. al.*, 2012).

5.0 HOTS IN ONLINE LEARNING IN ROTATION STATION MODEL

Constructivist Jean Piaget and Lev Vygotsky in perspective in Blended Learning, student must actively do their self-exploration and self-directed learning to develop self-confident in the skill of Online Collaborative Learning (OCL). Thus, the students may get their social support to scaffold the development of knowledge through HOTS (Griffin, 2011). The continuum of OCL as shown in Figure 10 display several level in directing the e-learning through Mastery Learning and it is depend on the student effort. As we look along the continuum from e-Reading to e-Learning, the investment value for Instructional Design increase so it is worth if the students' thinking skill can be generated until 70%. Currently, Online Simulation is not suitable for because of the high maintenances cost although it would make until 90% thinking skill. The best method in maintaining the knowledge is by practising face to face instruction integrated with Online Learning in helping the student in memorising knowledge that they have already learned (Dam, 2008).

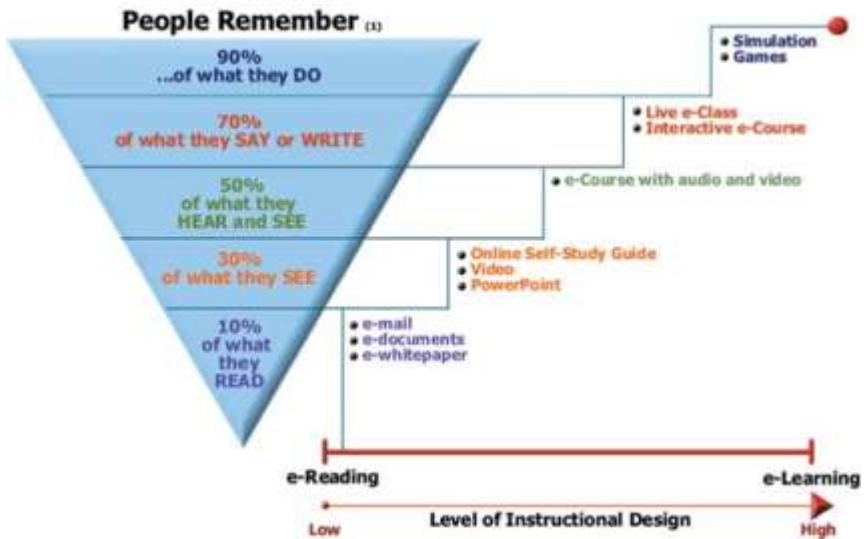


Figure 10: Continuum in Online Learning (Dam, 2008)

6.0 CONCLUSION

As the conclusion, Station Rotation Model which combines Discussion Activities and Online Learning has a potential to increase HOTS among the student. The approach requires students to think creativity and critically in order to answer for every questions posted by the teacher. Previous research has not venture to integrate the Station Rotation Model with Online Collaborative Learning (OCL) proposed earlier in this paper. Therefore, the effectiveness of this combination in increasing HOTS among the students has yet to be examined.

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WHAT LIES BETWEEN INSTRUCTIONAL LEADERSHIP AND ORGANIZATIONAL COMMITMENT

Valliamah @ Shoma Vally G. & Khadijah Daud

ABSTRACT

Leadership and commitment shared interdependent relationship. How deep is the relation? What is the supporting evidence? This general review article is an attempt to unfold the matter related instructional leadership and organizational commitment using literature analysis. This review seeks to explore school principals' instructional leadership towards teachers' organizational commitment. To meet this purpose the study focused on addressing the following research questions based on literatures determining the factors in principal instructional leadership practices and determining the relationship between instructional leadership factors and teachers' organizational commitment. This article continues to analyse selected journals key word 'instructional leadership' and organizational commitment'.

Keywords: Instructional leadership, organizational commitment

1.0 INTRODUCTION

Basically, school function as human capital production for a country. Therefore, leader with instructional leadership competencies required to serve this purpose and to lead the school for its peak. Hence, school and leadership are two entities that walk

and work together. Furthermore, prior research provide evidence principal directly affect teachers especially commitment not to students learning (Griffith, 2004). Ticket that promise success for this mission is the behaviour of a leader join hand with teacher and carry the task of implementation process so that they can offer the best for their customers. Cooperation with these two party are crucial for improvement and leadership success especially the instructional process that take place either in classroom or outdoor activities. Principal as the head of the school should lead by example, be a role model and carry important task in defining school mission and goal, managing instructional program, and develop school learning climate. Task force that work out this in practical are the teachers of the school. Due to that teachers commitment in school organization become crucial, even though accountability rest on principals shoulder. Thus, principal leadership should display promising skills in handling teachers affair at the same time move forward the organization align with national curriculum.

1.1 School Instructional Practices

School provides the platform for principal to display his/her leadership practices. As school system revolves the challenges comes along continuously. The need to cater changes occur without compromising improvement in training, work relation, goal setting, supervision, monitoring student performance, provide professional development for teachers (Hornig, Klasik, & Loeb, 2010; Hallinger & Lee, 2013). These changes undeniably influence teachers' instruction, performance and commitment towards school (Kowalski, 2010). There are claims saying principal does not portraying good leadership and apologizing openly for lack of knowledge in meetings (Kowalski, 2010; Hassenpflug, 2013) and hardly find time to lead (Hallinger & Murphy, 2012). Management time occupied for attending too many meetings, handling clerical

staff, dealing with parents, and student issues rather than handling instructional issues. Furthermore, principal training focused more on managerial and organizational issues rather than instructional program or curriculum development (Lambert & Hogan, 2010; Hassenpflug, 2013).

One man show is not proper for a principal, as school performance and student achievement need teachers collaboration and cooperation, in another word teachers' commitment. Teachers as follower expecting to see leader who able to lead, poses proper skill, competent, expert in their area and accountable (Bloch & Whiteley, 2003), capable in managing instructional program. Furthermore, instructional leadership skill 'developing school goal', 'managing instructional program', 'evaluating staff', and 'develop school learning climate' is vital in success of a school yet it is not the only task to be performed (Hulpia, Devos, & Keer, 2011) even tough instructional process as the core school performance indicator is undeniable. Consistency in leadership efficiency is the foundation for effective principal (Valentine & Prater, 2011). Earlier study shows principal can highly motivate their subordinates to be committed to the organization (Hoy & Miskel, 2005) and there are claims that today's principals' are lacking instructional leadership skills (Khan, 2012). This initiates the interest to explore the relationship between instructional leadership and teachers' organizational commitment.

Teaching and learning tied with teachers' prime duty and responsibility. They are the manpower carrying out the implementation task for school goal and mission through instructional process. In any institution or organization, employees' commitment is crucial for painting its achievement; in fact it is not an option when dealing with school and principal. Research spotted principal does not give urgent attention for instructional task, even though it falls into the most important category. Principal have to settle other day to day issues and managerial problems that need to be focused (Hallinger & Murphy, 2012) rather than instructional activities. Quantitative evidence related principal leadership issues is

less (Hallinger & Heck, 2010; Leithwood & Jantzi, 2000). There are study indicates that employee commitment is vital to keep up top performance (Khasawneh, Omari, & Abu-tineh, 2012) and committed employee create effective organization (Caillier, 2012). Yet, little is known about how much instructional leadership associated with teachers' organizational commitment. This gap further motivates earlier interest to explore the relationship between these variables.

2.0 REVIEW APPROACH

There were abundant of journal's related to transformational leadership and commitment (Avolio, Zhu, Koh, & Bhatia, 2004; Geijsel, Sleegers, Leithwood, & Jantzi, 2003; Khasawneh et al., 2012; Ross & Gray, 2006b; Yu, 2005; Dhammika, Ahmad, & Sam, 2013) or distributed leadership and commitment (Hulpia et al., 2011; Leithwood, Patten, & Jantzi, 2010; Heck & Hallinger, 2009; Hulpia, Devos, & Rosseel, 2009), unlike scholars interest the relationship of instructional leadership and students performance or achievement (Valentine & Prater, 2011; Tan, 2012; Ylimaki, 2013; Ross & Gray, 2006a; Leithwood et al., 2010) there were limited choice for instructional leadership and commitment discussed together (Tahir, Daud, & Rahmat, 2013; Peariso, 2011; Eginli, 2009; Dannelta, 2002). Even though, instructional leadership articles are limited not teachers' organizational commitment. Keeping this matter prior, only instructional leadership elements shall be discussed further.

2.1 Determining the factors in principal instructional leadership practices

Instructional leadership define as defining school mission, managing of an instructional programme, and creating positive school learning climate (Hallinger, 2005). Out of the 10 job functions of Principal

Instructional Management Rating Scale (PIMRS) of Hallinger, (2012) 'Frame the school goal', 'Supervise and Evaluate Instruction' and 'Promote Professional Development' hold the highest mean (Peariso, 2011). In a study done in Turkish, 'setting instructional direction', 'monitoring instructional activities' and 'providing professional development support' was discussed as for component principal instructional leadership practices (Gumus & Akcaoglu, 2013). It is notable in this study Turkish primary school principals are weak in implementing instructional leadership skills.

2.2 Determining the relationship between instructional leadership factors and teachers' organizational commitment.

Defining school mission is most dominant factor contributes to teachers' organizational commitment followed by developing school learning climate. Surprisingly Managing Instructional fall to the last place in contributing to teachers' commitment (Tahir et al., 2013). There were significant relationship between principal leadership and teachers' commitment (p90). Statistically shown principal leadership plays significant role in predicting teachers' commitment especially principal support elements (Eginli, 2009). Other than that, Dannetta (2002) found some of instructional leadership elements such as willingness to achieve organizational goal, orderly and conducive school learning climate, opportunity to grow professionally, and principal are some of the factors influence teachers commitment towards organizations.

It is also proven by prior study leaders deception affects negatively to organizational commitment, leaders unethical manner associated with organizations visibility. When subordinates aware of leaders engagement in deceptive behaviour, subordinates organizational commitment drops (Griffith, Connelly, & Thiel, 2011). Others studies also supported that leadership function 'supervision and evaluation' has strong link with organizational commitment (Hulpia et al., 2009), other functions 'defining school

mission', 'managing instruction', and 'professional development' happens to be increase teachers commitment in performing their instructional task more effectively (Higgins & Bonne, 2011). Thus, leaders' competence in practising instructional leadership function is vital for teachers' organizational commitment.

3.0 CONCLUSION

School systems minimize teacher professionalisms to favour bureaucratic and organizationally centred approach by appointing principal as instructional leader. Principal should be able to gain teachers confidence and support for them to be commitment to the organization, merely not only by showing competence in managerial task but also instils capabilities leading the school, fulfilling its core business the instructional function. Studies about leadership and organizational commitment still have to go a long journey to get to the deeper understanding leaving a gap for research. Quest to which leadership function effectively contributes to organization commitment is also recommended for future study. This research by Hulpia et al., (2009) limited to two large secondary schools and two leadership functions (support and supervision). This open platform for further study on more leadership functions in relation to commitment and differences between secondary and elementary school. To get in-depth explanation or understanding both quantitative and qualitative method can be employed. This review served as introductory exploring relation between instructional leadership and teachers' organizational commitment.

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MASALAH YANG DIHADAPI OLEH KANAK-KANAK SINDROM DOWN KETIKA SESI PEMBELAJARAN DAN PELAJARAN MATEMATIK

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ABSTRAK

Sindrom Down merupakan satu kecacatan genetik disebabkan kehadiran sebahagian atau kesemua kromosom 21. Kromosom merupakan serat-serat khusus yang ada dalam sel manusia yang mengandungi bahan genetik berkaitan dengan sifat seseorang. Terdapat pelbagai ciri-ciri fizikal yang boleh dilihat dan dikenalpasti oleh kanak-kanak Sindrom Down ini. Ciri fizikal yang terserlah ialah melibatkan bentuk muka yang sama dengan kanak-kanak yang mengalami masalah Sindrom Down. Kanak-kanak ini juga mengalami gangguan mental iaitu berfikir pada paras bawah normal. Terdapat banyak kajian yang dijalankan melibatkan kanak-kanak kurang upaya. Namun kajian yang meneliti aspek kognitif kanak-kanak Sindrom Down adalah kurang. Kajian ini dijalankan bagi meneliti persepsi dan pengalaman serta kaedah pengajaran dan pembelajaran bagi kanak-kanak Sindrom Down terutamanya dalam matapelajaran matematik.

Kata Kunci: persepsi, pengalaman dan kaedah pengajaran, Sindrom Down, matematik

1.0 PENGENALAN

Sindrom Down merupakan satu kecacatan genetik. Masalah ini juga dikenali dengan Trisomi 21 kerana terdapat kehadiran sebahagian ataupun kesemua kromosom 21 dalam diri kanak-kanak Sindrom Down. Perkataan Sindrom Down diambil sempena nama doktor yang mengenal pasti masalah ini iaitu Dr John Langdon Down. Beliau merupakan seorang doktor warga British. Beliau meneliti masalah berkaitan dengan Sindrom Down ini pada tahun 186 dan berjaya memberikan ciri-ciri Sindrom Down dengan lebih teliti hasil gabungan perbezaan besar dan kecil pada struktur badan. Sering kali kanak-kanak ini dijelaskan mempunyai masalah berfikir dan perbezaan tumbesaran mereka berbanding dengan kanak-kanak normal (Hulme dan MacKenzie, 1992; Bower dan Hayes, 1994). Perkembangan dari segi fizikal badan serta kemahiran bertutur adalah lambat berbanding dengan kanak-kanak normal (Kumin, 2003). Kanak-kanak ini mudah untuk dikesan seawal mereka bayi lagi berdasarkan ciri-ciri fizikal mereka yang ketara.

Kanak-kanak Sindrom Down mempunyai masalah kognitif iaitu lebih rendah daripada purata (Mon-Williams, et al ., 2001). Sering kali kanak-kanak ini mengalami masalah pemikiran iaitu terencat akal sama ada pada tahap sedikit ataupun sederhana. Masalah utama yang sering kali kelihatan ialah melibatkan satu pemikiran konkrit (KA Razhiyah, 2005). Oleh sebab itu, tidak pelik sekiranya kanak-kanak ini lambat untuk mempelajari sesuatu pembelajaran apatah lagi mengendalikan operasi dalam matematik.

Dianggarkan bahawa kanak-kanak Sindrom Down mempunyai tahap IQ yang rendah (Lewis, 1987; Zuriahwati, 2012). Ini menjelaskan bahawa mereka ini memiliki tahap pemikiran yang rendah dan memerlukan bimbingan yang khas untuk mempelajari sesuatu benda baharu dalam diri mereka. Namun begitu ini tidak menunjukkan bahawa mereka gagal untuk berdirikari. Mereka masih lagi mampu untuk menguruskan diri mereka dengan bantuan dan perhatian daripada pembimbing.

Berdasarkan perangkaan 2001, Kementerian Pendidikan

Malaysia menganggarkan seramai 290,000 murid sekolah daripada 4.9 juta murid berkemungkinan memiliki beberapa ciri dalam Masalah Pembelajaran Spesifik (SPLD)(KPM,2000). Oleh sebab itu, satu bentuk pendidikan baharu direka bagi menampung permasalahan ketika belajar iaitu Pendidikan Khas. Dalam konteks ini, kanak-kanak Sindrom Down diberi peluang sama rata untuk belajar memandangkan kanak-kanak ini masih lagi mampu berfikir dan menerima pembelajaran baharu dalam bentuk bimbingan yang khusus. Kanak-kanak yang mengalami masalah ini perlu juga diberikan satu pendidikan yang bersesuaian dengan masalah mereka dan bukannya ditempatkan dalam kalangan kanak-kanak biasa memandangkan tahap kognitif mereka agak berbeza dan memerlukan bimbingan.

2.0 OBJEKTIF KAJIAN

Kajian ini bertujuan mengetahui persepsi dan pengalaman guru yang mengajar di kelas pendidikan khas Sindrom Down mengenai kanak-kanak ini dengan lebih lanjut.

Secara khususnya kajian ini menyiasat perkara yang berikut:.,
1) masalah yang dihadapi oleh kanak-kanak Sindrom Down 2) kaedah yang digunakan bagi mengatasi masalah tersebut, 3) Kaedah yang digunakan bagi mengajar pelajar kanak-kanak Sindrom Down 4) Kaedah yang digunakan ketika mengajar matematik

3.0 PENYATAAN MASALAH

Kanak-kanak Sindrom Down sebenarnya mempunyai kemahiran yang baik dalam menguruskan diri selepas pendedahan dan bantuan dalam menguruskan diri berjaya dibentuk. Ini menunjukkan bahawa kanak-kanak ini mempunyai kemahiran yang baik setelah dibentuk (Suraya Bai,2000). Namun begitu apabila menyentuh berkaitan dengan kemahiran kognitif mereka pula menunjukkan bahawa

tumpuan mereka adalah rendah dan perkembangan mental yang lambat. Perkembangan 'Intelligent Quotient' (IQ) mereka adalah antara 35 dan 70, dengan purata sebanyak 55 (Nor Asri Jani,2007). Ini menunjukkan bahawa kanak-kanak Sindrom Down sukar untuk berfikir dengan baik dan juga lembab. Maklumat yang diberikan sukar untuk diproses bagi membentuk pemahaman dan juga ingatan jangka panjang (Lewis, 1987). Mereka ini memerlukan bimbingan khusus sama ada daripada tenaga pengajar sendiri ataupun melalui persekitaran yang sesuai.

Masalah kemahiran berfikir ini telah mereka alami sejak daripada kecil lagi (Bird dan Buckey, 1994). Jika masalah ini tidak diatasi dan juga tidak dirawat, kanak-kanak Sindrom Down akan terdedah kepada pelbagai masalah lain lagi seperti pertuturan, tumpuan yang singkat, masalah tingkah laku, masalah kefahaman dan sebagainya (Learning Disabilities Association of America, 2001). Bagi mengatasi masalah ini, pelbagai inisiatif perlu diambil untuk membantu kanak-kanak Sindrom Down.

Tahap penguasaan antara kanak-kanak Sindrom Down adalah berbeza. Kanak-kanak ini memerlukan jumlah masa yang lama dan berbeza antara sesama mereka dalam mempelajari dan menguasai operasi-operasi serta kaedah-kaedah dalam matematik (Nor Asri Jani,2007). Namun ini bukan bererti mereka masih gagal menguasai matematik (Khadijah Ishak, 2010). Kecacatan yang dialami oleh kanak-kanak ini membataskan tahap penguasaan mereka. Mereka memerlukan bimbingan dan masa yang panjang serta penjelasan dalam bentuk satu persatu (Lewis, 1987). Kaedah pembelajaran mereka ni tidaklah sama seperti kanak-kanak normal malahan adalah tidak sesuai sekiranya mereka ditempatkan di dalam kelas yang sama dengan kanak-kanak normal.

4.0 KAJIAN LITERATURE

4.1 Sindrom Down

Kehidupan yang sempurna sering diimpikan oleh semua orang. Begitu juga dengan harapan ibu bapa yang inginkan anak sempurna dari segi fizikal dan mental. Namun keadaan sebaliknya apabila anak yang dianugerahkan memiliki masalah Sindrom Down. Menurut Profesor Madya Dr. Sharifah Zainiyah Syed Yahya iaitu presiden Persatuan Sindrom Down Malaysia menyatakan bahawa rata-rata ibu bapa yang memiliki anak istimewa ini pada mulanya kelihatan keliru dan celaru. Mereka juga kelihatan kecewa dan marah. Namun begitu reaksi ini semakin pudar setelah ikatan kasih sayang terbina antara ibu bapa dan anak Sindrom Down. Sindrom Down merupakan satu kecacatan genetik yang tidak boleh diubati. Sindrom Down ini bukanlah sesuatu jenis penyakit keturunan ataupun baka yang diwariskan daripada satu generasi kepada satu generasi. Masalah Sindrom Down ini berlaku pada setiap 800 kelahiran (Steele, 1996; Stoll, Alembik, Dott dan Roth, 1990; Hassold dan Jacobs, 1984). Sindrom Down merupakan kecacatan kromosom bercirikan bahan genetik salinan tambahan pada kromosom 21 sama ada melibatkan keseluruhan kromosom ataupun sebahagian (Kumin, 2003). Kesan salinan ini mempunyai perbezaan jelas antara individu dan keadaan ini bergantung kepada tahap salinan tambahan, latar belakang genetik, faktor persekitaran dan juga peluang secara rawak (Fidler, Hodapp dan Dykens, 2002; Fidler, Lawson dan Hodapp, 2003; Hodapp dan Fidler, 1999).

Sindrom Down merupakan satu keadaan masalah dalam perkembangan fizikal dan mental yang berpunca daripada keadaan abnormal perkembangan kromosom. Kromosom ini terbentuk akibat kegagalan sepasang kromosom untuk saling memisah ketika proses pembelahan (Penang Down Syndrome Association, 2008). Pemisahan kromosom ini berlaku bukanlah disebabkan oleh kecacatan yang dimiliki oleh ibu terbabit. Masalah pemisahan ini berlaku secara spontan ataupun secara tiba-tiba. Tiada rawatan yang boleh dilakukan supaya pemisahan ini dapat dibaiki semula.

Menurut JW Chaplin (1995) Sindrom Down merupakan satu masalah ataupun cacat melibatkan fizikal yang disertai oleh masalah mental, lidahnya yang tebal, retak ataupun terbelah, wajahnya mendatar dan matanya yang sepet. Bagi Kartini dan Gulo (1987) Sindrom Down merupakan satu keadaan disebabkan oleh pertambahan kromosom. IQ kanak-kanak Sindrom Down biasanya di bawah 50 (Nor Asri Jani,2007). Sifat dan ciri-ciri kanak-kanak ini adalah berbeza dengan kanak-kanak normal malahan bentuk fizikal kanak-kanak Sindrom Down ini adalah sangat ketara dan mudah untuk dikenalpasti.

4.2 Pendidikan Pra Sekolah

Pendidikan awal merupakan satu bentuk pembelajaran yang baik kepada kanak-kanak. Dalam konteks pembelajaran Sindrom Down, kanak-kanak akan diajar untuk bertutur dahulu sebagai permulaan dalam pendidikan (Zuriahwati Mat Mini,2012). Kebanyakan kanak-kanak Sindrom Down mengalami masalah dalam pertuturan (Sigman dan Ruskin, 1999). Pertuturan yang betul merupakan asas dalam komunikasi bagi memudahkan interaksi antara pengajar dengan kanak-kanak Sindrom Down. Penggunaan alat artikulasi yang dipilih adalah bersesuaian dengan masalah kanak-kanak ini. Sebagai permulaan, kanak-kanak ini akan diajar mengeluarkan bunyi dari peti suara mereka menggunakan huruf yang mudah untuk disebut dan dalam suasana permainan yang santai (Kumin,2003; Napoli, Kilbride dan Tebbs,1996). Kanak-akank Sindrom Down memerlukan satu suasana yang baik memandangkan mereka ini mudah berubah emosi.

Bentuk komunikasi memainkan peranan penting dalam proses pembelajaran kanak-kanak Sindrom Down (Sigman dan Ruskin, 1999). Pada peringkat ini, guru perlu banyakkkan bercakap dalam nada yang tersusun supaya mudah untuk dipelajari oleh kanak-kanak Sindrom Down. Dalam komunikasi antara guru dan pelajar, guru bukan sahaja memainkan peranan dengan bertutur malahan

perlu memainkan mimik muka, pergerakan badan dan juga pandangan mata (Kumin, 2003; Littlejohn dan Foss, 2008).

Menurut Suraya Bai (2012) dalam kajian kes beliau mengenai kanak-kanak Sindrom Down mendapati bahawa kaedah pengajaran dan pembelajaran bagi kanak-kanak Sindrom Down ini perlulah pelbagai iaitu tidak boleh tertumpu kepada satu kaedah sahaja. Ini adalah kerana kanak-kanak ini mudah jemu dan cepat bosan sekiranya diberikan satu bentuk kaedah. Guru pembimbing perlulah mahir dengan konsep pembelajaran sebelum menyampaikan isi pelajaran supaya guru mendapat idea untuk merangka bahan bantu mengajar bagi memudahkan kanak-kanak Sindrom Down ini memahami sesuatu pembelajaran (Kochhar dan West, 1996). Kanak-kanak Sindrom Down walaupun kelihatan cacat dan lemah serta lambat dari segi kognitif dan psikomotor, namun apabila penggunaan bahan bantu mengajar yang pelbagai dapat membantu mereka mempelajari perkara baharu (Wigram dan De Backer, 1999; Wilmot, 2004).

4.3 Pembelajaran Matematik

Dalam pembelajaran bagi kanak-kanak Sindrom Down, pendidikan dalam matematik tidak boleh dilupakan. Pengiraan dan juga nombor adalah sama penting dan perlu dititik beratkan sama seperti pertuturan dan bahasa (Hurford, 1987). Matematik bukan sahaja terletak kepada bentuk pengiraan yang memerlukan penggunaan kognitif yang tinggi malahan dalam matematik juga terdapat bahasa matematik yang mudah untuk difahami dan dihafal (Dehaene, 1992). Kanak-kanak Sindrom Down ini mengalami masalah dalam pembelajaran matematik kerana mereka sukar untuk mengenal nombor. Malahan ada juga antara mereka ini yang menghafal nombor tetapi dalam aturan yang bercelaru (Klahr dan Wallace, 1973). Keadaan ini menyukarkan mereka untuk menjalankan operasi dalam matematik seperti tambah dan tolak. Oleh sebab itu, guru tersebut perlu membantu mereka mengenal nombor dan

menghafal nombor tersebut secara perlahan-lahan dan dalam suasana pembelajaran yang santai (Nordin Tahir,2010). Guru juga tidak boleh berputus asa memandangkan kanak-kanak ini mudah lupa dan mudah juga berubah emosi (Romi dan Leyser,2006). Guru-guru perlu banyakan bersabar dan kreatif dalam membina bahan bantu mengajar.

Sebagai permulaan, Nordin Tahir (2010) menyarankan guru-guru mengajar kanak-kanak ini mengingati perkara-perkara yang mudah. Jadi apabila diperkenalkan dengan sesuatu nombor yang sukar, kanak-kanak ini telah terdidik dalam mengingati bentuk matematik. Guru-guru boleh mengajar mengenal 1 hingga 5 dahulu dan disusuli 6 hingga 10 selepas kanak-kanak itu telah berjaya mengenal dan menghafal nombor. Pada peringkat permulaan agak sukar. Oleh sebab itu, bahan bantu mengajar perlu direka agar pengajaran menjadi mudah dan kanak-kanak Sindrom Down ini tidak mudah jemu (Napoli, Kilbride dan Tebbs,1996) . Pendekatan sama padan juga adalah sesuai kerana kanak-kanak Sindrom Down ini boleh untuk membuat perbezaan (Caycho, Gunn dan Siegal, 1991)

5.0 METODOLGI KAJIAN

Kajian ini telah dilakukan di tiga buah pusat yang menyediakan pendidikan kepada kanak-kanak Sindrom Down di peringkat prasekolah. Pusat tersebut ada dibawah kelolaan kerajaan dan juga bukan kerajaan. Pengkaji memperolehi maklumat berdasarkan kaedah temuduga tidak formal dengan warga pendidik di kelas pendidikan khas. Hanya enam orang guru sahaja yang terlibat dalam kajian ini. Hasil temuduga dicatat bagi menyokong keterangan yang diberikan. Analisis dapatan dilakukan secara manual dan kualitatif.

6.0 HASIL KAJIAN

6.1 Profil Demografi

Kajian ini meliputi responden seramai enam orang. Kesemua responden adalah perempuan. Majoriti responden (80%) dalam kajian ini berumur dalam lingkungan 20 hingga 40 tahun. Hanya seorang responden (20%) yang berumur lebih daripada 40 tahun.

6.1 Kefahaman responden mengenai Sindrom Down dan ciri-ciri pelajar Sindrom Down

Dua daripada responden (G1 dan G2) menyatakan bahawa Sindrom Down ialah istilah yang digunakan bagi pelajar yang mempunyai masalah kecacatan dalam bentuk fizikal dan mental sehingga mereka mengalami kesukaran dalam menguruskan kehidupan. G3 dan G4 menyatakan bahawa kanak-kanak Sindrom Down ini mengalami masalah terencat akal yang tidak kronik. Mereka memerlukan bimbingan yang khas daripada seseorang. G5 dan G6 pula menyatakan bahawa pelajar Sindrom Down ialah pelajar pendidikan khas iaitu mereka berhak untuk menikmati pendidikan sama seperti kanak-kanak normal namun mereka memerlukan bimbingan dan rawatan fisio sebelum mereka benar-benar boleh mengikuti pelajaran berbentuk ilmiah di dalam kelas. Majoriti responden bersetuju bahawa kanak-kanak ini memerlukan pendidikan awal dalam menguruskan diri sendiri sebelum mereka memasuki alam persekolahan.

6.1 Masalah yang dihadapi sebelum sesi pembelajaran

Responden semua bersetuju bahawa masalah utama kanak-kanak Sindrom Down ini ialah mereka masih tidak mampu menguruskan diri ketika kali pertama datang ke pusat. Oleh sebab itu mereka

memerlukan tempoh masa dalam membantu kanak-kanak ini menguruskan diri seperti ke tandas dan makan sendiri.

Menurut G2 keadaan ini membezakan tahap pencapaian murid dan bukannya faktor usia yang mempengaruhi tahap penguasaan pelajar terhadap pembelajaran. Beliau menjelaskan bahawa kanak-kanak yang dihantar ke pusat pada peringkat awal usia iaitu dalam lingkungan empat tahun mudah untuk dibantu dalam pembelajaran akademik berbanding dengan kanak-kanak berusia enam tahun yang baharu dihantar ke pusat. Ini disebabkan tempoh pemulihan dan kemandirian yang lama menjadikan tempoh pembelajaran menjadi lambat.

Responden G4 ada menjelaskan bahawa ibu bapa juga tidak memainkan peranan yang baik. Setelah terapi dijalankan di pusat, ada segelintir ibu bapa yang tidak meneruskan terapi ini di rumah. Ibu bapa memberikan alasan sibuk dengan komitmen lain. Situasi menjadikan tempoh masa pemulihan di pusat menjadi lama berbanding dengan kanak-kanak yang sering dibantu oleh ibu bapa di rumah untuk menjalankan terapi.

Responden G6 ada menambah bahawa ketika sesi pemulihan, ada juga ibu bapa yang sekadar menghantar anak mereka di pusat dan setelah tiga jam akan mengambil semula anak tersebut. Situasi ini mengecewakan kerana keadaan ini tidak akan membantu kanak-kanak tersebut untuk mahir dalam pengurusan diri. G6 mencadangkan supaya sesi kaunseling kerap diberikan kepada ibu bapa agar ibu bapa kanak-kanak Sindrom Down ini lebih bersikap mengambil berat dan memberikan perhatian memandangkan anak mereka merupakan anak istimewa.

6.2 Masalah ketika menghadapi sesi pembelajaran

Semua responden bersetuju bahawa kanak-kanak Sindrom Down ini mudah lupa dan perlu diulang beberapa kali ketika sesi pembelajaran. Adakalanya guru perlu mengajar perkara yang sama berulang sehingga berminggu-minggu. Ini disebabkan kanak-kanak

Sindrom Down mudah lupa dan mereka juga tidak fokus ketika belajar. Guru-guru perlu kreatif memandangkan kanak-kanak ini suka melihat sesuatu yang berwarna dan bergerak. Menurut responden G1, beliau suka menggunakan gambar rajah berwarna dengan warna yang terang dan menarik. Warna yang terang menjadikan kanak-kanak ini kelihatan teruja ketika sesi pembelajaran. Namun apabila warna yang dipaparkan kelihatan suram dan tidak menarik, kanak-kanak ini kurang memberikan respon.

G2 juga menjelaskan bahawa ketika permulaan sesi pembelajaran beliau akan mengajak kanak-kanak ini untuk menari dan menyanyi. Ini adalah untuk membantu kanak-kanak ini mudah mengingat pelajaran yang dipelajari. Walaupun sebenarnya kanak-kanak ini kurang memahami tetapi G2 berharap kaedah ini mampu merangsang kanak-kanak ini untuk bercakap. Muzik yang dimainkan juga perlulah rancak bagi mewujudkan suasana yang gembira.

6.3 Kaedah pengajaran matematik

Matematik yang diajar pada peringkat ini hanya sekadar asas sahaja iaitu mengenal nombor sahaja pada peringkat permulaan. Untuk menggunakan operasi pula mereka memerlukan kaedah pendekatan yang berbeza. Responden G6 mengajar kanak-kanak menggunakan operasi melalui kaedah mudah. Namun begitu beliau menjelaskan adalah sukar memandangkan kanak-kanak ini mudah lupa dan perlu diulang beberapa kali.

Dalam mempelajari matematik, kanak-kanak ini diberikan pendedahan awal untuk mengenal abjad terlebih dahulu. Setelah itu barulah kanak-kanak ini diperkenalkan nombor. G2 suka mengajar kanak-kanak ini mengenal nombor melalui tulisan di tapak tangan. Kanak-kanak ini akan dirangsang deria rasa untuk mencari nombor tersebut pada nombor yang berbentuk timbul. Tempoh masa yang lama menjadikan sesi ini kelihatan hambar. Oleh sebab itu, G2

menyarankan agar bilangan tenaga pengajar di pusat tersebut ditambah lagi.

Menurut G3 keistimewaan kanak-kanak ini ialah mereka tidak pernah jemu untuk belajar. Walaupun pembelajaran mengenal abjad telah mereka pelajari sejak berminggu-minggu mereka tidak ada masalah untuk belajar huruf tersebut pada hari yang lain. G3 juga menambah keadaan ini menjadikan beliau lebih bersemangat untuk membantu kanak-kanak ini memandangkan mereka sentiasa teruja untuk belajar walaupun pembelajaran itu bukanlah pemebelajaran baharu.

7.0 PERBINCANGAN DAN CADANGAN

Sepanjang perbincangan bersama guru-guru mengenai kaedah pengajaran dan pemahaman terhadap Sindrom Down, pengkaji dapat membuat beberapa kesimpulan dan mengemukakan beberapa cadangan untuk menghadapi permasalahan kanak-kanak Sindrom Down ini, antaranya ialah:

7.1 Tahap kemandirian kanak-kanak Sindrom Down yang rendah

Semasa permulaan kanak-kanak ini dibawa kepusat jagaan, kebanyakan kanak-kanak ini dalam lingkungan tiga hingga empat tahu. Pada ketika ini kanak-kanak ini mengalami masalah fizikal pada tahap rendah iaitu ada dalam kalangan kanak-kanak ini yang memiliki otot lembik dan masih lagi gagal menguruskan diri dengan baik. Ada segelintir kanak-kanak ini hanya memakai lampin pakai buang kerana masih lagi tidak pandai mengurus diri ketika ke tandas.

Keadaan ini yang merumitkan tenaga pengajar kerana penumpuan awal terpaksa diberi dalam membantu pelajar untuk menguruskan diri sebelum sesi pembelajaran bermula (Bindal dan Sharma,2010; Kuyini dan Desai, 2008). Menurut Mahmood Nazar

(2000) kanak-kanak ini memiliki keupayaan terbatas dalam mengharungi kehidupan normal. Ini menjadikan kanak-kanak memerlukan bimbingan khas dalam membentuk keperluan harian mereka. Penekanan dalam membantu menguruskan diri seharusnya dilakukan oleh ibu bapa sejak dari kecil lagi (Darrah, Law & Pollack, 2001). Setelah terapi dijalankan, seharusnya ibu bapa meneruskan aktiviti ini di rumah dan bukannya mengharapkan bantuan tenaga pengajar di pusat semata-mata. Jika ibu bapa dapat memberikan kerjasama yang baik, proses pengajaran dan pembelajaran di pusat akan menjadi lebih mudah dan lebih berkesan (D. Orothea, 2012).

7.2 Ingatan yang rendah

Menurut pandangan tenaga pengajar, ingatan kanak-kanak Sindrom Down adalah lemah. Mereka mudah lupa akan sesuatu pelajaran. Guru-guru terpaksa mengulangi pembelajaran sehingga berminggu untuk mengajar satu huruf ataupun nombor. Ini adalah kerana kanak-kanak ini memerlukan masa yang lama dalam mempelajari sesuatu kerana tahap kognitif mereka yang rendah (Judy Barker, 1999).

Namun begitu ada juga dalam kalangan kanak-kanak ini yang cergas dan pantas dalam mengingat sesuatu. Ini menjelaskan bahawa tahap kognitif kanak-kanak ini adalah berbeza walaupun usia yang sama.

Pembelajaran berbantuan muzik sangat membantu. Muzik telah lama digunakan sebagai salah satu bentuk terapi (Schmidt Peters, 2000; Wiagram et al., 2002). Menurut Schmidt-Peters (2000) deria manusia mudah peka apabila mendengar muzik. Keadaan ini membantu kanak-kanak Sindrom Down untuk memberikan tumpuan ketika berada di dalam kelas dan ini akan membantu perkembangan kognitif pelajar (Zatorre et al., 2002).

Dalam satu tinjauan yang telah dijalankan oleh Judy Barker, 1999 menunjukkan bahawa kanak-kanak Sindrom Down yang

didedahkan dengan muzik mudah untuk mempelajari sesuatu. Muzik merupakan satu pendekatan pembelajaran yang baik (Schmidt Peters, 2000; Wigram et al., 2002). Muzik mewujudkan satu suasana yang baik dan pembelajaran menjadi menarik serta seronok. Kanak-kanak Sindrom Down mudah untuk mempelajari pembelajaran menggunakan teknik muzik. Ini adalah kerana kanak-kanak ini tidak menyedari bahawa mereka melakukan pembelajaran berulang (Judy Barker, 1999). Mereka berasa seronok dengan benyanyi dan menyanyi mengikut hati nurani mereka. Kenyataan ini ditambah lagi oleh Grove dan Walker (1990) bahawa dengan nyanyian kanak-kanak akan berasa leka dan gembira ketika menyanyi. Perbezaan frekuensi dalam nyanyian membantu kanak-kanak ini mengingati dengan lebih baik (Kiernan,1983).

Teknik pengulangan perlu dilakukan oleh tenaga pengajar dengan sabar dan tabah (Romi dan Leyser,2006). Malahan tenaga pengajar juga perlu kreatif bagi mewujudkan suasana pembelajaran yang baik dan seterusnya membantu kanak-kanak Sindrom Down untuk mudah mengingati. Teknik pengulangan mudah diamalkan apabila kanak-kanak ini belajar bernyanyi dengan baik.

Melalui permainan juga kanak-kanak ini boleh belajar dengan mudah dan seterusnya mengingati sesuatu dengan lebih baik (Yanhui Pang,2006). Menurut Jordan dan Lifter (2005) perkembangan kanak-kanak dipengaruhi oleh kemahiran dalam bermain. Kanak-kanak yang bermain dengan aktif cenderung untuk belajar dengan lebih baik. Ini adalah kerana permainan merupakan satu kaedah untuk meningkatkan kehidupan kanak-kanak Sindrom Down terhadap persekitaran. Interaksi yang baik dengan persekitaran membantu kanak-kanak ini mengingati sesuatu pembelajaran dengan lebih bagus.

Bagi membentuk persekitaran sosial yang baik, tenaga pengajara juga penting memiliki kemahiran yang tinggi sebelum membantu kanak-kanak Sindrom Down ini (Causton-Theoharis dan Malmgren, 2005). Daripada pemerhatian yang telah dijalankan mendapati bahawa tenaga pengajar di pusat Sindrom Down ini memiliki kemahiran social yang baik. Mereka menunjukkan sikap

ramah mesra dan lemah lembut sama ada kepada pelajar mahupun penyelidik.

7.3 Kepelbagaian bahan bantu mengajar

Menurut Norlia Abd Aziz (2006) gaya pembelajaran yang sesuai dan berkesan jika terus dilaksanakan dapat membantu pelajar menguasai matematik dengan baik. Penggunaan sesuatu bahan dalam pembelajaran memudahkan kanak-kanak mempelajari matematik. Jika penggunaan alatan ataupun bahan bantu mengajar dalam pembelajaran kanak-kanak Sindrom Down untuk mempelajari matematik, tahap penguasaan mereka menjadi lebih cepat dan pantas berbanding pembelajaran berdasarkan bimbingan percakapan dan penglihatan secara 'chalk and talk' (Cook,2004) .

Tenaga pengajar di pusat jagaan juga kelihatan komit dengan tugas mereka. Mereka menggunakan pelbagai kaedah untuk membantu pelajar belajar dengan lebih baik. Peringkat permulaan kanak-kanak ini didedahkan dengan mengenal sesuatu huruf melalui pelbagai deria yang dijalankan serentak iaitu melihat, mendengar, merasa dan bertutur. Bilik darjah disediakan juga adalah menarik untuk membantu pelajar belajar.

Buckey (2000) ada menjelaskan bahawa kanak-kanak Sindrom Down merupakan manusia yang memiliki keupayaan, kekuatan dan kelemahan sama seperti manusia normal. Mereka memerlukan bahan bantu mengajar bagi memudahkan mereka memahami topik perbincangan. Ini adalah kerana kanak-kanak ini memerlukan bahan rangsangan bagi menjadikan mereka tertarik seterusnya memberikan tumpuan ketika pembelajaran (Stocckall dan Gartin, 2002). Bahan yang digunakan perlulah menarik dan melibatkan pelbagai kaedah. Ini adalah kerana kanak-kanak Sindrom Down ini cepat jemu dalam satu aktiviti dan bahan sahaja (Buckey, 2000; Norlia Abd Aziz, 2006).

8.0 KESIMPULAN

Sindrom Down merupakan satu keadaan kesukaran kanak-kanak untuk menjalani kehidupan seperti kanak-kanak normal. Mereka ini mengalami kecacatan sama ada dari segi fizikal mahupun mental. Ini tidak bererti mereka terpinggir daripada masyarakat kerana pelbagai pembentukan pendidikan telah dirangka untuk membantu mereka menjalani kehidupan biasa.

Kanak-kanak Sindrom Down mampu menguruskan kehidupan mereka dengan baik dalam bimbingan daripada luar. Dalam konteks pembelajaran pula mereka ini memerlukan bimbingan khusus dan tidak boleh ditempatkan dalam kalangan kanak-kanak normal. Bimbingan yang berterusan kepada mereka mampu untuk membantu mereka menjalani kehidupan normal.

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RETHINKING THE SUSTAINABILITY OF SERVICE- LEARNING AS A TRANSFORMATIVE PEDAGOGY IN HIGHER EDUCATION

Iqbal Ahmad & Hamdan Said

ABSTRACT

Today's researchers and practitioners seem increasingly concerned about the sustainability of service-learning as an effective transformative community engagement pedagogy. Although service-learning has gained much theoretical popularity as an effective tool to achieve the goals of community development. However, despite of this, the role of service-learning is still unclear that how it will keep its promises and claims as an active community development strategy. The main purpose of this paper is to identify the role of service-learning as a community engagement strategy. Second, to find out it can sustain itself as a transformative pedagogy in higher education and third, to explore a suitable service-learning model that can be used at higher education level to achieve the goals of community engagement. To investigate into this scenario, the paper extensively reviewed and examined the existing literature on service-learning and its role as transformative community engagement pedagogy. As a result of the examination, the paper identified three trends in the current literature related to the above objectives: first, service-learning is being increasingly used for identification and solution of community needs. Second, as a transformative method service-learning focuses service, collaboration and practice as its goals rather than mere

accumulation of theoretical knowledge. Third, as a community development tool, its sustainability is at stake due some barriers such as integration of technology, lack of resources, undefined partnership standards between higher education institutions and communities due to lack of suitable model for developing sustainable links. To solve this problem, the paper advises the higher education institutions to adopt Transformational Reciprocal Model (TRM) for community engagement. This model is more reciprocal and suits the service-learning goals.

Keywords: Service-learning, community engagement, higher education, transformative pedagogy

INTRODUCTION

As an educational approach one of the unique features of service-learning is reciprocity. It has a positive influence on the community receiving services and the educational institutions hosting those programmes as well as students getting benefits for social, moral and civic development (Billig, 2009; White, 2001). Service-learning is defined as a teaching and learning strategy that connects community service with academic curriculum (Learn and Serve America, 2010). Despite the popularity of service-learning it is still unclear that what students and community outcomes are closely associated with service-learning and what factors are related to effect community engagement and citizenship development of students and the selection of a more effective model (Celio, Durlak & Dymnicki, 2011). This review focuses on these issues. An increasing amount of research is consistently reminding the higher education institutions about their citizenship mission and community engagement goals. Research has indicated service-learning to be an effective community engagement method (Varolta, 1997; Furco, 2002; Ellison & Eatman, 2008; Butin, 2010). This trend has motivated higher education institutions to

revisit, redefine and rethink their community engagement goals (Eyler, 2000). This trend can be seen around the world, for example, in 1990 the National and Community Service Act was enacted in the United States to increase civic participation in higher education. Later on, in 1993, the Corporation for National and Community Service was formed to mobilize Americans for community service. Later on, the citizenship education was formally conceptualized in Great Britain by passing the crick report on citizenship education and its importance (Lucas, 1996; Bryant *et al.*, 2011). Over the last two decades, service-learning has earned a unique reputation as effective community engagement and citizenship development pedagogy (Zlotowski, 1995; Furco, 2002; Melchior, 2000; Butin 2010; Bryant et al., 2011). In view of many scholars, it has successfully bridged the long prevailing gap between theory and practice of traditional mode of teaching and learning in higher education (Rhoads, 1997; Antonio, Astin & Cross, 2000). One of the major contributions of service-learning is the linking of academic content with community service within a framework of respect, reciprocity, relevance and reflection (Liu, 1995; Billig, 2004). Some writers have called this a transformative movement in education, because it successfully integrates academic learning with community experience and develops students' academic skills, cultural competence along with fostering their knowledge about a just and an inclusive world (Morgan & Streb, 2001).

Service-learning has also achieved the status of standard bearer for civic renewal and community engagement (Butin, 2005; Berle, 2006). This is a wonderful affirmation of the progress of service-learning as an engaged pedagogy (Bell, Furco, Ammon, Muller & Sorgen 2000). Scholars have declared it a real transformative pedagogy due to its typical nature of linking classrooms with the real world and communities (Colbeckv & Michael, 2006; Harkavy, 2006). According to some writers higher education institutions has realized the potential of service-learning for creating sustainable partnerships with local communities and a strongest predictor of students' academic development (Furco,

2002; Butin, 2005). The current higher education institutions prefer to adopt collaborative approaches, learning models and institutionalized practices as techniques for effective teaching and learning. As a transformative learning approach, service-learning potentially achieves this goal. As a collaborative practice service-learning allow higher education institutions to expand their practices and priorities beyond the traditional boulder walls. The service activities can be effectively aligned with collaborative community practices (Hartley, Harkavy & Bensen, 2005).

Currently service-learning has strongly positioned itself in higher education as transformational community based learning approach (Lindholm, 2005). There are more than one thousand postsecondary memberships of campus compact committed to community service, civic engagement and service-learning in higher education around the world (Hartley, Harkavy, & Bensen, 2005). An enormous research has suggested that service-learning is a highly useful pedagogical intervention for promoting a wider range of outcome variables such as academic achievements, civic engagement, and diversity attitude and so on (Jones, Gilbride-Brown & Gasorki, 2005). Service-learning practice has become a recognized marker in higher education. Due to this, it has attracted the attention of scholars, practitioners and students from multiple disciplines of higher education towards its exciting pedagogical promises (Butin, 2006; Driscoll, 2008). This has triggered a debate in the circles of scholars in higher education regarding the issues of its limits and promises. Rather than attempting its merits, researchers have shifted their focus from modes and means to conduct service-learning to treating it mere an academic methodology in higher education (Hartley et al., 2005). Moreover, many researchers have called for more public participatory scholarship in further extension of the Boyers' call for 'scholarship of engagement' in higher education which is academically rigorous, engaged, useful and responsive (Colby *et al.*, 2007; Ramaley, 2006).

This paper informs that unlike the traditional practices in

higher education where the emphasis was on accumulation of knowledge from teachers and text books, service-learning is turning its attention to new dimensions in education such as collaboration, engagement and partnership where the focus is on sharing of knowledge, its application and creation as a result of new experience. This paper investigates into the role of service-learning as a collaborative community engagement paradigm (Jones, Gilbride-Brown, & Gasorki, 2005). Scholars have attempted to find answers to these from various perspectives. In the backdrop of this, although, previous studies have extensively explored the outcomes perspective of service-learning, very few studies have ventured into the conceptualization of service-learning from its technical perspective as transformative community engagement pedagogy in higher education (Mitchell, 2007). This paper specifically attempts to explore the transformative aspect of service-learning in higher education and explains its conceptualization from this perspective.

RETHINKING SERVICE-LEARNING

Over the last three decades, a critical movement has occurred in the lives of local and global communities due to the rapid industrialization, democratization, marketization and globalization trends around the world (O'Grady, 2000; Paul, 2006). All these developments have posed some new limitations and possibilities to higher education and to the communities. This has caused a fundamental rethinking among researchers, scholars, and practitioners about the values and mission of higher education. The trend has further created anxiety among the scholars about the renewed goals and role of higher education regarding the public good and community development (Kirp, 2003; Kezar et al., 2005; Zemsky et al., 2005; Colby et al., 2007; Bensen et al., 2007). This rethinking has further intensified due to increasingly decreasing position of traditional higher education in meeting the fast increasing social needs of people in different parts of the world

(Pompa, 2002). Hence, People, communities, stakeholders, and practitioners alike have been questioning the ability of the traditional higher education to deliver effectively to the increased needs in the current times (Pompa, 2005).

On the other side, there is a general expectation among all the stakeholders regarding the increasing weaknesses in the existing higher education practices to develop required abilities and capabilities among the students. The general allegations on the traditional higher education are its inability to develop among students high sense of inquiry, critical thinking, civic engagement and social responsibility (AAC&U, 2007; Vaughn & Seifer, 2008). Side by side, the rapid expansion in service-learning in the last decade has created many questions about its ability to sustain the pressures of higher education and its challenges. In this regard, scholars ask many questions (Young *et al.*, 2007). For example, first, whether the traditional higher education is in a position to deal with the current challenges that have affected communities around the world. Secondly, how effectively the current higher education has responded effectively to the ever increasing diverse needs of the communities due to globalization and its implications in varying forms (Kezar, Chambers, & Burkhardt 2005). Studies have argued that the service-learning as social-moment has long been tested and found not suffice for rectifying the increasing diverse needs of communities and inform the complexities and problems of higher education in the current times (Hogan, 2002; Schutz, 2006; Head, 2007; Swaminathan, 2007).

PROMISES OF SERVICE-LEARNING

Literature has provided three reasons for the need of this rethinking in service-learning as a transformative pedagogy in higher education. First, the current practices and strategies in higher education are guided by the old assumptions still carried by the teachers, students and communities alike that its role is to produce

scholars for the community who have ‘knowledge of the world’. Second, there is new desire on the part of practitioners to develop more engaged and transformative pedagogical model to deal with the expectations and multidimensional needs of the communities characterized by rapid social, political and cultural trends and values. Third, if service-learning did not effectively grapple with its own technical issues, there is likelihood that the gap would be filled by others. For example, there is a deeper ongoing debate about the need of intellectual diversity in higher education. It is believed that the existing traditional mode of higher education promotes only indoctrination for citizenship rather than educational development (Borden, 2007). Other researchers argue that service-learning being a transformative engaged pedagogy has the potential to bridge this gap in theory and practice of higher education. Some even argue that service-learning is a powerful form of experiential pedagogy that can lead to creating more effective linkages between higher education and the communities (Baldwin et al., 2007; Paoletti, 2007).

Currently, more than 500 leaders in US higher education institutions have signed the President Declaration on the Civic Responsibility of Higher Education. The basic purpose of this movement is to reinvigorate and highlight the civic mission of higher education (Campus Compact, 2005). Service-learning was primarily valued for its traditional role for promoting students’ better understanding of theoretical concepts. However, more recently, it was realized that it can also offer other important benefits as well such as enabling students to explore connecting classroom theory to practical needs of the community in real life situations. This helps reinforce students’ critical thinking, communication, and teamwork skills. The most vital long term benefit of service-learning is providing students a handy opportunity to connect to community and identify their civic roles (Campus Compact, 2003; Bryant *et al.*, 2011).

LIMITS OF SERVICE-LEARNING

The above mentioned benefits of service-learning have attracted the attention of researchers and practitioners towards it. Despite of these benefits, scholars have faced many limitations. For example, constructing and implementing service-learning is a time consuming and daunting task to be achieved in higher education. But, research has revealed that these limitations can be overcome by searching out new possibilities. One such possibility is following specific approaches within the theory of service-learning (Bryant *et al.*, 2011). For example, ‘course portfolio’ can be used as one of such pedagogical model to record the reflections of students during the service activity for meeting the above mentioned needs. Reflection is a critical element of service-learning. Through reflection students understand the deeper connections between the theory and practice of education. This further leads to deeper understanding of the course as well as the community needs. This combination of service and learning provides a sound basis for the development of both students and community equally (Honnet-Porter & Poulson, 1989; Eyster & Giles, 1999; Bryant *et al.*, 2011).

Within the framework provided by Bernstein, Burnett, Goodburn and Savory (2006), course portfolios can be used for a variety of academic purposes in higher education such as promotions, tenure decisions, course design and assessment, as well as a foundation for more wider enquiries into the effectiveness of pedagogical approaches (Lindholm, Szelenyi, Hurtado, & Korn, 2005). Typically, the course portfolios are portioned into four parts: (1) profile of course and students, (2) statement of learning goals, (3) methods and approaches to be used, and (4) evidence of success or failure of the approaches in meeting the set instructional goals of the specific course (Bernstein *et al.*, 2006). Basically, the rationale behind the selection of model and instructional choice and the various notions of teaching and learning plays a key role in developing examples for successful community engagement interventions. It must be kept in mind that presenting one example

is not going to be effective (Bryant *et al.*, 2006; Bensenet *al.*, 2007; Wade, 2007).

On the basis of the above discussion, it can be argued here that there is a need to explore a multi-disciplinary model for implementing service-learning at higher education. The nature of service-learning as a multi-disciplinary approach also supports this notion. This would make it possible to develop a multi-disciplinary model that can meet the needs other multi-cultural communities in other contexts. In a service-learning process, experience and reflection plays a central role in learning. As a result of service experience, students have improved comprehension of course material, higher order thinking and critical examination of problems and issues and a deeper sense of community engagement (Markus, Howard & King, 1993). To find answer to these notions, we should re-visit and rethink the very nature of service-learning whether it is pedagogy or a philosophy. Can it change a community? Can it transform a classroom from more theocratic to practical? What are the limits of service-learning in this regard? Literature on service-learning has attempted to answer these questions in different ways. However, the standard argument is that service-learning pedagogy nullifies and rejects the 'Banking Model' of education which emphasizes on theory at the cost of practice. In this model the transformation takes place in the shape of transferring knowledge from teacher to students. It does not allow the students to critically think on the new knowledge. Thus the result of this model is development of 'passive mind' instead of 'active mind' which is the main goal of service-learning (Astinet *al.*, 1999; Butin, 2010).

On the other hand, some writers consider it as a means of re-engaging today's students with academics and civic values for polishing their skills to become an active community member (Colby *et al.*, 2007). Many service-learning advocates have pointed towards some other benefits attached with service-learning in all three domains of education: cognitive, affective and psychomotor. For example, Bensenet *al.* (2007) found that service-learning fosters a more active citizenry. In the same way, Astinet *al.* (1999)

argued that it truly promotes scholarship of engagement that supports a more equitable society and achieves the goals of social justice. More importantly, Wade (2007) posited that service-learning as a reciprocal approach is ideal to connect colleges and universities with the communities for promotion of mutual interests and meeting their diverse needs by emphasizing real world learning and creating a natural relationship between all the stakeholders in higher education. Despite the recent proliferation of research on the merits of service-learning as a community based approach toward education, there are many challenges to its expansion in theory and practice (Butin, 2010). For example, there is still an ambiguity about the basic principles and goals in service-learning. In this regard, the main question is whether service-learning is a pedagogical approach for better course comprehension or merely a philosophical stance to elevate community cause? Even some critics have gone to extent that it is a voyeuristic exploitation of cultures and communities (McKnight, 1998; Cross, 2005). All these perspectives provide more grounds for sound discussion on the true nature of service-learning as a community based pedagogical paradigm.

SERVICE-LEARNING AS A TRANSFORMATIVE PEDAGOGY

What is service-learning? It is very difficult to find one answer to this question. There are many answers in literature to define and delimit service-learning. However, one of the commonly held definition is service-learning is a course based, credit bearing educational experience in which students enables the students to participate in an organized service activity on the basis of which community needs are identified and satisfied. Students reflect on the service activities that enable them to develop deeper understanding of the course content and development of civic maturity (Bringle & Hatcher, 1995). This definition shows that service-learning is a

unique pedagogy as compared to other traditional modes of education. It basically creates a meaningful link between learning and service. This aspect is absent in other approaches such as lecture, discussion or other instructional methods used in higher education. The argument based on this understanding is that service-learning is an active learning model (Sigmon, 1994; Furco, 1996).

Irrespective of the definitional complexities attached with service-learning, scholars have argued that it is a legitimate, ethical and useful pedagogy for promoting the cause of higher education (Buitn, 2010). Others have characterized with the '4 Rs' such as respect, reciprocity, reflect and relevance (Sigmon, 1979; Campus Compact, 2000). Similarly, the service must benefit all the stakeholders who participate in it and also the service must be relevant to the content of the course. There are other conceptualizations of service-learning. For example, earlier Kendall (1990) differentiated between service-learning as a pedagogy to deliver a specific content, and a philosophy as a specific world view that permeates curriculum, strategies, and course assessment at different levels of education. Conversely, Lisman (1998) has declared volunteerism, consumerism, participatory democracy and social transformation as different modes of service-learning, each mode having a different impact on individuals and communities in varying degrees. Other researchers (Morton, 1995; Liu, 1995) have opposed such dichotomization in service-learning discipline. They argue that these modes of service-learning basically are collectively useful for providing valuable service to the community and increased academic learning for students at higher education level. These perspectives provide a useful heuristics for further understanding the different forms of service-learning in different disciplines (Howard, 2000; Butin, 2010). Yet, there are several distinct problems associated with the traditional articulations of service-learning such as unsupportable ethical foundationalism and teleological considerations. There are many questions to be answered. Should students in the service-learning be paid for their

service? Should students engaged in the community provide service only to the poor or to the rich as well (Young, Shinaar, Ackerman, Carruthers & Young, 2007).

The common answer to the above mentioned question is typically grounded in the notion that all individuals are independent change agents who bring about positive and sustained transformations through their own worldviews. Service-learning creates a balance between the traditional and modern worldview as a result of which everyone gets benefits who participate in the process of community service (Butin, 2010). It is believed that service-learning is such a pedagogy through which the process and outcomes benefits are equally shared by all those who participate in it. However, there are stories which tell the opposite. For example, it becomes even more problematic when certain types of questions are made public such as what actual learning is documented as a result of service? There are apprehensions that service-learning may be useful for those who perform the actual service, but still there is still less evidence that it has much benefited the recipients of the service (Kumashiro. 2000; Campus Compact, 2003; Butin, 2010). Despite of these charges, literature has provided ample evidences about the benefits and transformational potential of service-learning as a pedagogical strategy (Eyler& Giles, 1999; Rosenberger, 2000; Jones, 2002).

CONCLUSIONS

Analysis of literature revealed that service-learning is emerging as an incremental and transformational strategy in higher education. This situation calls upon the higher education institutions for applying a disciplined approach towards the theory and practice of service-learning. In this regard, the paper advises the higher education institutions for integrating service-learning in a disciplinary home such as community studies. The paper further informs that there is no single and binary model through which

service-learning could be carried out for community engagement. Different communities have different needs. These needs define the philosophy of the interventions to be made. Hence, service-learning may be looked from multi-perspectives rather than a single perspective approach for community engagement. The study interestingly found that service-learning is a set of theories rooted in the experiential education. Hence it is a social transformation movement rather than mere a curriculum tool to enhance academic goals of a particular discipline in higher education. Last but not least, the study concludes that service-learning and community engagement are useful in developing a model of an ‘engaged university’ which is committed to true public engagement by using community as a laboratory for civic renewal. Finally, the paper suggests using the transformational reciprocal model of service-learning at higher education. This model encompasses the principles of reciprocity, collaboration, engagement and service rather than mere accumulation or promotion of knowledge.

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THE INFLUENCE OF THE HEADS OF SCHOOLS' LEADERSHIP APPROACHES TOWARDS THE EFFECTIVE MANAGEMENT OF MARA INSTITUTIONS OF EDUCATION (MIOE)

Raihana binti Abd Rahim & Khadijah bt Daud

ABSTRACT

The main purpose of this mixed method study is to help building the most effective leadership model to use at MARA Institutions of Education (MIOE). The study is based on the feedback of 2,880 participating MIOEs' staffs that randomly selected from 104 of MIOE and also 8 to 15 of heads of school that was purposively selected from 104 of MIOEs' heads of school all over Malaysia. Descriptive statistical analysis is done first with the application of Leadership Orientation Questionnaire by Bolman & Deal (1991) and The Standard Practice 4 from MARA Education Quality System, MEQS (2009 & 2014). The quantitative data then processed using Statistical Packages for Sosial Science (SPSS) and multiple regressions are adopted to determine the contribution of the heads of schools' leadership approaches towards the effective management of the MIOE. In addition, the qualitative data analysis which is the second part of the study will derived data from open interviews technique and the data is processed by translating and coding the data into words documents. This study is still a concept paper and will be run after researcher achieves research approval by university in the near future.

Keywords: leadership, management, MARA

INTRODUCTIONS

MARA Institutions of Education (MioE) are educational institutions that placed under the management of The Education Sector which is one of the four main sectors that are managed by Majlis Amanah Rakyat (MARA). The other three sectors are The Entrepreneurship Sector, The Management Service Sector and The Investment Sector. With the total of 104 of MioE all over Malaysia, The Education Sector of MARA is the largest manager of educational institutions in Malaysia that offer the broadest range of educational services that included a various types and level of education which ranging from the secondary education institutions (MARA Junior Science College, MJSC) until the higher education institutions (University Kuala Lumpur, UniKL).

Majlis Amanah Rakyat (MARA) as one of the major player in the education sector in Malaysia always shows great sensitivity towards the needs of their customers (educators, students, parents/guardians) in the education market and also the need of the industry representative (factories, companies, organizations) in the job/labour market. The level of sensitivity that was shown by MARA is an effort to make sure that the educational services that MARA offered and the education products that MARA produced are stay relevant and will satisfies the needs of both the customers and the industries. This effort is match the corporate vision of MARA which is “To become a trusted organization that superior and blessed in order to uplift the nation dignity” (MARA, 1966).

The importance of controlling the quality of the education in MioE are crucial because higher quality of education will impact the individual income, help the country economic growth and development, positive changes in social status and increases the number of higher skills individuals whose possess leadership talent (UNESCO, 2005; Centre for Global Development, CGD, 2002 and Carroll & Scherer, 2008). Producing a higher quality of education is crucial but in order to achieve that level of quality, the schools

need to appoint the right person to act as the heads of school since the heads of school leadership is one of the main reason that influence school success (Grissom & Loeb, 2011; Tondeur, 2008 & Syarwani, 2012).

In MARA Institutions of Education (MioE), the heads of school are acting as the school leaders that work the whole school (MioE) towards changes and success achievement. School leaders are someone with a high knowledge, skilful in managing and possess great leadership (Yusuf, 2008). Meanwhile, Moore & Rudd (2005) mentions that an organization leader generally: i) Own skills such as technical, conceptual, human resource and communication, ii) Emotionally intelligent and iii) High knowledge about the industry. Meanwhile according to Bolman & Deal (1991), a great leader is someone that can approach a certain situation or issue in the organization with a more suitable leadership approach since each organization are unique, complex, unpredictable and ambiguous. For leaders, the leadership approaches (frames) can act as a mental map (guidance) in order to help them to go through or avoid any challenges, barriers or uncertain things in their organization (Bolman & Deal, 1997).

The heads of school in MioE are also considered as a great leader when they are able to fit with their management role just like being stated in their desk file and portfolio. The Ken Blanchard Companies (2007) and Beatriz *et al.* (2008) state that their ability to understand about organization management is one of the characteristic of a great leader. Nevertheless, as for the head of school (principals, headmasters, head teachers, rectors, school directors, etc), management also one of the most crucial skills that they need to have in order for them to perform their job as the head (leader) of any schools everywhere in the world (Lunenburg, 2010 & Beatriz *et al.*, 2008). By effectively managed schools as a moving and working organisation, the byproducts that will be produces are the students' development and academic achievement (Jacob & Rockoff, 2011; Grissom & Loeb, 2009 & Abdikadir, 2013).

The goals of MIOE are to become the educational institutions that provide a global and a higher quality of educational services. These goals can be achieved if MARA prepares a suitable platform for the MIOE to expand and grow. The leadership approaches of the heads of school in MARA Institutions of Education (MIOE) is a crucial for every heads of school to understand because it will definitely help the head of school make a detail future planning, leading the MIOE staffs with a proper leadership approaches, practice an effective management and also create changes by changes in the leadership aspect as an effort to absorb pressure and to create success towards the progress of MARA Institutions of Education (MIOE) and the Majlis Amanah Rakyat (MARA) for the near future.

RESEARCH QUESTIONS

The following research questions were designed for this study:

- a) What is the most dominant leadership approach that being use by the heads of school of MARA Institutions of Education (MIOE) based on the perception of the MIOEs' staffs and how does the heads of school of MARA Institution of Education (MIOE) practice each of the leadership approaches (structural, human resource, politic and symbolic) in MIOE?
- b) What are the difference of the heads of schools' leadership approaches according to their background factors such as gender, age, working experience in MIOE, level of education, types of MIOE and years of working at current MIOE based on the perceptions of the MIOEs' heads of school?
- c) What is the level of management effectiveness at MARA Institution of Education (MIOE) based on the perception of the MIOEs' staff?
- d) Which of the heads of schools' leadership approaches (structural, human resource, politic and symbolic) that

- contribute towards the effective management at MARA Institution of Education (MIOE)?
- e) What leadership model that's most effective to use at MARA Institution of Education (MIOE)?

METHODOLOGY

In this study, Mixed Method – The Explanatory Sequential Design: Follow Up Explanation Model by Creswell (2006) and Creswell & Plano (2007) is used as the research design in order to answer the research questions. Therefore the study can be divide into two parts which are for the first part of the study (quantitative), the researcher wills use two questionnaires which are: i) Bolman & Deal (1991) – Leadership Orientation Questionnaire and ii) The Standard Practice 4 from MARA Education Quality System, MEQS (2009 & 2014). Furthermore, for the quantitative data analysis, the researcher will use Statistical Packages for Sosial Science (SPSS) to analyse all data from the instruments. For the second part of the study (qualitative), the researcher will use one of the qualitative techniques of collecting qualitative data which is the open interview and the data from the open interview will be translated, coded and compile in a form of word documents.

For the population in this study, a total of 11,574 of staffs that working/ serving in all 104 of MARA Institution of Education (MIOE) all over Malaysia are involve in the first part of the study (quantitative). But since the number is too large, after doing Random Cluster Sampling and Simple Random Sampling by using Random Number Table, the total number of research sample for this study is 2,880 staff from 95 of MIOE in Malaysia. Meanwhile for the second part of the study (qualitative), the population is all the heads of schools of MIOE in Malaysia which is a total of 104 of heads of schools. To select the research sample, the researcher use Purposive Sampling that based on certain list qualities that will helps researcher to find the most suitable number (approximately

between 8 and 15 heads of school) of research samples that will help researcher to answers the research questions.

All of the methods that use in this study will definitely help the researcher to answer the research questions, therefore brings the researcher even closer to the main purposes of this study which is to build the best leadership model that will most effectively use in MARA Institutions of Education (MIoE).

CONCEPTUAL FRAMEWORK

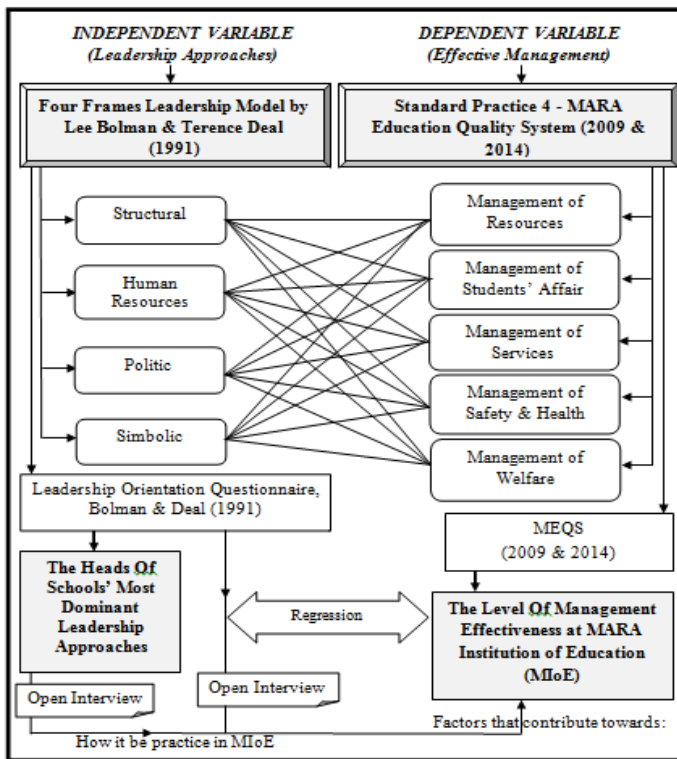


Figure 1: Conceptual Framework Between The Variables of The Study

TIMEFRAME

Table 1: Research Schedule

Time Frame	Actions By Researcher
Feb – June 2014	➤ Finish writing proposal Chapter 1
Sept 2014 – Feb 2015	➤ Finish writing proposal Chapter 2 & 3
Feb – June 2015	➤ Research proposal presentation ➤ Research proposal defence & correction
Sept 2015 – Feb 2016	➤ Pilot study ➤ Data collection
Feb – June 2016	➤ Data analysis
Sept 2016 – Feb 2017	➤ Finish writing Chapter 4 & 5
Feb – June 2017	➤ Finalize thesis
Sept 2017 – Feb 2018	➤ Thesis submission

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AKTIVITI PEMBELAJARAN DALAM PERSEKITARAN AUTENTIK BERDASARKAN KONTINUM PEMIKIRAN VISUALISASI BAGI PEMBENTUKAN INGATAN KERJA KANAK-KANAK SINDROM DOWN

Muhammad Azri Abd Rahim & Noor Azean Atan

ABSTRAK

Penyediaan sebuah persekitaran pembelajaran dengan pengintegrasian bersama pendekatan yang bersesuaian kepada para pelajar haruslah berdasarkan kepada keperluan dan kemampuan mereka dalam mencapai objektif sesebuah pembelajaran. Melalui pengimplementasian sebuah suasana dengan strategi pembelajaran yang baik, mampu membantu dan menyokong kepada pengembangan intelektual seseorang pelajar itu. Namun tidak semua pendekatan pembelajaran yang dikatakan terbaik sesuai di implemenkan dalam sesebuah kelas terutama dalam kalangan kanak-kanak yang mengalami masalah sindrom down. Kanak-kanak sindrom down ini secara umumnya mempunyai beberapa kelemahan secara fizikal mahupun kemahiran berfikir dalam pembelajaran serta mempunyai masalah melakukan sesuatu tugas dengan baik. Kelemahan kanak-kanak ini dalam menerima pendekatan pembelajaran konvensional seperti melalui kaedah verbal iaitu kuliah dan pengajaran dalam kelas biasa dilihat sebagai satu

kesukaran buat mereka ini untuk menerima maklumat dan seterusnya memproses apa yang dipelajari. Pengintegrasian bersama media visual yang realistik dalam sesebuah pembelajaran haruslah secara berperingkat kerana ianya berkait rapat dengan perkembangan tahap visualisasi seseorang pelajar yang secara tidak langsung membantu kepada peningkatan pemahaman mereka. Tahap visualisasi seseorang ini sebenarnya berkembang daripada pemikiran visual kepada pembelajaran visual dan akhir sekali yang tertinggi adalah komunikasi visual yang dikenali sebagai kontinum pemikiran visualisasi. Melalui perkembangan visualisasi ini, ianya menyokong kepada peningkatan ingatan memori kanak-kanak sindrom down berkenaan pembelajaran mereka. Oleh demikian dengan merujuk kepada elemen kontinum pemikiran visualisasi ini serta ciri-ciri pembelajaran dalam persekitaran autentik, maka sebuah apps KIDDO dibangunkan bagi menyokong kepada pembentukan Ingatan Memori kanak-kanak sindrom down ini dari aspek Visuo-Spatial serta Phonological Loop.

Kata Kunci : Persekitaran Pembelajaran Autentik; Kontinum Pemikiran Visualisasi; Ingatan Memori; Sindrom Down

PENGENALAN

Sindrom down terjadi akibat dari penghasilan kromosom manusia yang ke -21 yang didapati tidak normal iaitu 47 kromosom yang menyebabkan berlakunya masalah sindrom down dalam diri seseorang sejak ia dilahirkan (Reynolds, 2010). Menurut Buckley (2000), seseorang yang mengalami sindrom down akan cenderung mengalami pelbagai kompilasi masalah kesihatan yang akan mengganggu perkembangan fizikal serta intelektual mereka seperti masalah pendengaran, leukemia, tiroid, dementia, masalah jantung dan osteoporosis. Melalui aspek pembangunan fizikal mereka, terdapat beberapa ciri-ciri yang dikenalpasti terhadap seseorang yang mengalami masalah sindrom down iaitu mempunyai bentuk muka yang leper, leher yang sedikit pendek dari manusia normal, lidah

pendek, ketinggian yang terganggu dari tahap pembangunan normal, dan terdapat otot dan sendi yang lemah. Disamping itu juga, individu sindrom down menunjukkan kelemahan dari sudut perkembangan intelektual mereka.

Menurut Feng *et al.*, (2010), tahap intelektual yang diperolehi oleh kanak-kanak sindrom down adalah disekitar 40-70 tahap IQ dan mereka juga mempunyai masalah menerima maklumat verbal serta menunjukkan daya ingatan yang lemah. Menurut teori ingatan kerja yang diperkenalkan oleh Baddeley pada tahun 1974 & 2000, memori seseorang akan dipengaruhi oleh dua elemen yang akan membantu daya ingatan seseorang iaitu elemen *visuo-spatial sketchpad* (visual) dan *phonological loop* (verbal). Kajian yang dilakukan oleh Jarrold *et al.*, (2004), individu sindrom down mempunyai kelemahan dalam verbal mereka disebabkan oleh masalah kesihatan dan pendengaran. Masalah verbal ini akan menyebabkan perkembangan tahap intelektual yang diperolehi oleh kanak-kanak sindrom down tidak berada dalam keadaan normal (Brock, 2004). Menurut Feeley *et al.*, (2011) kanak-kanak sindrom down lebih tertumpu kearah pendekatan pembelajaran secara visual dalam menyokong sistem pembelajaran mereka. Ini kerana kanak-kanak sindrom down ini mempunyai memori pendek visual yang sama baik dengan kanak-kanak normal yang lain dan ianya membantu pembelajaran mereka (Duarte *et al.*, 2011).

Berdasarkan kajian lepas yang telah dilakukan kepada kanak-kanak sindrom down berdasarkan kepada pembelajaran visual mendapati, pembelajaran yang berunsurkan bahan bervisual menunjukkan peningkatan kepada perkembangan kanak-kanak sindrom down berbanding kepada penggunaan bahan verbal (Purser & Jarrold, 2005; Smith *et al.*, 2014). Kelemahan masalah verbal mereka dapat disokong dengan pembelajaran secara bervisual. Menurut Roch & Jarrold (2012), penggunaan bahan visual membantu kanak-kanak sindrom down untuk lebih mudah belajar dan membaca. Penekanan kepada kaedah pembelajaran secara bervisual mampu meningkatkan lagi pembelajaran dan meningkatkan daya ingatan mereka (Loveall, 2013). Visual kepada kanak-kanak sindrom down

hendaklah disesuaikan dengan persekitaran mereka agar ianya mudah untuk diimplementasikan ke dalam kehidupan harian mereka. Kanak-kanak istimewa seperti sindrom down perlu didedahkan dengan suasana persekitaran dan masyarakat sekeliling dalam memastikan kaedah penjagaan dan intervensi terhadap mereka dapat membantu dan menyokong perkembangan mereka. Menurut (Roberts *et al.*, 2007; Oliver, 2012), individu sindrom down hendaklah diberikan pendedahan berdasarkan kepada persekitaran umum dan mereka juga perlulah diberikan pembelajaran yang lebih bermakna serta berkualiti. Pembelajaran secara bermakna berdasarkan kepada pendedahan situasi masyarakat sebenar juga dapat membantu kanak-kanak sindrom down dalam meningkatkan keyakinan mereka untuk berhadapan dengan masyarakat sekeliling (Bird *et al.*, 2000; *Down Syndrome Ireland*, 2004; Skotko *et al.*,2011).

Oleh yang demikian, pengimplimentasian bahan bervisual berdasarkan kepada persekitaran autentik sekeliling kanak-kanak sindrom down diperlukan bagi membentuk sebuah pembelajaran yang bermakna buat mereka disamping kepada pembentukan ingatan kerja.

KAJIAN LITERATUR

Kanak-kanak sindrom down menunjukkan beberapa kelemahan secara fizikal mahupun kemahiran berfikir dalam pembelajaran. Mereka juga akan mempunyai masalah dalam melakukan sesuatu tugas dengan baik akibat dari kelemahan mereka alami. Berdasarkan beberapa kajian lepas yang telah dilakukan oleh pengkaji terdahulu, permasalahan yang timbul dalam pembelajaran kanak-kanak sindrom down melalui ingatan pendek verbal mereka yang akan mengganggu perkembangan intelektual mereka agar sama seperti kanak-kanak normal yang seusia dengan mereka (Laws & Bishop, 2004; Jarrold *et al*, 2004; Duarte *et al*, 2011; Ratz, 2013). Menurut *Down Syndrome Victoria* (2009) , hampir kesemua kanak-kanak dan individu sindrom down mempunyai masalah yang serius dalam kemahiran berkomunikasi mereka dan ianya mungkin agak

ketinggalan sebanyak dua ataupun tiga tahun kebelakang dari kemampuan individu normal yang lain. Berikut adalah beberapa kajian lepas yang telah dilakukan oleh pengkaji terdahulu dalam mengenalpasti kelemahan verbal yang dialami oleh individu mahupun kanak-kanak sindrom down.

Bil	Pengkaji	Penggunaan Verbal	Bidang
1.	Lanfranchi, Baddeley, Gathercole & Vianello (2012)	Kemahiran verbal dan visual berdasarkan aktiviti memori	Psikologi
2.	Kittler, Krinsky-McHale & Devenny (2008)	Kemahiran Proses Serentak Antara Verbal dan Visual Berdasarkan Pusat Memori	Psikologi
3.	Lanfranchi, Jerman & Vianello (2009)	Hubungkait kemahiran kognitif verbal dengan keupayaan memori	Kemahiran Kognitif
4.	Campbell, Landry, Russo, Flores, Jacques & Burack (2013)	Keupayaan individu sindrom down dalam menggunakan kaedah fleksibel kognitif berdasarkan bahan verbal dan bukan verbal.	Kemahiran Kognitif
5.	Laws & Bishop (2004)	Kesan kelemahan verbal kepada individu sindrom down	Bahasa
6.	Lee, Pennigton & Keenan (2010)	Pengaplikasian kaedah fonik dan semantik dalam menyokong memori verbal	Psikologi
7.	Frenkel & Bourdin (2009)	Penilaian keupayaan memori verbal, visual dan spatial	Kemahiran kognitif memori

Jadual 1 : Kajian Lepas Tentang Verbal Sindrom Down

Merujuk kepada permasalahan verbal dan kelebihan visual bagi kanak-kanak sindrom down, ia dapat dikaitkan dengan teori ingatan kerja yang telah dinyatakan oleh Baddeley (2000), yang memberikan gambaran kepada pembahagian fungsi otak manusia

dalam mentafsir maklumat dari bahan visual dan verbal. Model ingatan kerja ini merupakan kerangka yang terdapat dalam individu dalam mentafsir maklumat yang mereka perolehi (Baddeley, 2003). Menurut (Baddeley, 2000; Yuan et al., 2006; Alloway & Alloway, 2010) manusia memiliki 3 komponen yang akan membantu kepada proses daya ingatan kerja seseorang iaitu *phonological loop*, *episodic buffer* dan *visuospatial sketchpad*. Ketiga-tiga elemen yang dinyatakan oleh beliau berfungsi sebagai pemprosesan dan penyimpanan maklumat sama ada verbal mahupun visual seseorang. *Phonological loop* adalah elemen yang akan membantu seseorang untuk mengingati verbal dalam suatu jangka masa yang pendek. Elemen *visuospatial sketchpad* pula membantu seseorang untuk mengingati visual, perlakuan, mahupun aktiviti yang dapat dilihat dengan jelas melalui mata kasar seseorang yang kemudiannya akan disimpan kedalam memori. Menurut Logie (2014), *visuospatial sketchpad* dilihat sebagai komponen yang memainkan tugas dalam menerima maklumat visual melibatkan reka bentuk sesuatu objek, warna serta spatial. *Episodic buffer* pula memainkan peranan dalam mengingat verbal, visual dan spatial yang telah dipelajari untuk diiganti dalam suatu tempoh masa yang lebih lama.

Oleh yang demikian, dalam membantu kepada permasalahan ingatan verbal yang dialami oleh kanak-kanak sindrom down, pembelajaran secara verbal dilihat dapat membantu dalam menyokong kepada perkembangan intelektual mereka. Sindrom down mempunyai ciri-ciri pembelajaran yang lebih terdorong kearah penggunaan bahan bervisual sama ada dari segi kekuatan mereka dalam memanipulasikan dalam memori bahan bervisual dalam kehidupan mereka (Buckley et al., 2001; Dehghan et al., 2013). Pada peringkat umur 5 hingga 6 tahun, mereka mula menunjukkan keupayaan dalam menggunakan memori kearah pembelajaran yang hanya menerapkan bahan bervisual, pada peringkat umur yang mencecah 6 hingga 8 tahun mereka mula mengadaptasikan pembelajaran yang menggunakan bahan bervisual dan verbal seterusnya pada umur yang berikutnya, mereka mula menerima kaedah penggunaan verbal dalam pembelajaran mereka (Palmer, 2000). Ini memberikan petunjuk

bahawa kanak-kanak sindrom down ini mempunyai tahap memori yang berperingkat dalam mengadaptasikan sesuatu maklumat yang diberikan berdasarkan ruang memori yang terhad dan mereka memerlukan pembelajaran yang berperingkat.

Justeru, dalam membentuk kepada pembelajaran visual secara berperingkat dalam meningkatkan intelektual, menurut kepada McLoughin & Krakowski (2001), terdapat tiga kontinum pemikiran visual yang telah dinyatakan oleh mereka iaitu :

- a) Pemikiran Visual
- b) Pembelajaran Visual
- c) Komunikasi Visual

Oleh yang demikian, dalam menyediakan kaedah pembelajaran yang dapat meningkatkan lagi kemahiran komunikasi dan verbal mereka, penyediaan suasana pembelajaran yang berbentuk autentik ataupun *real life* dilihat sebagai suatu medium yang mampu mendokong peningkatan pembelajaran mereka. Penggunaan kaedah pembelajaran yang berbentuk autentik serta pembelajaran yang aktif membantu individu sindrom down untuk lebih mudah mengingat dan memahami sesuatu perkataan mahupun pembelajaran (*Down Syndrome Victoria*, 2009). Menurut Van Kraayenoord *et al.*, (2001), pendedahan kepada suasana pembelajaran yang autentik dapat meningkatkan kefahaman mereka serta keyakinan dalam menghubungkan pembelajaran yang dipelajari ke dalam konteks situasi sebenar. Justeru, dalam menyediakan pembelajaran secara autentik, Herrington (2006) telah menyatakan beberapa ciri pembelajaran autentik iaitu:

- a) Menyediakan konteks pembelajaran autentik yang dapat diaplikasikan ke dalam dunia sebenar.
- b) Menyediakan aktiviti yang bersifat autentik.
- c) Menyediakan akses dalam pelaksanaan aktiviti dan proses memodelkannya.
- d) Menyediakan pelbagai peranan dan perpektif.
- e) Menyokong kearah pengukuhan pengetahuan secara kolaborasi.
- f) Menggalakkan kepada refleksi.

- g) Menggalakkan kepada proses artikulasi.
- h) Menyediakan teknik *coaching* dan *scaffolding* .
- i) Menyediakan penilaian autentik dalam setiap tugas yang disediakan.

Bagi menyediakan pembelajaran secara bervisual melalui proses persekitaran autentik yang sesuai, pemilihan medium platform pembelajaran juga hendaklah diteliti. Berdasarkan kepada perkembangan penggunaan teknologi, penggunaan teknologi skrin sentuh dilihat dapat memberikan perkembangan akademik dan komunikasi yang positif, memberikan kemudahan dan keselesaan belajar, serta memudahkan golongan istimewa untuk mempelajari (Kagohara *et al.*, 2013). Menurut Malone (2013), penggunaan aplikasi mudah alih yang terdapat pada teknologi skrin sentuh meningkatkan lagi perhatian dan kefahaman individu sindrom down bagi memahami dan mempelajari sesuatu perkara dengan baik.

Justeru, sebuah aplikasi mudah alih akan dibina bagi membantu kanak-kanak sindrom down untuk membaca dan berkomunikasi. Pembelajaran yang disediakan dalam aplikasi mudah alih ini berdasarkan kepada pembelajaran secara autentik bervisual merujuk kepada kontinum pemikiran visual dalam menyokong ingatan kerja kanak-kanak sindrom down.

PERNYATAN MASALAH

Kekurangan dan kelemahan ingatan pendek verbal yang telah di dapati dalam diri kanak-kanak sindrom down dilihat antara masalah utama dalam perkembangan intelektual mereka. Melalui penulisan yang telah dilakukan dalam latar belakang masalah, ingatan pendek verbal bagi kanak-kanak ini menjadi pendorong dan memberikan kesan sama ada dari sudut komunikasi, membaca, menulis dan pencapaian mereka dari sudut verbal. Masalah ini wujud akibat dari kompilasi pelbagai masalah kesihatan yang mereka hadapi sejak kecil yang menjadi gangguan buat mereka dalam memperolehi tahap intelektual yang selari dengan umur mereka. Hasil dari pembacaan yang telah

dilakukan, pembelajaran secara bervisual dapat meningkatkan dan membantu kefahaman kanak-kanak sindrom down bagi mengatasi permasalahan mereka dalam memperolehi dan mendapatkan pemahaman mengenai sesuatu pembelajaran selain dari pengajaran secara verbal.

OBJEKTIF KAJIAN

Melalui kajian ini terdapat beberapa objektif yang diketengahkan dalam kajian ini, iaitu :

- i. Mereka bentuk aktiviti pembelajaran dalam persekitaran autentik berdasarkan elemen kontinum pemikiran visual bagi menyokong pembentukan ingatan kerja kanak-kanak sindrom down.
- ii. Mengenal pasti keberkesanan aktiviti pembelajaran dalam persekitaran autentik bervisual dalam kalangan kanak-kanak sindrom down terhadap :
 - a) Ingatan Kerja (*Visuospatial Skecthpad, Phonological Loop*)
 - b) Elemen pemikiran visual, pembelajaran visual dan komunikasi visual
- iii. Menghasilkan kerangka panduan aktiviti pembelajaran dalam persekitaran autentik bervisual bagi kanak-kanak sindrom down berdasarkan kontinum pemikiran visual dalam ingatan kerja.

PERSOALAN KAJIAN

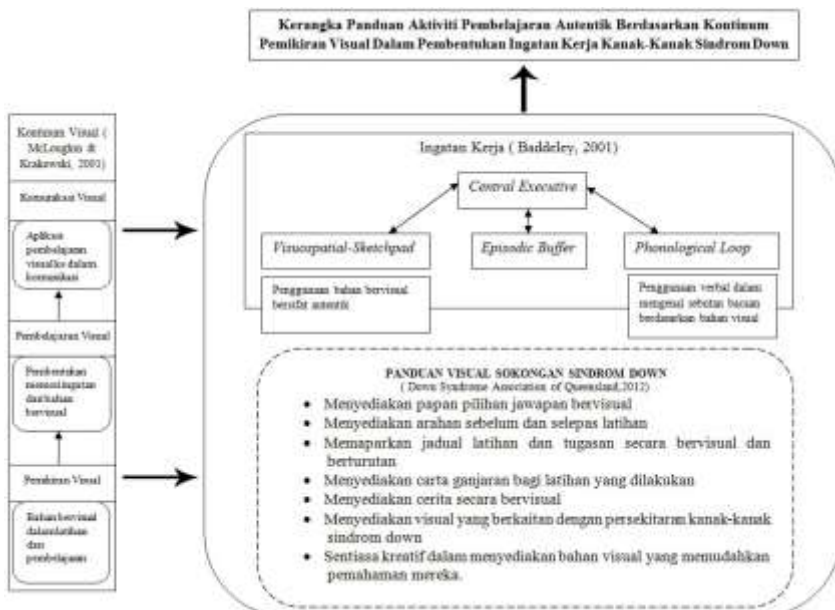
Terdapat beberapa persoalan kajian yang dinyatakan berdasarkan kepada kajian yang akan dijalankan:

- i. Apakah aktiviti pembelajaran autentik berdasarkan kontinum visual kanak-kanak Sindrom Down yang sesuai berdasarkan :

- a) Ingatan Kerja (*Visuospatial Sketchpad, Phonological Loop*)
 - b) Elemen pemikiran visual, pembelajaran visual dan komunikasi visual
- ii. Apakah kerangka panduan aktiviti pembelajaran dalam persekitaran autentik bervisual bagi kanak-kanak sindrom down berdasarkan kontinum pemikiran visual dalam ingatan kerja ?

KERANGKA TEORI KAJIAN

Berikut merupakan kerangka teori kajian yang akan digunakan dalam menyediakan sebuah aplikasi mudah alih berdasarkan kepada pembelajaran autentik bervisual. Disamping itu juga, aktiviti itu juga disediakan mengikut kontinum pemikiran visual disamping menyokong kepada pembentukan ingatan kerja:



Rajah 2 : Model Kerangka Kerja Kajian

KEPENTINGAN KAJIAN

Melalui kajian yang akan dilaksanakan ini, ia akan memberikan beberapa kepentingan kepada beberapa pihak termasuk pelajar, ibubapa, guru, Kementerian Pendidikan Malaysia serta Jabatan Kebajikan Masyarakat Malaysia dalam membantu perkembangan lisan anak-anak istimewa ini. Kanak-kanak sindrom down akan dapat belajar aplikasi android ini menerusi kaedah bervisual yang mana, ianya akan dapat membantu masalah lisan mereka. Justeru, ia sedikit sebanyak dapat meningkatkan perkembangan pembelajaran dan lisan mereka agar tidak ketinggalan dari kanak-kanak normal yang seusia dengan mereka. Dari sudut kepentingan bagi ibu bapa, ianya dapat menjadi alternatif kepada pembelajaran yang akan disediakan kepada anak-anak mereka untuk meningkatkan keupayaan pembelajaran mereka disamping penggunaan terapi lain yang telah banyak disediakan. Kementerian Pendidikan Malaysia serta Jabatan Kebajikan Masyarakat dapat mengenalpasti kelemahan dan kaedah pembelajaran secara bervisual dalam menyokong kepada pembentukan ingatan kerja dan mengembangkan lagi tahap intelektual kanak-kanak sindrom down.

POPULASI DAN SAMPEL

Populasi bagi kajian ini adalah kanak-kanak sindrom down yang berumur sekitar 9-10 tahun di Sekolah Khas Johor Bahru dan seramai 10 orang dipilih. Sampel dipilih secara tidak rawak dan teknik sampel bertujuan (*purposive sample*) digunakan, dimana kanak-kanak yang mengalami sindrom down dan mempunyai sindrom down jenis trisomy-21 dipilih dalam memenuhi kehendak kajian yang dilakukan. Teknik sampel secara bertujuan ini akan dapat memberikan pengkaji dan memudahkan dalam mencapai objektif yang diingini (Creswell,2012). Namun, akan berlaku *dropout* apabila pelaksanaan ujian pra dan pos dilakukan dalam mengenalpasti dan mengabaikan beberapa sampel dalam

memastikan hasil kajian tidak terganggu secara kritikal dan serius. Menurut Creswell (2012), jika terdapat perbezaan yang ketara dengan hasil dapat kajian secara keseluruhan, sampel yang menyebabkan perbezaan yang ketara itu hendaklah diketepikan.

RUMUSAN

Penyediaan pembelajaran yang sesuai untuk kanak-kanak istimewa seperti sindrom down memerlukan perhatian yang khusus berdasarkan keperluan mereka. Kelemahan mereka dalam menggunakan kemahiran verbal hendaklah dielakkan dalam menyampaikan pembelajaran kepada mereka. Justeru, sebagai guru mahupun ibu bapa hendaklah mencari alterbatif yang bijak sesuai dengan keupayaan mereka dalam menggunakan kemahiran visual. Oleh yang demikian, diharapkan agar kajian yang dilaksanakan ini dapat memberikan kaedah alternatif buat pembelajaran kanak-kanak ini menerusi pembelajaran secara autentik bervisual berdasarkan kontinum pemikiran visual yang akan menyokong pembelajaran mereka. Disamping itu juga, ianya dapat membantu dalam membentuk ingatan kerja mereka agar maklumat yang mereka perolehi akan mampu disimpan dalam suatu tempoh masa yang lebih lama. Keprihatinan ibu bapa dan guru diperlukan dalam menyediakan lebih banyak kaedah pendidikan bagi menarik minat kanak-kanak sindrom down ini agar tahap intelektual mereka tidak ketinggalan terlalu jauh dari kanak-kanak normal yang lain.

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PARENTAL PROFESSION AND TYPE OF SCHOOLING: AS PREDICTORS FOR EPISTEMOLOGICAL BELIEFS

Rafaquat Ali, Zainudin Abu Bakar & Nafees Akhtar

ABSTRACT

The parents' profession and type of schooling have relationships to students' school learning. Likewise the student's epistemological beliefs regulate the students' process of science learning and influence students' motivation, learning strategies and quality of learning outcomes. The epistemological belief development relied both on social setup and learning activities in schools. Therefore the present study used multivariate analysis of variance approach to identify the role of the students' type of schooling and parents' profession to their science related epistemological beliefs. Descriptive analysis showed differences in students' means of epistemological beliefs along different dimensions, but taken all these variable in one global MANOVA proved that differences in students' epistemological beliefs in relation to type of schooling and parental professions did not depict population characteristics. It was concluded that students' have similar epistemological beliefs irrespective of their parents' profession and type of schooling (government and private schools).

Keywords: Epistemological Beliefs; Parental Profession; Type of Schooling; Pakistan; Socioeconomic Status

1.1 INTRODUCTION

Although, parental socio-economic status is vital in child education (Kainuwa & Yusuf, 2013), but levels of parental education (Eccles & Davis-Kean, 2005; Laosa, 1982), and parents' profession (Castillo et al., 2011) are crucial in the course of child education. The parental higher education, and higher professional levels were related to students' academic performance, learning behaviours (Kalff et al., 2001; Musarat, Nadeem, Naz, Perveen, & Sameen, 2013; Omolade O., Ajayi, & O.Salomi, 2011), parent-child in home time (Baxter, 2009), and nature of expected learning outcomes (Arshad, Attari, & Elahi, 2012). The probability of child labor is higher in students of unemployed, self employed and employer parents (Parikh & Sadoulet, 2005). Whereas parental job loss reduced post secondary higher education chances (Wightman, 2012). Additionally, parents' profession played decisive role in child education by influencing parental choice of children's school, and children educational track (Dustmann, 2004). The public school has less conducive environment for cognitive development (Castillo et al., 2011), and less students' interest in study as compared to private schools (Ali, Ali, & Naz, 2012; Andrabi, Das, & Khwaja, 2002). Whereas in Pakistan, non elite private schools lack good buildings, qualified teachers, laboratories as compared to government schools (Iqbal, 2012). Whereas, private schools in other developing countries, have moderate positive contribution to better learning outcomes, and better teaching methods (Day et al., 2014).

Besides above factors, students' epistemological beliefs are also one of the important predictors of students' learning behaviors, and achievements. The epistemological beliefs constitute beliefs about process of knowledge development, change and justification of knowledge, and in a way these epistemological beliefs shaped particular understanding of real world around (Hofer, 2000). These epistemological beliefs irrespective of whether naive or sophisticated determined students' engagement, effort and time

spent on learning task (Corte, Eynde, & Verschaffel, 2002).

1.2 PROBLEM OF THE STUDY

Assuming the association between parents' profession, type of schooling (government or private), and epistemological beliefs; the present study probed the problem of parental profession, and type of schooling as predictors for differences in epistemological beliefs of science students in Pakistan.

1.3 POPULATION AND SAMPLE OF THE STUDY

The population of the study was male secondary school science students of government general schools, and non-elite private schools. The sample (N=108) was conveniently selected at ease during visits to different government and private schools.

1.4 DATA COLLECTION AND ANALYSIS

The elder's adapted Urdu Epistemological beliefs questionnaire EBQ was used to measure students' epistemological beliefs across dimensions of certainty of knowledge, omniscient authority and knowledge justification. Demographic data about type of school were collected along this questionnaire. Following hypotheses were tested in the study:

H₀1: There is no difference in population means of dimensions of epistemological beliefs of students for their parents' profession.

H₀2: There is no difference in population means of dimensions of epistemological beliefs of students for their type of schools.

H₀3: There is no difference in population means of dimensions of epistemological beliefs of students for combinations of their parents' professions, and their types of schools.

The type of students' schooling consisted of two levels: government schools and private schools. Whereas the parents' profession constituted three levels: government service, self employed and agriculture profession. The dependent variables were three dimensions of epistemological beliefs: beliefs of certainty of knowledge, belief of omniscient authority and Beliefs of Justification of knowledge by testing and reasoning.

1.5 RESULTS

The descriptive analysis revealed mean differences in epistemological beliefs in groups for school type, and parental profession (See Table 1).

The highest scores in dimension of beliefs of knowledge certainty, beliefs of omniscient authority, and lower scores on beliefs of knowledge justification depicted naive epistemological beliefs. A multivariate analysis of variance was applied after satisfaction of assumptions of normal distribution (observed scores along line of expected scores in p-p plots (Figure 1), and insignificant Shapiro-Wilk Test (Table 2), assumption of homogeneity of variance by insignificant Box's Test, p value of 0.136. Whereas, insignificant p values in Levene' test for dependent variables (beliefs of certainty of knowledge, $p=0.565$, Belief of omniscient authority, $p=0.1230$ and belief of knowledge justification, $p=0.865$) pointed equal error variance among dependent variable across the independent variable groups. Each individual's one score in analysis was independence of scores. Furthermore absence of outliers was ensured.

Table 1 Mean Scores of Epistemological Beliefs in Different Groups

	Grouping Variables	N	Mean	Std. Error Mean	Std. Deviation
Belief of Knowledge Certainty	Government School	51	13.9461	.36281	2.59100
	Private School	48	13.9583	.36643	2.53871
	School Not Mentioned	09	15.5833	.80039	2.40117
	Government Service	39	13.8269	.41329	2.58103
	Self-Employed	38	13.8158	.37994	2.34210
	Agriculture	29	15.0000	.49954	2.69009
Belief Omniscient Authority	Government School	50	13.4440	.38176	2.69945
	Private School	46	14.3522	.59007	4.00204
	School Not Mentioned	09	14.8222	.87967	2.63902
	Government Service	38	14.2000	.55049	3.39348
	Self-Employed	38	13.8737	.55989	3.45141
	Agriculture	27	13.5111	.60899	3.16439
Belief of Knowledge Justification	Government School	48	11.0208	.28245	1.95687
	Private School	48	11.9427	.28386	1.96664
	School Not Mentioned	08	12.0938	.35650	1.00834
	Government Service	38	11.0197	.32161	1.98251
	Self-Employed	38	12.0395	.31109	1.91767
	Agriculture	26	11.4519	.36847	1.87886

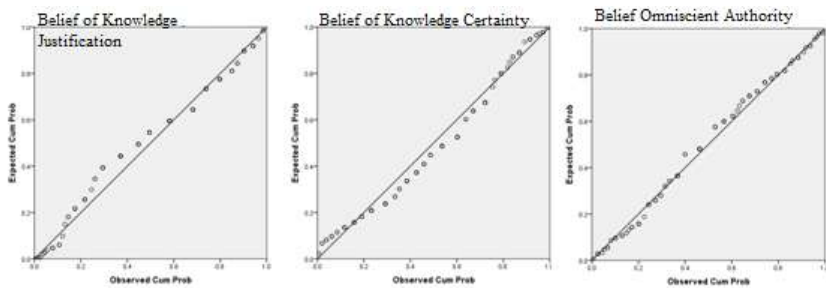
**Figure 1** The P-P Plots of Normality

Table 2 Shapiro-Wilk Test of Normality

	Belief of Knowledge Certainty			Belief Omniscient Authority			Belief of Knowledge Justification		
	Value	df	Sig.	Value	df	Sig.	Value	df	Sig.
Government	0.956	46	0.082	0.978	46	0.513	0.964	46	0.16
Private	0.95	45	0.051	0.967	45	0.229	0.962	45	0.14
School Not Mentioned	0.954	08	0.751	0.855	8	0.108	0.909	8	0.34
Government Service	0.972	37	0.464	0.96	37	0.208	0.922	37	0.01
Self-Employed	0.929	38	0.019	0.981	38	0.764	0.954	38	0.12
Agriculture	0.949	24	0.257	0.92	24	0.058	0.97	24	0.67

Table 3 Multivariate Analysis of Variance

		Grouping Variables		F	Sig.
Multivariate Tests	Combined Dimensions of Beliefs	School		1.483	0.186
		Parents Profession		0.420	0.865
		Parents' profession and School Combined		1.194	0.287
Tests of Between-Subjects Effects	Belief of Knowledge Certainty	School		1.205	0.304
		Parents Profession		0.729	0.485
		Parents' profession and School Combined		1.647	0.169
	Belief Omniscient Authority	School		0.702	0.498
		Parents Profession		0.007	0.993
		Parents' profession and School Combined		1.02	0.402
	Belief of Knowledge Justification	School		2.502	0.088
		Parents Profession		0.435	0.649
		Parents' profession and School Combined		1.442	0.227

The MANOVA analysis (Table 3) showed that as a whole differences in epistemological beliefs among Pakistanis secondary school students in reference to their type of schooling, parents' profession, and combination of students' parental profession and type of schooling was by chance, and $p > 0.05$ rendered the differences statistically insignificant. Thus, we failed to reject three null hypotheses of the study, and it was inferred that there were insignificant differences in students' epistemological beliefs in relation to their type of schooling and parental profession.

1.6 DISCUSSION

The insignificant differences in dimensions of epistemological beliefs in relation to type of schooling, and parental profession in Pakistanis secondary school male students indicated less crucial roles of type of schooling, and parental profession in development of sophisticated epistemological beliefs in Pakistan. It also pointed about probability of similar teaching methods in both private and governments schools which resulted in insignificant differences in epistemological beliefs. Furthermore, socioeconomic status of all students was of lower middle and lower class, and such families contributed less in child school education (Kalff et al., 2001; Musarat et al., 2013). The better teaching methods and strategies of private schools in other elite countries (Day et al., 2014) was not true in case of Pakistan non elite private schools (Andrabi et al., 2002).

1.7 IMPLICATIONS

The present study highlighted the need for interventions aimed at devising strategies for active participation, and involvement of Pakistani families in children's school education. Parents should be made aware of their role in their children's schooling. Similarly there is a need to help government and private school teachers to

use modern student centered teaching methods and learning strategies like discussion and student dialogues to promote sophisticated epistemological beliefs in students.

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FURTHER RETENTION CONTRIBUTE TO SELFREGULATE

Siti Aminah Harun & Zainudin Abu Bakar

ABSTRACT

This paper will explore the issues of retention approaches in gaining direct self-regulatory skills. First, it will describe the essential of these skills in enhancing the human capital by their emotional intelligence practice by their own observation on their surrounding especially the retention the appropriate ideas and value. The methodology this research will employ includes a review secondary source about students' learning and regulation skills. The research on students' learning and regulation skills vary according to different field of studies and courses of the subject. The primary research hypothesis is indicate different courses of subject attempt the different medium of observational learning and self-regulate. However the same point stressed here is about the regulation skills can be learning by many approaches such as by practice, by the attribution result from direct past experiences and by similarities with others. Retention is a process involves the representation of an observed model in memory in a symbolic form, imagery, or verbal coding. Self-regulation skill is an integrated learning process, consisting of the development of a set of constructive behaviors and emotional those affect one's learning. In conclusion, the three approaches discussed (practice, past experiences and similarities) contain numerous social learning influences, which maybe either compatible or conflicting. These influences then needed the regulation of self skill to alter the stress between these two.

Keywords: retention; self-regulation; learning

INTRODUCTION

Human capital development is one of the priority areas in the country's development agenda under the Ninth Malaysia Plan which runs from 2006 to 2010 (The Economic Planning Unit 2006). The Malaysian Prime Minister in tabling the Ninth Malaysia Plan on March 31, 2006 reinforced that the development of human capital and the upgrading of the mentality and intellectual capacity of a nation must be a priority if Malaysia is to be a developed country. Focusing on this human capital development will enable the country to raise its capacity for knowledge, creativity, and innovation, which are essential elements in the context of globalization. Hence, to increase this capacity, the learning styles of students must be emphasized. The learning styles view has acquired great influence within the education field, and is frequently encountered at levels ranging from kindergarten to university. An individual's learning style is a distinctive and habitual manner of acquiring knowledge, skills or attitudes through study or experience (Seligman, 1996). Enhancing the human capital by their emotional intelligence practice such as self-regulatory, and self-esteem by their own observation on their surrounding especially the retention the appropriate ideas and value can be useful to direct learning.

STUDENT'S LEARNING & SELF-REGULATION

The definition of retention explains by Bandura is observers must not only recognize the observed behaviour, but also remember it. This process depends on the observer's ability to code or structure the information so it is easily remembered. Processes involve the representation of an observed model in memory in a symbolic form, imagery, or verbal coding. Continuously the retention will affect the self-regulation of individuals. Self-regulation skill is an integrated learning process, consisting of the development of a set of

constructive behaviors and emotional those affect one's learning. In direct learning, human tendencies might to acknowledge the learning from their own observational or listening to their own environment and mingling with peoples surrounded. This type of learning occur after process leading from observation of modelled events to a matching pattern of behaviour that being noted by attributions of observer. Observational learning involves attentional, retention, production and motivational sub processes. Each of these four processes is governed by the nature of the modelled behaviour and its social context (Bandura, 2011; 2001; 1986). In observational learning, retention play a crucial part like the other three sub process in observational learning. In this study, focusing in retention is also an essential part in student's learning. Explaining the retention in human life learning, applied in many field yet still it goes to the same concept of observational learning. Recent studies investigate observational learning effects in a service context. For example, Cai *et al.* (2009) demonstrate that restaurant visitors learn from other consumers' food choices. If restaurant visitors receive ranking information of the five most popular dishes at their table, the demand for these dishes increases by 13 to 20 percent. Service researchers also recognize the importance of understanding observational learning effects. In a literature review on customer-to-customer interactions, Libai *et al.* (2010) stress that while previous research focuses mainly on the learning effects of word-of-mouth (without direct observation from observer, but indirect retention of observer by regulating the learning from hearing from others). In conclusion, directed observational learning and indirect observational learning are different but yet applied the same four sub-process of learning. Customers who learn from word-of-mouth must rely on experiences that they did not observe directly (Kuo *et al.*, 2013; Wirtz *et al.*, 2013). In other words, observational learning involves customers seeing another customer's experience with their own eyes. Locus of control attributions is also relevant in a context where one observes two other people. In this case, loci of control attributions refer to whether the service failure is caused by the

service provider or the other customer (Sousa 2006; Cowley, 2005). Early perception of retention in observational learning, brought individual thinking regulate their own actions and behave either direct or indirect observational learning. The writer belief it's just will the same way towards students and their surrounded. The same thing applied, when students having his own self-regulation, he might attribute the retention, by either direct observed or observed from his peers' experiences. Regulations skills can be learning by many approaches such as by practice, by the attribution result from direct past experiences and by similarities with others.

Physical Practice

Physical practice is not the only way to acquire new motor skill but by observation of a model, human can facilitate learning in a wide range of behaviour and skills (Bandura 1986; Blandin & Proteau, 2000; Mattar & Gribble, 2005). Numerous experimental manipulations have been shown to impact observational learning in a manner very similar to that for physical practice, and hence enforce the suggestion that similar cognitive processes are involved between the two practice conditions (Adams, 1986). In accordance with this retention by physical practice, neuroscientists report that a set of common neural structures is implicated during both action production and action observation (Greezes & Decety, 2001; Gallese & Goldman, 1998). Self-regulate of any favourable behaviour or emotion can be directly encoded by attribution of students through their retention of their peers during having practice activity mainly subjected to them by their lecturers to exercise favourable skills needed. Shea, Wright, Wulf, and Whitacre (2000) proposed that observation and physical practice could afford specifics opportunity to learn action composed of abstract and scaling structures. Retention emphasizes learning more on the abstract structure and scaling representation is deeply encoded and updated throughout physical practice. In actuality, all learning of

phenomena, resulting from direct experience (Markus and Nurius, 1986) can occur vicariously by observing other people's behaviour and its consequences for them. Moreover, further research by Eric indicates that combining observational learning and hands-on practice can be an efficient way to train individuals or students on complex tasks (Eric, 2003).

Retention by Past Experiences

Inconsistently people regulate their emotion, attitudes and behaviour by skills varied with their own perception. Students usually regulate by the attributions and express it with action behaviour or emotion perspective. Observational learning's sub processes which is retention, exercise the attribution apparently. From the perspectives of marketing and social students, the subjects a part of it, they were thought about human customer satisfaction and indirectly exposed them about regulating self-skill through by many research shown in their related field and applied on retention by them. In the study of Weiner in 2000, suggests that locus of control attributions mainly attenuate customer reactions to negative events. She therefore predicts that the attributions mainly attenuate the effects of observing an unsatisfactory service recovery. If the service provider is responsible for the service failure, the observing customers learn that the service quality is not always reliable (Michel *et al.*, 2009). If a customer sees that a service provider treats another customer badly, this service recovery influences the observer's service quality perceptions, which in turn affect her/his evaluations of the service provider. Customers therefore do not rely on only their own experiences to gain insights about the service provider's service quality; they also rely on their observations of other customers' experience. This finding emphasizes the importance of installing appropriate service recovery procedures, to restore the complaining customer's satisfaction and behavioural intention, not only for the complaining customer him/herself but

also for the customers who are present. These service recovery tactics involve, for example apologizing, showing empathy, giving an explanation, and providing compensation or restitution (Liao, 2007; Van Vaerenbergh *et al.*, 2012). In exercising the retention to exposed students having own self-regulation, the scenario created in lecturing to live up the mood of students in learning as well applied the self-regulation. The scenarios created will be the act of attribution (retention) in distinguishing and realizing own self-regulation appropriate acceptance or not in reality and currently issues happened nearby. The attribution process happening by retrieving the past experiences or current knowledge in regulate the self-evaluation. Scenarios also have the advantage of reducing biases from memory retrieval when using recall-based designs (Smith *et al.*, 1999). As a result students will retention the knowledge based on the scenarios or the theme of the issues. It is accordance with the research in 2013, which the research indicates that customers learn about brands and services through word-of-mouth (Kuo *et al.*, 2013; Wirtz *et al.*, 2013). Retention just like the other three sub processes in observational learning, is governed not only by the nature of the modelled behaviour and its social context but also by attributes of the observer (Bandura 1986).

Retention by Similarities

Social learning theory provides the most comprehensive and useful explanation of the processes of vicarious or observational learning. Social learning theory suggests that the processes leading from observation of modelled events to a matching pattern of behaviour involve attentional, retention, production, and motivational sub processes. In matching the pattern, the similarities and the effect of group think will indirectly affected the retention of observed behaviour in self-regulation. When the modelled behaviour is retained through coding, organizing, and rehearsing , at the same time imitative behaviour occurs will also depending on the

perceptual capabilities, perceptual set, cognitive capabilities, arousal level, and acquired preferences of the observer. Conventional wisdom, informal observation of social support groups, and behavioural research all suggest that people will more readily imitate those whom they perceive to be similar to themselves in significant ways (Bandura, 1986). One research by Stephen in 2007, observing the invisible which examining the role of observational learning in the development of leadership practice. The role of “notable person” here as a indicator based on the similarity of the model and observer, as well the retention motivational to became or learn the favourable characteristics of him in exercising the great leadership.

“Notable people” are central to processes of learning through participation with others, and prominent in shaping identity development (Higgins and Bargh, 1987). Ganellen *et al.*, (1985) argued that people’s interpretation and understanding of social phenomena is significantly affected by observations of people. Hogg (2001) extends this point to suggest that learning of social phenomena such as leadership is shaped through interactions with others. Self-regulation on the appropriate characteristic of - leadership is being learned. If leadership is learned through a complex and invisible form of informal apprenticeship through social interaction with notable others in a variety of contexts, so the shown characteristics being directly retained and scanned must be produce in action or perception to make the visible impact. These characteristics may attenuate the effects of appropriate peer models and complicate the teaching of desirable social imitation. Thus, without an explicit, systematic program of teaching social skills, peer models might be expected to have little positive effect and how the group think effect continuous.

CONCLUSION

Peter and friends, 2004 in his research define self-regulation is an

integrated learning process, consisting of the development of a set of constructive behaviours that affect one's learning. These processes are planned and adapted to support the pursuit of personal goals in changing learning environments. The term self-regulation (sometimes also called executive function) refers to the capacity to control one's impulses, both to stop doing something, if needed (even if one wants to continue doing it) and to start doing something, if needed (even if one does not want to do it). Self-regulated at the university level can delay gratification and suppress their impulses long enough to think ahead to the possible consequences of their actions or to consider alternative actions that would be more appropriate. Self-regulation is not limited to the social-emotional domain; it can also apply to cognitive behaviours, such as remembering or paying attention. Regulations like recognizing their own behaviour and compared it with the culture happened. Bandura (1986) explains observers must not only recognize the observed behaviour, but also remember it. This process depends on the observer's ability to code or structure the information so it is easily remembered. Processes involve the representation of an observed model in memory in a symbolic form, imagery, or verbal coding. Continuously the retention will affect the self-regulation of individuals. Because people constantly preside over their own behaviour, they are in the best position to bring self-regulation to bear on their actions whenever need be. In exercising personal control, people adopt internal standards, monitor their actions, and use self-incentives to mobilize and sustain their efforts until they accomplish what they set out to do. As has been previously noted, observational learning (the retention by physical practice, past experiences, similarities) and other situational influences affect actions in large part through the exercise of personal regulate. So even incentives influences, it is all depends on self-regulatory influence for their impact to behave. Applications of knowledge generated by this line of research show that people can extend and sustain changes in their behaviour with the aid of self-regulatory skills (Morgan & Young, 1983 in Elsner, 2001). Some

people came with different standards of learning, some set the goal, some accomplishing the target by comparing with others and some reach the optimum learning by invisible or indirect approach of model-observer relationship. In regulate themselves and comparing with others, they might come with practice a lot, depending on similarities standards to retain the favourable behaviour, emotion and attitude as well by attribution by the past experiences people tend to learning about how they should behave or taking care certain deviant issues in their culture. They use the adopted standard to regulate their effort and to judge the adequacy of their performances. Self-evaluation is affected by modelled standards, regardless of prior experience with the activity. When observers have only modelled self-regulation actions to go on, they have to infer the underlying standard from how models react to their own behaviour in different situations. In everyday life, of course, models not only react regulatory but also often voice the standards they are using to judge the adequateness of goodness of their behaviour. The impact of modelling influences is increased when standards are expressed in word as well as in action (Liebert 1969 in Jeannerod 2003). Social environments contain numerous modelling influences, which maybe either compatible or conflicting. These influences then needed the regulation of self-skill to alter the stress between compatible or conflict, yet bring students to make the win-win situation decision for both influences and bring far to the life extend of high emotional intelligence among our students.

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PROMOTING SOCIAL-EMOTIONAL LEARNING IN SCHOOL

Lee Moi Ching, Yeo Kee Jiar & Hadijah Jaffri

ABSTRACT

School appears to be vital contexts for students and it may be a very important contributor towards the formation of varied abilities and motivations for learning. Lack of social-emotional competencies (SEC) causes less connected to school and negatively impacts their academic performance, behaviour, health (Blum & Libbey, 2004), and also causes negative activities involvement such as discipline problems or crimes. Social-emotional learning (SEL) programs yielded multiple benefits in much research review and were effective for students with and without behavioral and emotional problems. They were also effective across the preschools to institutions of higher learning range and for racially and ethnically diverse students from urban, rural, and suburban settings. SEL improved students' social-emotional skills, attitudes about self and others, connection to school, positive social behavior, and academic performance; they also reduced students' conduct problems and emotional distress (Payton, Weissberg, Durlak, Dymnicki, Taylor, & Schellinger, 2008). CASEL (2007) and Zins and Elias (2006) indicated that SEC can be taught by classroom teachers in school through SEL program, as schools are highly effective setting for teaching SEL skills (Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011).

Keywords: Social-emotional learning; Social-emotional competence; School

1. INTRODUCTION

A key challenge for twenty-first century schools involves serving socio-culturally diverse students with varied abilities and motivations for learning (Payton, Weissberg, Durlak, Dymnicki, Taylor, & Schellinger, 2008; Learning First Alliance, 2001). Unfortunately, many students lack social-emotional competencies and become less connected to school as they progress from primary to institutions of higher learning, and this lack of connection negatively affects their academic performance, behavior, and health (Blum & Libbey, 2004).

According to National Health and Morbidity Survey (2011), mental health problems among adolescence and children of age 15 and below rose to 20 percent in year 2011. In Malaysia, so far there is no detailed data available for a representative national sample. However, the condition of mental health conditions in adolescents has been a growing concern. Mental health difficulties or problems are often a great burden to the individual, family, school and with friends. Physical symptoms such as behavior problem are a manifestation of psychological difficulties. Discipline problem is a common phenomenon in every school in Malaysia.

Thus, with the absence of social-emotional competencies and emotional literacy, when the students are facing challenges in life, they will involve in various types of serious breaches of school policy and negative activities, such as bullying, truancy, gangsterism, vandalism, juvenile delinquency, pornography, drug use and the list will go on and on. According to Former Deputy Minister of Education, Datuk Dr Wee Ka Siong, 111,484 students were caught for indiscipline and comprised of 72,557 or 65.08 percent from secondary schools and 38,927 or 34.92 percent from primary schools. This included 17,595 students (0.32%) who were involved in crime, truancy (19,545 or 0.36%), misbehavior (18,346 or 0.39%), pornography (3,031 or 0.06%) and vandalism (5,212 or

0.1%) (MySinchew, 2010, December 27).

The phenomenon of aggression in students is escalating, and occurs among younger and younger children. Students who have difficulties in managing emotions, developing positive relationships with others, and unreadiness for the schooling process, are at increased risk for social and emotional problems (Zins, Weissberg, Bloodworth, & Walberg, 2004).

Nevertheless, there is no more important time than now to recognize students's personal needs. A broad and balanced education prepares students to master basic academic skills and also equip them to become responsible adults, so that they can be succeed in life (Association for Supervision and Curriculum Development, 2007). Families, schools, and communities play a vital role to identify and promote children's social, emotional and academic engagement through research-based approaches. Researches indicates that social-emotional learning (SEL) programming for school students is a very promising approach in promoting positive adjustment, reducing problem behaviors and improving academic performance (Diekstra, 2008; Zins, Weissberg, Wang, & Walberg, 2004).

2. DEFINING AND UNDERSTANDING SEL

The term social and emotional learning was first introduced in 1994 as a conceptual framework for addressing both the needs of young people and the fragmentation that typically characterizes the response of schools to those needs (Greenberg, Weissberg, O'Brien, Zins, Fredericks, Resnik, & Elias, 2003). Collaborative for Academic, Social, and Emotional Learning [CASEL] (2003) defined the concept of SEL is the process of acquiring and effectively applying the knowledge, attitudes, and skills necessary to recognize and manage emotions; developing caring and concern for others; making responsible decisions; forming positive relationships; and handling challenging situations capably. Students

learn, practice, and apply SEL skills by engaging in positive activities in and out of the classroom, just similar to the way they learn academic skills (Zins et al., 2004).

SEL contains five core components in terms of social-emotional competence (SEC) (CASEL, 2007). SEC is the ability to understand, manage, and express the social and emotional aspects of one's life in ways that enable the successful management of life tasks such as learning, forming relationships, solving everyday problems, and adapting to the complex demands of growth and development. It includes self-awareness, control of impulsivity, working cooperatively, and caring about oneself and others. Social and emotional learning is the process through which children and adults develop the skills, attitudes, and values necessary to acquire social and emotional competence. Table 1 shows the five core components of SEC.

Interest in SEL sparked in the mid-1990s with the publication of Goleman's *Emotional Intelligence* (1995) and Gardner's *Multiple Intelligence* (1993). In *Emotional Intelligence*, Goleman (1995) provides much evidence for social and emotional intelligence as the complex and multifaceted ability to be effective in all the critical domains of life, including school. But Goleman (1995) also does us the favor of stating the key point simply: "It's a different way of being smart."

Table 1: Key Social-Emotional Competencies (CASEL, 2007)

Core SEL	Description
Self Awareness	Identifying and recognising emotions
	Accurate self-perception
	Recognising strengths, needs and values
	Self-efficacy
Social Awareness	Spirituality
	Perspective taking
	Empathy

	Appreciating diversity
	Respect for others
Self Management	Impulse control and stress management
	Self-motivation and discipline
	Goal setting and organizational skills
Relationship Management	Communication, social engagement and building
	Working cooperatively
	Negotiation, refusal and conflict management
	Seeking and providing help
Responsible Decision Making	Problem identification and situation analysis
	Problem solving
	Evaluation and reflection
	Personal, moral and ethical responsibility

SEL program contains the context of caring, safe, well-managed, and participatory classroom, school and other learning environments. All students including those who are at risk, those beginning to engage in negative behaviors, and those are at high risk with displaying significant problems, might benefit from SEL program and instruction. The focus of most SEL programs is universal promotion and prevention, which is aimed in preventing problem behaviors by promoting and enhancing social-emotional competencies.

SEL programming intended on enhancing the growth of all children, to help them develop positive behaviors, and to prevent them engaging in maladaptive and unhealthy behaviors. Some children with at risk symptoms may require moderate treatment that focuses on social-emotional competencies, they might benefit from SEL programs also.

SEL is perhaps more important than ever as an essential component of school reform (Zins et al., 2004). Researches

revealed that these skills can be taught, and can be taught by regular classroom teachers in school of every type to students of every background through SEL program (CASEL, 2007). According to reliable research, schools are a highly effective setting for teaching SEL skills, and schools play an important role in raising healthy children by fostering their cognitive development and also their social-emotional development (Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011).

3. IMPACTS OF SEL: WHY THE STUDENTS NEED IT?

The importance of the development of social and emotional competence in the school years cannot be overstated. Beyond the social framework of the family, school is the primary means by which children learn how to be effective in the social world (Babad, 2009). Developing SEC is essential and critically important to success in school and life. SEC affects how and what we learn, and that SEC can be taught in education (Zins & Elias, 2006). CASEL (2007) stated that the effectiveness of SEL is broad-based, with several hundred studies have documented the positive effects of SEL programming on students of diverse background from preschool through high school in a wide variety of settings (Greenberg et al., 2003). Hundreds researches were carried out to evaluate the impacts of universal, indicated and after school SEL program.

Durlak et al. (2011) completed a most recent and comprehensive analysis of the impact of universal SEL programs. Their research presents findings from a meta-analysis of 213 school-based and universal SEL programs, involving 270,034 students from kindergartens through high schools of different ages, from schools in urban, suburban, and rural settings, and from schools primarily serving ethnically and socio-economically diverse student bodies. Positive findings with statistically significant were obtained in all six outcome categories at post (CASEL, 2008). The

students demonstrated positive impacts in more positive attitudes toward self and others such as self-concept, self-esteem, prosocial attitudes toward aggression, and comfortable feeling connected to school). Other positive impacts included increased social-emotional skills such self-control, decision-making, communication, and problem-solving skills; more positive social behaviors such as daily behaviors related to getting along with and cooperating with others; fewer conduct problems such as aggression, disruptiveness; lower levels of emotional distress such as anxiety, depressive symptoms; and significantly better academic performance in school grades and achievement test scores.

Durlak et al. (2011) concluded that SEL programs demonstrated significant improvement in social-emotional skills, attitudes, behavior, emotional stress and academic performance. Effect sizes were largest for social and emotional skills. Their findings support the growing empirical evidence for the positive impact of SEL programs.

Zins et al. (2004) make a convincing case for the benefits of SEL in schools, in their book *Building Academic Success on Social and Emotional Learning: What Does the Research Say?*. The reviews of the scientific evidence in support of SEL were devoted in their 12 chapters. They concluded three primary areas into which these numerous outcomes fit included school attitudes, school behavior and school performance. School attitudes are the stronger sense of community, higher motivation, increased sense of coping, better attitude about school and better understanding of behavioral consequences. Benefits in school behavior included more prosocial behavior, fewer suspensions, higher engagement, reductions in aggressive behavior, fewer absences and more classroom participation. Meanwhile higher achievement in mathematics, language arts, and social studies; improvements in achievement test scores and use of higher-order thinking strategies, are included in school performance.

Another influential meta-analytic study is completed by Wilson, Gottfredson, and Najaka (2001), offering strong support of

the potential effectiveness of SEL practices in schools. In their review of 165 separate studies of school-based SEL program, indicated many positive effects, particularly focusing on reductions in delinquency and substance abuse among students, reductions in school dropout and nonattendance, and increase in both cognitive and behavioral forms of self-control and social competence.

4. CONCLUSION

There are numerous researches available in quantitative form to support the value of SEL. SEL is such learning which has powerful impact on academic achievement and adult life of children (CASEL, 2007b; Justice & Espinoza, 2007). The numerous researches also tell us a truth that SEL in school has promising effects and positively affect students' affective, behavioral, and cognitive development. It promises a great deal in terms of improved academic, social and emotional outcomes for students. SEL can serve as the organizing framework for a broad array of prevention and promotion efforts (Elias, Arnold & Hussey, 2003). Schools are such important central arena for health promotion and primary prevention, and SEL is a must addition to the education of students (Panju, 2008).

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IMPLEMENTATION OF INCLUSIVE EDUCATION PROGRAMME IN MALAYSIA

Teng Kie Yin, Yeo Kee Jiar & Hadijah Jaffri

ABSTRACT

In recent years, Ministry of Education in Malaysia has taken its radical move to go in line with the global trend to include students with special needs in mainstream classrooms. Full and equal participation among students with special needs in Inclusive Education Programme has been highlighted nationwide in the National Education Blueprint based the Salamanca Statement and Framework for Action on Special Needs Education (1994) and the Persons with Disabilities (PWD) Act (2008). Besides that, “Garis Panduan Program Pendidikan Inklusif Murid Berkeperluan Khas (Edisi Percubaan)”, the guidelines on the implementation of the Inclusive Education Programme was released in year 2013. The five elements on implementation of Inclusive Education Programmes and their insufficient coverage in providing effective inclusive education to students with special needs have been discussed. A more comprehensive resource has been suggested in order to strengthen the existing guidelines.

Keywords: implementation; Inclusive Education Programme; Malaysia

1. INTRODUCTION

Taylor (2006) described inclusion as serving students with a full range of abilities and disabilities in the mainstream classroom with appropriate in-class support.

Inclusion is defined as students with disabilities are being included in age appropriate mainstream classrooms where supports and services are provided to both students and teachers to enable the disabilities students to participate fully in academic and extracurricular activities as their peers in school communities (Snow, 2013).

Since 1990s, United Nation (UN) and United Nations Educational, Scientific and Cultural Organisation (UNESCO) have cultivated awareness of equal education rights among all children globally via several UN policies such as *UN Convention on the Rights of the Child* (1989), the *UN Standard Rules on the Equalisation of Opportunities for Persons with Disabilities* (1993), the *UNESCO Salamanca Statement* (1994) and the *UNESCAP Biwako Millennium Framework* (2002).

In line with the children's rights movement, Malaysia has taken its initiative to advocate special education in the Malaysian Education Act 1996 (1998) for the children with special educational needs (SENs) who have a learning difficulty or disability that hinder them from making use of educational facilities provided in schools. Besides that, in the Education (Special Education) Regulations 2013 (Government of Malaysia, 2013), the students with special educational needs will be provided with Special Education either in special schools or schools which implement Special Education Integrated Programme or Inclusive Education Programme at all school levels.

Government of Malaysia has put in lots of effort to improve the quality of inclusive education among the students with special needs. Based on the Salamanca Statement and Framework for Action on Special Needs Education (1994) and the Persons with Disabilities (PWD) Act (2008), Ministry of Education of Malaysia

set up its mission to give full and equal participation to those students with special needs in education as stated in National Education Blueprint (2013-2025) (MOE, 2013). In year 2013 too, “*Garis Panduan Program Pendidikan Inklusif Murid Berkeperluan Khas (Edisi Percubaan)*” (MOE, 2013) has been released in order to give guidelines on the implementation of Inclusive Education Programme.

The purpose of this article is to examine the implementation of inclusive education programme at school levels. Thus, some issues will be highlighted in this article for the betterment of Malaysia education system.

2. IMPLEMENTATION OF INCLUSIVE EDUCATION PROGRAMME IN MALAYSIA

Based on latest released “*Garis Panduan Program Pendidikan Inklusif Murid Berkeperluan Khas (Edisi Percubaan)*” (MOE, 2013), there are two types of inclusive education available in Malaysia: full inclusion and partial inclusion.

In full inclusion, students with special needs are placed in the mainstream classrooms full-timely with their typical peers for all the academic subjects. For partial inclusion, students with special needs are included for certain academic subjects or co-curricular activities based on their abilities, talents and potentials.

Under Inclusive Education Programme, the included students will be following the national curriculum or modified national curriculum with or without services and supports provided.

There are five elements being highlighted in the implementations of Inclusive Education Programme:

1. Students’ Criteria

For the qualification to be included in Inclusive Education Programme, a student with special needs has to pass certain assessment which is determined by Ministry of Education (MOE). Besides, the qualified student will be included in

age appropriate mainstream classroom or different at one year older than the mainstream students.

2. *Students' Placement*

Committee of School Special Education Programme will approve the qualified students with special needs to follow the Inclusive Education Programme. The student will be given a maximum of three months trial period in Inclusive Education Programme. For those who fail the trial, they will return to integration programme in special education. The students with special needs are encouraged to be placed in the mainstream classrooms with not more than thirty five students. Each of the mainstream classrooms will not being placed more than five students with special needs. They will be included in the mainstream classrooms which are equivalent to their achievement.

3. *Teacher*

Mainstream teachers should be given professional development to manage the special needs students in their classrooms. The assistance provided by special education teachers to mainstream teachers is crucial in determining the success of Inclusive Education Programme.

4. *Teaching and Learning*

The included students should follow the national curriculum in mainstream classrooms. Modifications on teaching, materials preparation and delivery approaches can be made to ease their learning. Lesson planning should be made based on students' medical reports, profile and achievement records. Mainstream teachers should include the specific learning needs of the students in their daily lesson plan. In addition, Individual Education Planning can be prepared in order to look into their appropriate intervention needs. Both mainstream and special education teachers should collaborate in planning the teaching and learning process in mainstream classrooms.

5. *Assessment*

The students with special needs in Inclusive Education Programme should be given same assessment as well as evaluation either in curriculum or co-curriculum. They will be given equal chance to sit for public examination too.

3. DISCUSSION

Malaysia has yet to put inclusion education programme into full practice. We are still practicing a dual system education: a special education system for students with moderate, severe or profound disabilities and a regular system for those without or mild disabilities.

According to Zalizan and Manisah (2012), Malaysians and educators should recognise that all children included those with disabilities are eligible for equal access to education. UNESCAP (2002) has declared that education is a fundamental right for every child. Criteria chosen and qualification assessment for students with special needs to be included have gone against this legislation and restricted their learning environment.

ALLFIE (2014) defined the integration as the special educational needs students should fit in the existing learning environment in mainstream classrooms by some provided accommodations and resources. It seems MOE's intentions is aligned with the integration models which mainly focuses on placing special needs students in mainstream classrooms and they are expected to adapt to the existing education system rather than the education system adapting to the learner (UNESCO, 2008).

Furthermore, collaboration between mainstream and special education teachers is vital in an inclusive classroom and there should be a clear guideline on Inclusive Education implementation (Manisah, Ramlee and Zalizan, 2006). Thus, professional development towards exposure and training in special education for mainstream teachers as well as pedagogical training for special education teachers should be provided. Both mainstream and

special education teachers should attend more courses or training on collaborative classroom planning and teaching so that the responsibilities do not merely fall on special education teachers in assisting the mainstream teachers in the skills of handling special needs students.

Malaysia education field is still implying an examination-oriented system which can be clearly seen from the great emphasis on assessment in the implementation of Inclusive Education Programme. Schools are pressured to strive for excellence via the best examination results (Hamzah, 2007). Therefore, special needs students are normally not welcomed to be placed in mainstream classroom due to probable poor examination results obtained. The government, should therefore established alternative assessment system or rewarding system for the teachers, or schools of which showed their great effort to include these special needs students in examinations (Lee and Low, 2014).

In my opinion, the five elements in the “*Garis Panduan Program Pendidikan Inklusif Murid Berkeperluan Khas (Edisi Percubaan)*” (MOE, 2013), currently used in Malaysia are insufficient in its coverage to provide effective Inclusive Education for Students with Special Needs. We can therefore refer to other resources for a more comprehensive details such as “Quality Indicators for Effective Inclusive Education Guidebook” by New Jersey Coalition for Inclusive Education (NJCIE, 2010) of which also look into other elements such as curriculum, leadership, school climate and so on.

4. CONCLUSION

In a nutshell, Inclusive Education Programme is still in its infancy stage in Malaysia. MOE should look into the feedback above and review accordingly so that we will be on the right track in moving towards inclusionary for students with special needs.

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THE ROLE OF WORKING MEMORY IN ACADEMIC ACHIEVEMENT

Teo Sieak Ling & Yeo Kee Jiar

ABSTRACT

A better understanding of the nature of human working memory may have important implications for understanding why people differ in cognitive skills and abilities and why individuals have different degrees of success in their efforts to accomplish real-world goals. Extensive scientific studies in human cognitive psychology have led to further investigation of short term memory with the introduction of working memory. The aim purpose of this conceptual paper is to define working memory and its association with complex cognitive skills as well as its influence on domain specific activities in academic disciplines.

Keywords: working memory, short-term memory, the central executive, the phonological loop, the episodic buffer, visuospatial sketchpad, literacy skills, numeracy skills

1.7 INTRODUCTION

Many studies were carried out to investigate factors associated with academic achievements. The influence of working memory on academic learning has drawn extensive attention of psychologists, researchers and educators over the past 25 years. There are findings revealed that a child's success in all aspects of learning is down to how good their working memory is regardless of IQ score (Alloway, 2010). Just only in the first six months of 2007, more

than 150 articles on working memory were published in professional journals. This amazing figure implies how important of working memory in academic learning. With more knowledge on working memory, educators can better understand how students think, learn and remember. Therefore, appropriate evidence-based interventions can be planned and implemented to help those students with learning difficulties.

1.8 THE MEASUREMENT AND ASSESSMENT OF WORKING MEMORY

According to Baddeley (1986), working memory is “a system for the temporary holding and manipulation of information during the performance of a range of cognitive tasks such as comprehension, learning, and reasoning”. Baddeley’s model was widely being investigated in a large number of studies over the past 3 decades. Only in 2006, a new model was drawn (see Figure 1).

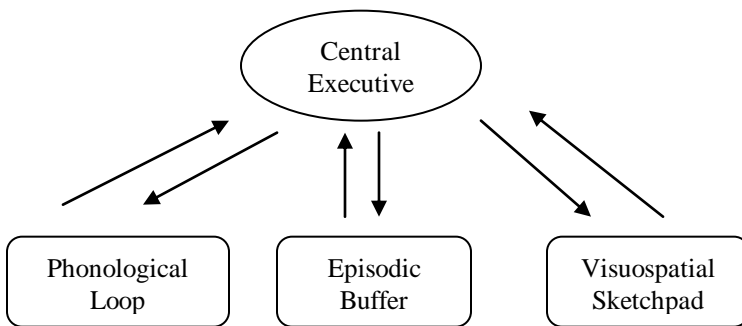


Figure 1 Baddeley’s (2006) working memory model.

1.2.1 The Central Executive

The central executive is considered as the core of working memory. It monitors and coordinates the operation of the other three subsystems and relates them to long term memory (Baddeley, 1996a).

However, in the revised working memory, the central executive plays the role in allocating attention within the working memory system through focusing, dividing and switching attention.

Complex span tasks are the common measures used to assess the central executive. These tasks require both the process and storage of information. Complex span tasks are used in various studies for instance short-term memory storage and information processing capacity (Daneman & Carpenter, 1980), time-based resource-sharing (Barrouillet et al., 2009), or the mechanisms of working memory capacity (Shipstead et al., 2014).

1.2.2 The Phonological Loop

The phonological loop is a part of working memory that deals with auditory or verbal information (Baddeley & Hitch, 1974). It is divided into two subcomponents: 1) phonological store (inner ear) and 2) articulatory rehearsal process (inner voice).

The phonological store is short-term and holds verbal information (spoken words) for 1-2 seconds before it begins to decay. The articulatory rehearsal process helps maintain verbal information from the phonological store by reviving the memory internally.

To assess the phonological loop functioning, the immediate serial recall of verbal information is commonly used in research. According to Alloway (2006), there are two broad categories of tests to measure verbal memory, namely **verbal short-term memory (STM)** and **verbal working memory (WM)**. Three measures of verbal STM are *digit recall*, *word recall* and *nonword*

recall. In such tasks, a sequence of numbers or words is presented, participant is asked to recall the items in their original order. Participant is considered correct only if an item is recalled in the correct position in the sequence.

As for verbal WM, the three measures are *listening recall*, *counting recall* and *backwards digit recall*. In such tasks, participant is given verbal information (spoken and written) then participant needs to process and manipulate the information before it is to be recalled.

1.2.3 The Visuospatial Sketchpad

The visuospatial sketchpad specialises for the maintenance and manipulation of visual and spatial representations (Baddeley & Logie, 2000). It plays a vital role during reading, as it usually encodes printed letter and words while maintaining a visuospatial frame of reference (Baddeley, 1986).

Tasks used to measure the visuospatial sketchpad component of working memory are – **visuospatial STM** and **visuospatial WM**. Three measures of visuospatial STM are *dot matrix*, *mazes memory* and *block recall*. As for visuospatial WM, it encompasses *odd-one-out*, *Mr. X* and *spatial span*. All these tasks involve a motor component in the recall aspect of the task. In other words, the participant has to point to the correct spatial locations.

1.2.4 Episodic Buffer

The episodic buffer serves a role for binding information across informational domains and memory subsystems into integrated chunks (Baddeley, 2000). Besides, it has a small storage capacity which does not rely upon the type of input. The capacity of the episodic buffer is not clearly stated, however, it is believed that the more the information can be bound together in a coherent fashion,

the greater the capacity of the episodic buffer.

The tasks used to assess episodic buffer component shows heterogeneity in the ways in which that aim might be accomplished (Nobre et al, 2013). No clear methodological agreement exists for assessing the episodic buffer independently (Henry, 2010). Besides, Baddeley (2012) claimed that measurement of the episodic buffer is an unresolved problem.

1.9 WORKING MEMORY AND COMPLEX COGNITIVE SKILLS

Past literature has claimed that working memory is greatly associated with cognitive activities – reading, listening, writing, and solving verbal and spatial reasoning problems. It should be remarked that short-term memory (STM) is different from working memory (WM) in relation to learning activities. Notably, the later has stronger relationship with academic learning and with high-level cognitive functions (Daneman & Carpenter, 1980).

1.3.1 Working Memory and Literacy

It has been found that working memory is greatly associated with literacy skills such as: reading comprehension, language comprehension, fluency, spelling or writing.

The past literature has proven that verbal STM and WM are consistently found to be related to literacy skill acquisition in children. Children with good phonological memory skills tend to have large vocabulary knowledge than those with poorer memory function.

Table 1 Summary of research on working memory and literacy skills

Authors	n	Years	Components	Literacy Skills
Daneman & Merikle (1996)	6,179	-	Verbal WM	language comprehension
Leclercq & Majerus (2010)	116	4-5	Verbal STM	vocabulary development
Alloway & Alloway (2010)	98	5-6	Verbal STM; Verbal WM	oral reading; reading comprehension; spelling
Berninger et al. (2010)	449	3	Verbal WM	reading; reading comprehension, handwriting, spelling; written reading; reading comprehension
Cain, Oakhill & Bryant (2004)	65	9-11	Verbal WM	reading; reading comprehension

1.3.2 Working Memory and Numeracy

As for numeracy skills, it includes number operations, strategies, number knowledge, and quantity discrimination. However, certain studies have used general skills of Maths as a term in their research with no further explanation.

To predict Maths competency in children, visuospatial STM and WM play a vital role in it. In certain studies, executive WM is found to be important too.

Table 2 Summary of research on working memory and numeracy skills

Authors	n	Years	Components	Numeracy Skills
Alloway & Passolunghi (2011)	206	7-8	Visuospatial WM; Visuospatial STM	addition & subtraction; number ranking; number production
Bull, Espy & Wiebe (2008)	124	4-8	Visuospatial STM	maths general skills
Zheng, Swanson &	310	9-11	Visuospatial WM;	word-problem solving

Marcoulides (2011)			Verbal WM; Executive WM	
Krajewski & Schneider (2009)	177	8-9	Visuospatial WM	number quantity competencies

1.10 WORKING MEMORY AND SCHOOL ASSESSMENTS

In 2000, Gathercole and Pickering studied the relationship between working memory and school assessments of a group of 7 year old students. They found students who fell below the standard levels of attainment in English (reading comprehension, and spelling) and Maths have low scores on measure of verbal WM and visuospatial STM. Again, in 2004, this relationship was further explored. The results of younger age group (7-8 year old) showed the verbal STM and verbal WM were highly correlated to both English and Maths. As for older age group, Maths was highly correlated with three WM tasks; listening recall, backward digit recall, and wordlist matching (Gathercole et al., 2004).

St Claire-Thompson and Gathercole (2006) also found verbal and visuospatial WM were highly correlated with attainment in both English and Maths in a sample of 11 year old students.

1.11 CONCLUSION

Both verbal STM and WM abilities play crucial roles in predicting students' (4 – 15 year old) literacy achievement. For younger children, verbal STM appears to be more important as literacy skills are developing. Conversely, visuospatial STM and WM are more important in predicting Maths competency of children. Additionally, some studies also found executive skills (e.g. attention, shifting, and planning) are also related to Maths achievement.

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GAMIFICATION: A LOOK INTO THE GAME ELEMENTS THAT DRIVE TOWARDS A MEANINGFUL TEACHING AND LEARNING PROCESS

Mageswaran Sanmugam, Zaleha Abdullah , Hasnah Mohammed,
Norasykin Mohd. Zaid & Baharuddin Aris

ASBTRACT

With the turn of the century, technology usage has improved rapidly in the world. Despite traditional techniques of education still having impact on the students, it cannot be denied the importance of technology in the field of education involving technology. One such implementation is gamification. Gamification is an approach aimed at creating a game-like experience into non-gaming contexts. These elements are points, badges and leader boards. The versatility of this approach enables it to be incorporated into traditional and technology based education. This concept paper will discuss about the elements of gamification that can be used to improve teaching and learning thus guiding the Malaysian education system into the new millennia.

Keywords: Gamification; educational technology; game element

INTRODUCTION

The term gamification was first brought up a game designer Nick Pelling back in 2004, (Rughiniş, 2013) whom tried to use game-like enhanced interface to make electronic transactions such as using the

Automated Teller Machine (A.T.M); making it more attractive and engaging thus creating a game like fun to the transaction. From this came the definition of gamification; which is the "use of game design elements in non-game contexts" (Deterding et al., 2011)

Gamification is used to change behaviour, to educate, or to motivate through game elements such as points, levels, leader boards, achievements, and badges. This type of reward-based gamification has become commonplace in new social media and information-based applications. Thus with the emergence of android and apple devices; a wider population has been introduced to technology while encouraging the rise of new gamers. The current boom has created a generation of "digital natives" (Prensky, 2001; McConnigal, 2010). These are the people whose daily lives are always entangled around technologies (Johnson et al., 2011). The generation in question consists of young adults and teenagers. As these generations grew up in the age of computers and gadgets, getting them motivated in a new fad gets more and more difficult. This is true when it comes to the teenagers at the school whose daily routine may include hours in front of devices using Facebook, commenting on the Twitter, playing with Angry Birds and listening to I-pods. Despite social networking services such as Facebook, Google+ and Twitter was shown to provide motivational affordances in relating the needs for social interaction (Boyd & Ellison, 2007); students feel held back by the boring chalk and talk lessons in the schools. This indirectly affects the students' motivation and engagement level in the classrooms. This leads to boredom and anxiety for these students leading to a detachment to the schools.

Gamification indicates the design outline pointed at giving game-like experiences to users, normally with the objective of influencing users' behaviour (Deterding et al., 2011; Huotari and Hamari, 2012) and according to Edmonds (2011), game mechanics are frequently connected to learning encounters, for instance, helping in the advancement of knowledge and learning collaborative abilities, for example, problem solving and teamwork. Paras and

Bizzocchi (2005) noted that “Games foster play, which produces a state of flow, which increases motivation, and supports the learning process”. A well-designed game mechanics can result in learning experiences that are intrinsically motivating. Paras and Bizzocchi (2005), also stated that Flow is the state of “being completely involved in an action for its own sake”. By being in this state of Flow; the learner is completely focusing on playing the game, therefore completely submerged in the learning. However, despite the benefits, Paras and Bizzocchi (2005) also highlights that a flow experience has got to be challenging as anything not up to par is going to be irritating or ignored. Thus the challenges have to suit the skill levels of the students.

Therefore without proper implementation, it will not succeed. The discussion of this paper will focus on the elements that will assist to reach high levels at the flow zone using gamification; thus directly pushing up the motivation and engagement levels.

LITERATURE REVIEW ON GAMIFICATION

Several latest research of gamification in the context of education was chosen and reviewed to see the purpose of the research. Table 1 shows the meta-analysis of this research.

Table 1 A critical analysis of gamification

Research	Purpose	Analysis Review
Thom, J., Millen, D. R., Dimicco, J., & Street, R. (2012). Removing Gamification from an Enterprise SNS	Analyzing the effects of removing aspects of gamification from an Enterprise Social Network System (SNS)	The point’s scheme influenced the contribution levels at first then later gradually it went down; thus showing the discontinuation of game like mechanics will have motivational impact on the users, especially the new users. It was suggested that a new form of game mechanics to ensure continuous

		motivation.
Nicholson, S. (2012). A User-Centered Theoretical Framework for Meaningful Gamification	Creating a meaningful gamification framework	A meaningful gamification succeeds if the needs of the users are prioritized over the needs of an organization. Thus resulting in long-term and deeper engagement among users. Focusing on the game mechanisms creates a false scenario in achieving goal as the positives of games lies in the fun of play and not the points itself.
Dominguez, A., Saenz-De-Navarrete, J., De-Marcos, L., Fernandez-Sanz, L., Pages, C., & Martinez-Herraiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes.	Empirical study at the tertiary level of education in the subject of "Qualification for users of ICT" where gamification was used in giving the students optional exercises that is meant to help the student's grade in the final exams.	The design of educative exercises has to embrace from the very beginning. The concept of gameful design to make them more interesting for students. The quantitative analysis suggests that cognitive impact of is not very significant. Adaptation of cognitive characteristics of games cannot be infused in the traditional educative content without entering in the field of serious games.
Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Engaging engineering students with gamification	The purpose of this empirical study is to look into the prospects of engaging engineering students with gamification.	The findings showed engagement improved, through course attendance and the number of posts made by the students. No improvement in the student grades. There was a notion of meaningless gamification; challenges were bypassed as it was perceived to be of no use. The users felt the need of Avatars that to create networking.
Glover, I. (2013). Play As You Learn: Gamification as a Technique for	Gamification is a concept that can be used to make learning more engaging	When considering the benefits, motivation levels has to be identified; as introducing a reward system in an optimized environment has a potential to disrupt their flow

Motivating Learners.		and results in rewards dependency, and demotivation if the taken away. When planning a learning activity, gamification should be done and planned at the same stage. The use quality based examples; giving ratings and feedback; rather than just quantitative elements such as rewards and points.
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DISCUSSION

Based on the analysis, it can be suggested that the elements of gamification have the potential to increase student's motivation and engagement. However, it is crucial to identify their levels of motivation as introducing a reward system in an optimized environment has a potential to disrupt flow; resulting in dependency on the rewards, and demotivation if the reward system is taken away. These motivation levels are distinguished into four categories (Marczewski , 2013):

- 1) Relatedness-the users want to have social connection and feel belonged in a group.
- 2) Autonomy- the users want to be in control, and prefer freedom in choosing their path.
- 3) Mastery- the users prefer personal development.
- 4) Purpose- the users want to know the reason why they are doing these tasks, altruism.

Finally the reward too needs to be achievable and desirable to push up the motivation level, yet it has to be limited to create a sense of achievement in receiving it. Meaning in creating a sense of achievement the students require more than receiving points. A different type of rewards needs to be granted to the students as they may feel bored or unappreciated from achieving the same complimentary badges as others. Therefore there should be a special exclusive reward allocated for the best of the best. Besides

that, to make them feel more appreciated, peer compliment can be encouraged. Meanwhile as found by Thom, et al. (2012), points element in a gamified system can have negative impact if its take away from an already existing system. This was highlighted by Zichermann (2011) whom states that one cannot stop the external motivators if the users are used to it. This was more evident in new users into a certain system as they may only be getting immersed in the system, with the points being early boost. Before they get to know the system, they are evidently demotivated by losing the extrinsic motivational factor, which are the point's elements.

Despite this, all the other research, showed that implementation of gamification has positive impact on the users' motivation (Spence et al., 2012; Dominguez et al.2013) whether it's through online or traditional method of gamification. On the aspects of engagement, we can see from the research by Barata, et al. (2013) showed the student's participation can increase thus certifying the improvement in engagement, yet what comes to mind is that there is no improvement in grades despite the use of gamification. This is also evident in another research by Dominguez et al.(2013). Yet this contradicts with findings stated by Zichermann (2011), who states that "in education, game mechanics are proving to be very useful tools within the classroom". Zichermann (2011) also found that by incorporating games into the curriculum by using leader boards and social challenges showed a noticeable improvement in reading and math. Therefore, it cannot be concluded yet that grades cannot be influenced by the gamified system. Before gamification elements are infused in teaching and learning, one has the see how to create a meaningful gamification. Nicholson (2012) stated in the research that a meaningful gamification will only succeed if it puts the needs of the users first over the needs of an organization. When this occurs, users will have a positive experience which results in a long-term and deeper engagement among participants. This is important as the biggest problems that will arise when the implementation looks into teaching and learning process is that gamification has to bypass the

needs of the organization and look at the needs of the users. The organization in the context of Malaysian education is the Ministry of Education, and the schools, while the users are the students. Though it may have been a problem with the old education system; yet with the current school based assessment that allows the teachers to implement and carry out teaching and learning process unimpeded, meaningful gamification can be implemented. Focusing only on the game mechanisms will create a false scenario in achieving a goal. The positives of game experience lies in the fun of play and not the points itself. Yet, according to Glover (2013), when considering whether gamification can benefit a group of students, it is crucial to identify their levels of motivation and introducing a reward system in an optimized environment. This is because the rewards elements have a potential to disrupt their flow and resulting in dependency on the rewards, and demotivation if the reward system is taken away as seen in the research by Thom, et al. (2012). Gamification should use more of quality based examples; such as students giving ratings and feedback among themselves; rather than just quantitative elements such as rewards and points. Utilizing external rewards such as points without matching them to the underlying exercises makes an empty gamification experience and instils a negative feeling in the users. This will disrupt the flow of the users as the challenge does not tally with the skills. We can see a few problems that can interrupt a meaningful teaching and learning process using gamification; for example the creation of unhealthy competition among students whom strive to collect points, badges and are willing to do anything to finish on top of the leader board. This leads to an unwanted scenario that may create attrition among weaker students. Thus to avoid this, one has to make sure elements suits the students and the environment. For example as suggested by Deterding (2011), the placement of game elements, such as leader board should not show the rankings according to numbers but instead show the users the person ranked one slot above and below; which allows the user to challenge the person ranked higher and avoid being overtaken by the person

below the user.

CONCLUSION AND IMPLICATIONS

Based on the findings above we can see the elements that drive gamification, which is points, badges and leader boards tend to influence motivation and engagement among its users. This can be important when it comes to gamifying teaching and learning, as these elements makes sure that the students are able to follow the lesson carried out by the teacher. Yet despite lacking evidence that gamification helps when it comes to cognitive improvement, but one has to take into account the amount of participants, the duration of time, the capability of the students and whether it was a meaningful gamification before coming to a conclusion about the effectiveness of the elements in gamification. Therefore a careful planning, which gives emphasis on motivation and engagement are needed before using the game elements in the system and because the implementation can happen in both traditional and technology based classroom, gamification can pave a path to the future of a meaningful teaching and learning process in Malaysia.

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FLIPPED CLASSROOM: A NEW PARADIGM IN SECONDARY EDUCATION

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ABSTRACT

Flipped classroom is one of the 21st century learning using technology as an intermediary in Learning and Teaching. Flipped classroom method is a student-centered learning that emphasizes student engagement and active learning. In the Malaysian context, the study of flipped classroom is very limited, especially in schools level, as it is one of the new and current pedagogical methods. The main advantage of flipped classroom is the optimal time allocation for students' learning activities. Besides, the use of technology in classroom methods helps students to learn in a self-paced environment. This paper will describe briefly on the previous studies about the potential of the implementation of flipped classroom towards secondary education. Early analysis shows that flipped classroom have advantages and challenges in its implementation, but it also has the potential to increase student achievement, especially at school level.

Keywords: Flipped Classroom; Technology in education; Teaching and learning; Active learning; Student centered.

INTRODUCTION

Education curriculum is a system that needs to be done to ensure that changes over time produce generations that are competitive internationally. Thus, the study of a country's education curriculum should be an ongoing and consistent (Flumerfelt and Green, 2013).

Educating the next generation is a challenge that needs to be implemented starting from the school level (Mukherjee, 2013). Learning patterns of students at the university level is greatly influenced by the way of teaching in schools. As the curriculum requirement grows, teachers need to make more efficient use of class time. Teachers also play an important role to ensure that their teaching methods fit to the current needs of students' learning.

Flipped classroom is an appropriate and timely learning pattern of the latest 21st century learning style. Flipped classroom is also a student-centered method that emphasizes the use of technology in teaching and learning process.

Published Researches on Flipped Classroom in School

In recent years, many studies have been conducted on the pedagogy of teaching and learning. The study should be done on an ongoing basis in an effort to study the curriculum needs. A pedagogical aspect that gets the first place at the international level and is proven empirically is flipped classroom.

Studies on flipped classroom approach have been conducted in other countries especially in the United States (Baker, 2000; Stone, 2012; Strayer, 2012; Shimamoto, 2012; Carver *et al.*, 2013; Rutherford & Rutherford, 2013; Siegle, 2013) before starting to be explored in other countries such as Canada (Bergmann and Sams, 2009), Australia (Butt, 2014) and Singapore (Pang and Yap, 2014). However, this paper only focuses on the implementation of flipped classroom at the school level. The authors focused on the

secondary education as it is the scope of the study. Secondary school was selected because there is a gap in this area.

Flipped classroom (Baker, 2000) or also known inverted classroom (Lage et al., 2000), is one of the student-centered learning approach. Flipped classroom was introduced in 2000 to a group of university students (Baker, 2000). Originally flipped classroom methods was implemented at the university level in the fields of technology before it has been used widely in schools in the field of Science, Technology, Engineering and Mathematics or STEM (Herreid and Schiller, 2012; Hamdan et al., 2013).

The selected previous studies on flipped classroom were obtained from different electronic journal databases taken from 2009 until 2014. Although the implementation of the flipped classroom studies involves various stages of education, discipline and dimensions, this paper reviews the implementation of the flipped classroom at the school level, as shown in Table 1.

Table 1: Published flipped classroom researches in school

Author	Discipline	Dimension
Flumerfelt and Green (2013)	Mathematics Science Social Science English	Curriculum development
Fulton (2012)	Mathematics	Student achievement
Siegle (2013)	Technology	Student achievement
Bergmann and Sams (2009)	Science	Student achievement

Based on Table 1, the study shows that flipped classroom has been applied in the school as early as 2009 in different areas. Flumerfelt and Green (2013) have implemented a different approach in terms of changes in the school curriculum. Flumerfelt

and Green (2013) considered the implementation of the latest pedagogical methods such as the method flipped classroom, is one of the pedagogical changes that is need to be injected into the school curriculum. The findings by Flumerfelt and Green (2013) showed an increase in research and achievement in all subjects that was studied.

The use of technology in teaching and learning process has a positive impact on education system. This is because technology can increase student motivation. A study by Fulton (2012) in one of the schools in the United States has proven this statement. Bryon School had suffered serious financial problems and as a result, the school was forced to make drastic changes to the school curriculum. Success was in favor of the school as it showed a very impressive performance until 2011, where Bryon School was awarded the School of Distinction for Mathematics by Intel.

Flipped classroom is a flexible method that can be used in a variety of disciplines and levels of education. At the school level, this method is not limited to mainstream students as it proves that the method is feasible for special students and also for gifted students (Siegle, 2013).

Flipped classroom has started to get attention after being popularized by two chemistry school teachers from abroad, namely Bergmann and Sams (2009) whom used the technology of vodcast and podcast inside the flipped classroom learning process. Compared with previous studies, the approach by these teachers has opened the eyes of many researchers on the implementation of flipped classroom, especially in terms of the use of technology. It is with no exaggeration to note that the study by Bergmann and Sams (2009) has promoted the name of the flipped classroom. The use of technology has also opened opportunities for third parties such as Khan Academy and YouTube to expand the production of educational materials such as free videos and online activities. Digital materials and online activities make it easier for teachers to implement the flipped classroom method without burdening teachers to develop their own teaching materials.

Flipped classroom is synonym with the use of technology to meet students' learning style. Technology is defined as the use of digital resources such as video, audio, vodcast and podcast which can be use online or offline. Moreover, the method of flipped classroom also helps create in creating an active learning environment (Siegle, 2013). The uniqueness and advantages of flipped classroom is its two-phase method that provides a platform for students to learn self-paced and to study the rate of self-build knowledge through experience or through the guidance of a teacher and their competence friends (Lowell et al., 2013).

Flipped classroom is generally seen as capable of improving students' achievement, improve communication and promote teamwork (Herreid and Schiller, 2013). This means flipped classroom methods can be applied and implemented effectively in various fields, especially in the field of education.

DISCUSSION

Based on the previous studies, the authors found that the implementation of flipped classroom provides significant implications for students' achievement. Technology is an important element in flipped classroom and also instrumental in helping teachers to implement the teaching and learning process more effectively. Previous studies also showed that there are several challenges that need to be overcome to ensure that the objectives of flipped classroom are achieved.

CONCLUSION

Based on all the findings presented, it can be concluded that the method flipped classroom have a positive impact on student achievement. Although there are several challenges in the implementation of the flipped classroom, there are high potential for

implementation of different groups of students. Flipped classroom methods also seen fit to be integrated into a variety of disciplines such as Science, Technology, Engineering, Mathematics and social sciences. Moreover, flipped classroom is also suitable to be applied in secondary schools and tertiary institutions. Flipped classroom implementation methods will bring enormous implications for education curriculum. Behind the use of technology in the classroom method is consistent with the requirements of the Ministry of Education (MOE) to leverage information technology in teaching and learning process. Existing conventional teaching methods need to be transformed to ensure that the country's education system is able to move along the latest and competitive learning. Flipped classroom is one of the methods with potential to realize this vision.

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KERANGKA KONSEP KEMAHIRAN PROSES SAINS ASAS PRASEKOLAH MENERUSI APPS BERDASARKAN STRATEGI PEMBELAJARAN KOLABORATIF DALAM PERSEKITARAN AUTENTIK

Mohd Amerul Akmal Mohd Yunos, Noor Azean Atan & Norazrena
Abu Samah

ABSTRAK

Salah satu faktor utama yang menyebabkan proses pembelajaran bermakna tidak dapat dicapai dengan sepenuhnya oleh para pelajar samada diperingkat sekolah mahupun Institusi Pengajian bagi sesetengah pembelajaran kursus seperti sains dan matematik adalah salah fahaman konsep. Permasalahan yang sama turut berlaku pada peringkat prasekolah. Kesan daripada itu, wujud permasalahan dalam proses pembelajaran antaranya adalah kecenderungan sebahagian guru untuk menggunakan kaedah imaginasi dan andaian. Hal dilihat kurang membantu dalam pembentukan fahaman dalam diri pelajar untuk memahami sesuatu konsep sains dan seterusnya sukar mengaitkannya dengan kehidupan sebenar. Disamping itu, suasana pembelajaran yang menggalakkan para pelajar senantiasa berkolaborasi dalam proses pembelajaran serta saling bekerjasama dan berkongsi maklumat harus dididik dari peringkat prasekolah lagi. Selain itu, permasalahan dari segi penyediaan kemudahan ICT seperti pengaksesan kepada internet dan aplikasi teknologi multimedia yang kurang mampu disediakan oleh pihak sekolah turut

menyukarkan para guru untuk merancang aktiviti pembelajaran yang lebih menarik sejajar dengan perkembangan teknologi hari ini. Justeru sebuah kajian perlu dilaksanakan bagi tujuan untuk merangka sebuah aktiviti pembelajaran yang mampu menyokong kepada peningkatan kefahaman pelajar terhadap pembelajaran mereka melalui sebuah persekitaran pembelajaran yang berdasarkan kepada situasi sebenar dan bermakna sekaligus memupuk pelajar agar senantiasa berkolaborasi dalam proses pembelajaran mereka sehingga mampu menyokong kepada pembentukan kemahiran proses sains asas pelajar. Berlandaskan kepada keperluan ini, maka kajian mengintegrasikan strategi pembelajaran kolaboratif dalam persekitaran autentik, dengan pengimplementasian bersama teknologi berkomputer iaitu melalui Apps Autentik Kolaboratif Skrin Sentuh Sains (AKSES) yang memberi penekanan serta mempraktikkan kemahiran proses sains asas pelajar (memerhati, mengelaskan dan berkomunikasi), dalam menyokong kepada peningkatan tahap kefahaman dan pencapaian pelajar.

Kata kunci: App; Strategi Pembelajaran Kolaboratif; Persekitaran Pembelajaran Autentik; Kemahiran Proses Sains; Prasekolah.

1.1 PENGENALAN

Sempadan dan halangan yang wujud bagi setiap pelajar untuk mendalami maklumat yang disampaikan oleh guru adalah bergantung kepada strategi pengajaran yang diguna pakai serta peruntukan atau pengagihan sesuatu maklumat untuk disampaikan di dalam sesuatu masa. Setiap guru perlu peka terhadap persekitaran sekeliling mereka samada persekitaran secara semulajadi mahupun persekitaran yang wujud kesan daripada interaksi antara pelajar dan guru tersebut. Persekitaran semulajadi di sini bermaksud emosi dalaman bagi setiap pelajar atau guru yang pada kebiasaannya di bawa dari luar dan masuk ke dalam bilik darjah (Latham & Carr, 2012). Perkara ini mampu merosakkan

sistem pembelajaran dan pengajaran (P&P) yang dirangka rapi oleh guru pada awalnya serta seterusnya berkemungkinan akan mendorong kepada permasalahan lain seperti salah faham konsep dan interpretasi.

1.2 LATAR BELAKANG MASALAH

Sebagaimana yang diutarakan oleh King (2010) dalam kajiannya menyatakan bahawa wujudnya juga salah faham konsep berkaitan beberapa subtopik utama pembelajaran seperti dalam matapelajaran sains diperingkat persekolahan. Permasalahan ini turut dibincangkan oleh Gooding dan Metz (2011) dalam kajian mereka yang menyatakan bahawa kesalah fahaman konsep dalam proses P&P akan mengundang kepada pelbagai permasalahan lanjutan seperti pelajar tidak dapat menguasai pembelajaran. Pelajar turut mengalami kesukaran untuk memahami topik-topik seterusnya sekiranya wujud salah faham konsep dari awal pembelajaran lagi.

Selain itu, wujud juga permasalahan lain semasa proses pembelajaran dan pengajaran berlangsung seperti pembelajaran menggunakan andaian dan bayangan (Noor Azean, 2012). Kaedah ini sering digunakan oleh guru baru dengan alasan faktor kekangan masa dan kurang menguasai subtopik yang dipelajari (Caliskan, 2012). Kesan daripada itu, para pelajar tidak mampu untuk menguasai kemahiran-kemahiran yang ingin diterapkan semasa proses pembelajaran dan pengajaran seperti kemahiran insaniah yang diterapkan dalam beberapa program diperingkat pengajian tinggi, kemahiran proses sains pada peringkat sekolah rendah dan sebagainya.

Justeru itu, kepintaran seseorang guru untuk memikirkan kaedah yang paling berkesan dan sesuai untuk diguna pakai ke dalam proses P&P adalah sangat penting dan perlu diperincikan secara mendalam bagi mengatasi permasalahan yang wujud di dalam ruangan bilik darjah agar ianya dapat diatasi secara berperingkat. Strategi pembelajaran dan pengajaran yang diguna pakai perlulah

disertakan dengan teori-teori pembelajaran yang wujud masa kini bagi membantu para guru untuk membentuk ruang pembelajaran yang efektif, mereka bentuk instruksi dengan lebih berkesan, berdasarkan masalah sebenar dan bukannya andaian serta berstruktur (Neo, 2010). Sebagai contoh pembelajaran berdasarkan kepada situasi sebenar dan realiti mampu memberi pendedahan kepada pelajar bagaimana sesuatu konsep itu berlaku dan diaplikasikan pada kehidupan sebenar (Latham & Carr, 2012). Merujuk kepada Noor Azean Atan (2012), pembelajaran bermakna atau lebih dikenali sebagai *meaningful learning* mampu memberi peluang kepada pelajar memahami masalah yang berlaku itu sepertimana dalam dunia sebenar. Sejalan dengan pernyataan oleh Ozverir dan Herrington (2011) iaitu pembelajaran autentik memberikan satu ruang pembelajaran yang sebenar seperti dalam dunia seharian pelajar.

Menurut Wilson dan Schwier (2012), pembelajaran autentik adalah relevan dan berhubung terus dengan dunia sebenar serta memberikan satu proses pembelajaran yang realiti dan semula jadi. Guru-guru tidak perlu menggunakan kaedah bayangan atau andaian dan sebaliknya perlu memberikan contoh-contoh yang wujud dan sebenar. Ianya dilihat sangat berkesan dalam membantu para pelajar memahami maklumat yang disampaikan dalam proses P&P dengan mudah terutamanya bagi mata pelajaran sains. Walau bagaimanapun, bagi menjayakan sesebuah pembelajarn bermakna iaitu sebuah persekitaran pembelajaran yang autentik, pelajar juga harus didedahkan juga dengan sebuah aktiviti pembelajaran yang menggalakkan pelajar itu saling berkomunikasi dan bertukar pandangan antara satu sama lain (Dickers, 2013b; Tham & Tham, 2013; Woodley-Cook, Prabhudesai, & Moloney, 2013)

Justeru wujud strategi pembelajarn lain yang mampu meningkatkan tahap komunikasi para pelajar dan kemahiran-kemahiran lain semasa proses P&P berlangsung seperti strategi pembelajaran kolaboratif. Menurut Tham dan Tham (2013), pembelajaran kolaboratif merupakan salah satu strategi pembelajaran yang paling efektif dalam membentuk kemahiran

komunikasi terhadap para pelajar. Strategi ini menyokong para pelajar untuk membantu rakan-rakan lain semasa proses P&P yang sedang berlangsung dan secara tidak langsung mereka akan saling berkomunikasi antara satu sama lain. Secara tidak langsung dengan pengimpkementasian suasana pembelajaran secara kolaboratif maka, ianya mampu untuk meningkatkan salah satu tahap penguasaan kemahiran proses sains iaitu kemahiran berkomunikasi.

Para guru juga perlu memikirkan kaedah penyampaian maklumat pengajaran yang lain selain kaedah tradisional yang biasa digunakan bagi menarik minat para pelajar terutamanya kanak-kanak untuk memahami sesuatu pembelajaran dengan mudah dan sistematik dalam menyokong kepada pembelajaran dalam persekitaran autentik serta pembentukan pembelajaran kolaboratif. Sejarar dengan perkembangan teknologi, ianya dilihat mampu membantu para pelajar untuk menguasai proses P&P dengan cepat (McManis & Gunnewig, 2012). Menurut Komis *et. al* (2013), terdapat sebahagian besar guru yang kurang proaktif dalam mengaplikasikan penggunaan teknologi di dalam proses pembelajaran dan pengajaran bersama para pelajar. Menurut kajian itu lagi, penggunaan teknologi di dalam kelas mampu meningkatkan tahap fokus dan minat pelajar untuk memberikan tumpuan secara menyeluruh sepanjang proses pembelajaran dan pengajaran sedang berlangsung. Antara contoh aplikasi penggunaan teknologi di dalam proses pembelajaran dan pengajaran adalah pembelajaran berasaskan teknologi web, penggunaan multimedia serta yang kini yang semakin berkembang adalah penggunaan teknologi skrin sentuh yang lebih dikenali sebagai aplikasi mudah alih (*apps*).

Jika dilihat kepesatan dunia pendidikan masa kini menyaksikan pembangunan penggunaan *apps* di dalam proses pembelajaran dan pengajaran. Hasilnya, kajian yang dilaksanakan oleh McFarlane (2013) dan Dikkers (2013a) mendapati pembelajaran yang mengaplikasikan penggunaan *apps* di dalam kelas memberikan kesan yang sangat positif terhadap para pelajar terutamanya dari segi tahap pencapaian pembelajaran. Dalam kajian yang dijalankan oleh Higgins *et. al* (2012) menyatakan bahawa

pembelajaran menggunakan *apps* sesuai untuk diaplikasikan bersama strategi pembelajaran kolaboratif. Hasil daripada kajian tersebut mendapati wujud peningkatan dari segi pencapaian dan juga hubungan dua hala antara para pelajar sepanjang proses pembelajaran dan pengajaran berlangsung. Justeru itu, lantaran daripada kelebihan yang ada dalam penggunaan *apps* di dalam kelas maka ianya dilihat amat sesuai untuk pembelajaran kolaboratif dan seterusnya ianya juga mungkin juga sesuai untuk meningkatkan kemahiran proses sains pelajar.

Justeru itu, para guru perlulah mempertimbangkan keperluan dan kekurangan di dalam proses pengajaran dan pembelajaran bagi memastikan strategi pengajaran dan pembelajaran yang akan diguna pakai bersesuaian serta tidak akan membebankan tahap kognitif pelajar. Hal ini mampu menghasilkan suasana pembelajaran yang efektif dan berstruktur disamping dapat mengaplikasikan kuasa dan kelebihan perkembangan teknologi masa kini ke dalam sistem pengajaran dan pembelajaran (Auzar, 2012). Selain dapat meningkatkan modal insan dan pelajar berwawasan, ianya juga mampu membentuk satu suasana pembelajaran yang baru terhadap pelajar. Dunia teknologi dan sistem pendidikan sudah tidak menjadi asing lagi masa kini lantaran perkembangan kajian yang berasaskan dua dunia ini ke dalam satu sistem yang jitu adalah sangat digalakkan.

Pengintegrasian pembelajaran berdasarkan dunia sebenar iaitu yang lebih dikenali sebagai pembelajaran autentik dengan menggalakkan pembelajaran yang menyokong kepada kolaborasi dalam kalangan pelajar harus diberi perhatian. Pengimplementasian bersama penggunaan teknologi berkomputer serta internet masa kini yang banyak menyumbang kepada keberkesanan sesebuah pembelajaran haruslah perlu direka bentuk agar ianya dapat membantu dalam peningkatan pemahaman pelajar dalam sesebuah pembelajaran (Noor Azean Atan, 2012) serta secara tidak langsung menyokong kepada pembentukan kemahiran proses sains dalam kalangan pelajar sepertimana yang telah dibincangkan. Sebagaimana dalam kajian beberapa penyelidik terdahulu (Lati *et al.* , 2012 dan

Turiman *et al.*, 2012), hal ini sebenarnya dilihat mampu membantu dalam meningkatkan kemahiran yang perlu diperolehi oleh pelajar yang merangkumi pembelajaran prasekolah yang perlu menerapkan kemahiran proses sains tersebut.

Oleh demikian, berdasarkan kepada objektif kajian yang telah digariskan oleh pengkaji iaitu 1) Mereka bentuk aktiviti pembelajaran Sains prasekolah berdasarkan strategi pembelajaran kolaboratif dalam persekitaran autentik menerusi aplikasi mudah alih (Autentik Kolaboratif Skrin Sentuh Sains - AKSES) 2) Menilai keberkesanan aplikasi AKSES berdasarkan kepada strategi pembelajaran kolaboratif dalam persekitaran autentik dari aspek mempraktikkan kemahiran proses sains asas (Memerhati, Mengelaskan, Berkomunikasi), dan tahap pencapaian pelajar 3) Mendapatkan pandangan pelajar terhadap penggunaan aplikasi AKSES dalam mata pelajaran Sains prasekolah 4) Mendapatkan corak penguasaan kemahiran proses sains pelajar berdasarkan pembelajaran kolaboratif dalam persekitaran pembelajaran autentik 5) Mendapatkan profil aktiviti pembelajaran sains prasekolah berdasarkan strategi pembelajaran kolaboratif dalam persekitaran autentik terhadap kemahiran proses sains asas, maka sebuah aplikasi mudah alih (*apps*) akan dibangunkan berdasarkan strategi pembelajaran kolaboratif dalam persekitaran autentik dalam menyokong kepada pembentukan kemahiran proses sains asas prasekolah dalam kalangan pelajar-pelajar prasekolah seterusnya membantu dalam peningkatan pemahaman dan pencapaian mereka. Namun, dalam kertas kerja konseptual ini, penyelidik tidak membincangkan reka bentuk pembangunan aplikasi mudah alih ini serta keberkesanannya.

1.3 PEMBELAJARAN KOLABORATIF DALAM PERSEKITARAN AUTENTIK BERBANTUKAN TEKNOLOGI APPS

Berdasarkan kajian oleh Tervakari and Silius (2011), penggunaan

peralatan teknologi ini dilihat berupaya untuk membentuk satu proses pembelajaran pelbagai makna (maklumat) dalam konteks dunia sebenar berdasarkan kepada pengalaman pelajar-pelajar tersebut dalam situasi autentik atau situasi yang sebenar yang menggalakkan kepada pembelajaran dalam dunia realiti.

Seperti aplikasi penggunaan komputer, teknologi skrin sentuh juga turut menyokong pelaksanaan aktiviti autentik dalam persekitaran yang sebenar di mana para pelajar boleh mencari pelbagai maklumat di hujung jari sahaja dalam tempoh beberapa saat di mana sahaja tanpa had ruang dan sumber tenaga elektrik. Jika persekitaran pembelajaran berbantuan teknologi skrin sentuh ini dilaksanakan secara efektif, ianya mampu membenarkan dan menggalakkan pembelajaran yang lebih menarik untuk menyelesaikan sesuatu permasalahan (Mayberry *et al.*, 2012). Menurut Noor Azean Atan (2012), keadaan ini mampu mendokong pelaksanaan aktiviti autentik dimana melalui persekitaran pembelajaran autentik, pelajar diberi peluang untuk mengenal pasti dan mengkaji tugas dari pelbagai perspektif serta menggunakan pelbagai sumber bagi menyelesaikan permasalahan tersebut.

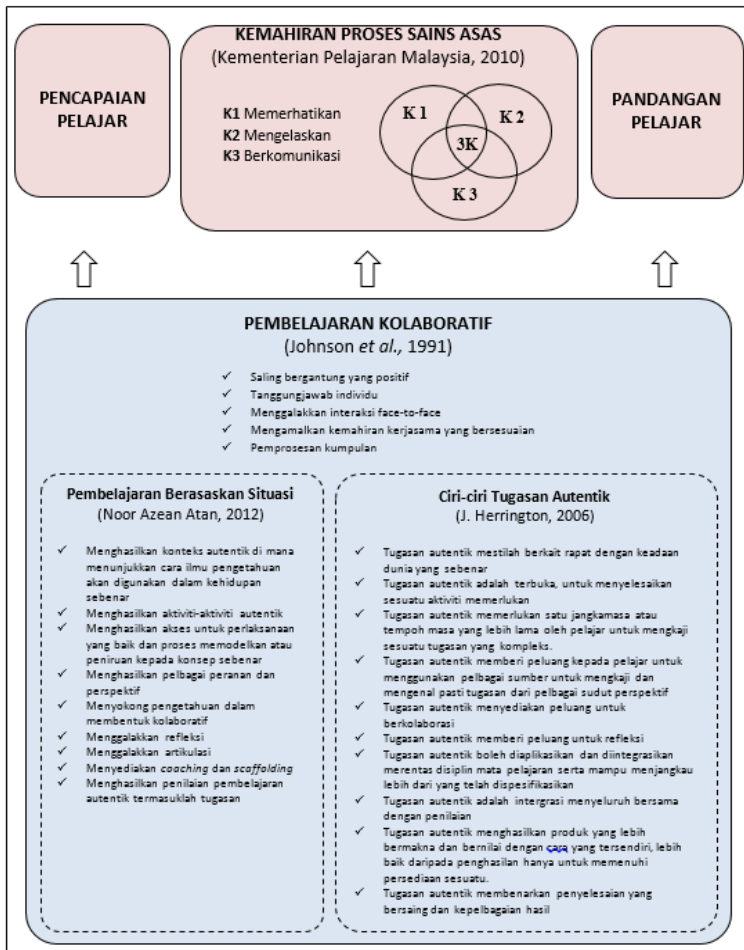
Selain itu menerusi penggunaan teknologi skrin sentuh dan elemen multimedia ini, maka persekitaran pembelajaran yang memberikan penekanan terhadap aspek pembelajaran dunia sebenar dan realistik akan mampu dibangunkan dengan jayanya (Lombardi, 2007a; Noor Azean Atan, 2012). Pelajar berpeluang untuk mengalami proses perkongsian pengalaman pembelajaran dengan menghubungkan antara teori dengan amali menerusi persekitaran pembelajaran berasaskan teknologi ini dengan rakan-rakan lain di dalam kelas. Oleh yang demikian, wujud satu lagi proses pembelajaran kolaboratif yang mana ianya turut menggalakkan proses kerjasama setiap pelajar dalam proses pembelajaran (Cullen, Kullman, & Wild, 2013).

Manakala menerusi pembelajaran kolaboratif, pelajar-pelajar berpeluang memperolehi manfaat apabila didedahkan kepada pelbagai komen dan pandangan daripada rakan-rakan mereka dengan pelbagai latar belakang keluarga. Dalam persekitaran

pembelajaran kolaboratif, para pelajar akan dicabar dengan kedua-dua emosi dan sosial kerana mereka akan mendengar dan menerima pelbagai perspektif yang berbeza daripada rakan-rakan serta dikehendaki untuk mempertahankan dan menyuarakan idea-idea mereka sendiri (Cheong *et al.*, 2012). Kesan daripada itu, pelajar akan mula membina rangka kerja konsep yang unik mereka sendiri dan tidak bergantung semata-mata kepada guru sahaja. Rajah 1 menunjukkan kerangka konsep bagi kajian yang melibatkan strategi pembelajaran kolaboratif dalam persekitaran autentik bagi pembentukan kemahiran proses sains asas prasekolah menerusi teknologi *apps*.

1.4 KESIMPULAN

Berdasarkan kepada teori-teori dan strategi pengajaran, maka kajian ini menggabungkan bersama strategi P&P ini dalam mereka bentuk sebuah persekitaran pembelajaran yang fleksibel dan bermakna kepada pelajar dan guru. Pembangunan persekitaran pembelajaran yang dirangkakan adalah menerusi aplikasi AKSES yang digunakan sebagai bahan bantu mengajar, menjadi media alternatif kepada guru dalam menyampaikan pengajaran dan seterusnya memberi satu anjakan proses pembelajaran kepada pelajar menerusi penggunaan teknologi skrin sentuh ini semasa di kelas. Kajian ini telah memilih persekitaran pembelajaran autentik dan strategi pembelajaran kolaboratif sebagai asas dalam mereka bentuk aplikasi AKSES yang telah dibangunkan. Pemilihan ini bagi menyokong kemahiran proses sains asas bagi pelajar-pelajar prasekolah sekaligus membantu dalam meningkatkan pencapaian dan minat pelajar terhadap mata pelajaran Sains tersebut.



Rajah 1 : Kerangka Konsep Kajian

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DEVELOPING ONLINE COMMUNITY: WHERE DO TEACHER PRACTICES FIT IN?

Farhana Diana Deris & Abdul Rahim Salam

ABSTRACT

With the heavy emphasis and reliance on community at the workplace compounded with educational studies revealing its potentials, 'community' has gained the attention of scholars who investigate 'what works best' in structuring and affording students' desired education. Therefore, to support the efforts in finding the right mechanism to nurture community in the academic domains, this study aims to provide insights into teacher practices in relation to the online community that exists in the OLE. With a focus on teacher practices, students' discussion threads (DTs) in an online learning environment called s.a.s.s.y., responses to survey and interview questions were explored to answer the following questions: (1) How did the community interact in the online forum?; (2) How did the community help each other in their learning?; and (3) How did the community perceive their learning environment? This study adopted a descriptive approach of content analysis and statistical analysis. The findings of this study revolve around sustaining community interaction, helping community learn, and preparing learning environment.

Keywords: online community, teacher practices, online learning, interaction

1.1 INTRODUCTION

Developing communities is one of the main emphases tertiary institutions have due to the potentials of community. Its potentials in the academic domain or professional domain have been established by Brindley, et al. (2009), Gratton and Erickson (2007) and Palloff and Pratt (2005). Other researchers have also indicated that community can enhance quality of interaction (Salmon, 2004) because it enhances “the flow of information among all learners, the availability of support, commitment to group goals, cooperation among members, and satisfaction with group efforts” (Rovai, 2001:33). Picciano (2002) has also pointed out it affects academic performance and coursework completion. The professional domains also capitalise on community diversity in terms of knowledge and experience to realise workplace’ initiatives (Adler and Heckscher, 2006). With the provision of online learning environment (OLE) at tertiary institutions, developing a community is becoming more viable because teachers are able to plan and orchestrate instructional experience, assess and make changes *in situ* to support the development of online community so that interaction among students are promoted and students’ interdependence on each other are nurtured. With this in mind, this research set out to understand the development of online community in OLE and the teacher practices in relation to the respective online community.

It is believed that the panacea to realise the potentials of community is teacher practices; it is the teachers who “empower” the community (Coppa, 2004), who are “responsible for creating the container” for instructional experiences (Palloff and Pratt, 2004) and are accountable in creating, nurturing and sustaining community (Rovai and Wighting, 2005). Teachers cannot assume automatic community building just because students are working in groups (Palloff and Pratt, 2004). Teachers have also been cautioned that poor quality of community (incoherent, inactive and shallow discussions) can happen in the OLE (Deris and Tan, 2014; Hew, et al., 2010). In fact, studies have shown that teachers’ active and on-

going involvement is indispensable in fostering desired community (Deris, et al., 2012a; Ke, 2010; Shea, et. al., 2006).

McKerlich, et al. (2011) suggested teachers' involvements or teacher practices are both 'direct and indirect' and are related to "the design, direction and facilitation". Supporting this, Deris, et al. added that these practices are both planned and spontaneous (2012b) and include actions that are seen by students as passionate, attending to and participating in the learning process (2011). In this study, these views define 'teacher practices'. Meanwhile, 'online community' is defined as students "who interact and engage in shared activities, help each other, and share information with each other" (Wenger, 2006). In a recent study by Deris, et al. (2014), it was found that even in a teacher-less online environment, community can be developed. Thus, with the premise that teacher practices can support the development of a community, it is important to explore community in an online environment with a teacher. This will provide insights into teacher practices in relation to the online community that exists in the OLE.

1.2 METHODOLOGY

Focusing on exploring online community with focus on teacher practices, this study pursued the following questions:

1. To what extent did the online community interact with one another? Was the interaction sustained?
2. How did the community help each other in their learning?
3. How did the community perceive their learning environment?

Twenty two undergraduates enrolled in Teaching English as a Second Language bachelor degree programme were involved as participants. This selection was based on convenience sampling, of which the participants who fit the criterion required are readily available. Adopting Wenger's definition of 'community' mentioned earlier, the criterion for the selection of participants was 'shared activities'.

The OLE in this study, s.a.s.s.y., or “simply another social space for the young” was introduced to the undergraduates as “a virtual discussion room for bold and vibrant TESLIANs to share, discuss and learn from one another...”. s.a.s.s.y. was implemented for seven weeks and based on teacher practices derived from previous studies (Deris, et al., 2012b & 2011).

Capitalising on the strengths of both quantitative and qualitative approaches (Creswell, 2012), this study employed mixed-methods approach to provide a more complete, holistic and contextual portrayal. Contributing equally, (1) surveys, (2) student interviews, and (3) students’ online discussions were used as data sources after s.a.s.s.y. has ended.

All 22 students participated in the discussions in s.a.s.s.y. Distributed to all students in a face-to-face (F2F) setting, survey data was analysed using SPSS. The semi-structured interviews were also carried out in (F2F) setting with eight students. To gauge more data and validate the findings, students were also contacted via facebook message tool afterwards. Content analysis was carried out on both data from interview and discussion threads (DTs). However, themes from the online discussions were derived using Lee’s (2003) coding and Hew and Cheung’s (2008: 1114) depth thread measure for online discussions.

1.3 FINDINGS AND DISCUSSIONS

1.3.1 Sustaining Community Interaction

Findings from this study indicated that students were interacting with one another in the pattern of inquiry and answer, but the interaction was not sustained. Based on depth thread measure, only one discussion thread (DT3) reached level 6 and this confirms “a discussion is taking place” and that it is “sustained or extended” (Hew and Cheung, 2008: 1114). The other DTs have lower levels (DT1, DT2, DT4, and DT7 = level 5; DT6 = level 4; DT5 = level

3). Analysis of DTs based on Lee's (2003) coding revealed that only 68 posts lead to continuous interaction i.e. the inquiry and answer pattern, with clarification, sharing of knowledge, agreeing and disagreeing embedded in subsequent replies. Table 1 illustrates two types of inquiry and answer pattern.

Table 1(a) Inquiry and answer postings from DT2

Types	Posting
Explicit Interaction (EI)	<u>totally agree with S7.</u> most of the students (S15)
Implicit Interaction (II)	Learning should be made easy for students. If they are comfortable learning in Malay, we should not force them to learn in English. There are a lot of cases where students nowadays are too stressed out. If we force them to learn in language that they do not prefer, they might lost interest in learning the subject (S22)

*EI refers to expression of agreement using language expressions (e.g. 'I agree with Jane' / 'As Jane has mentioned'). II refers to expression of agreement by providing detailed explanation only.

The findings seem to indicate that sustained, extended or continuous interaction were not fully achieved. Findings from surveys and interviews seem to suggest that online interaction depended more on teacher, and not so much on actual discussion requirements. This assumption is derived from the fact that 81% of the students responded positively (agree) to *Teacher communicated important due dates and time frames*, but negatively (disagree) to *I received timely feedback from my peers*.

During interview, it is suggested for teacher to "*participate as actively as everyone else... and provide personal views*" (S2) and because students "*liked being replied*" (S7), "*like to hear from teacher*" (S4) and "*feel ecstatic when teacher responds*" (S6). Perhaps, as suggested by other researchers (Xin, 2012; Jones and Young, 2006), teacher's interaction is key to sustain interaction.

In addition, Conaway, et al. (2005) stated students do not automatically engage in interaction that foster community (e.g. giving supportive feedback, complimenting others, expressing

appreciation). Therefore, it is not surprising that DTs analysis indicated only 4 posts belonging to social interaction i.e providing positive response (e.g. Yes, I get your point, Jane.), self-disclosure and greetings.

1.3.2 Helping Community Learn

Eighty six percent of the total number of students agreed to the survey statement “*Students in this online course helped me learn*”. Analysis of DTs also revealed an overall of 139 posts to be substantial to their learning. Specifically, the students helped one another to reach consensus, initiate group activities, and provide detailed explanations on academic items.

Eighty two posts were related to consensus making i.e students discussed an issue presented and reached a common agreement, as illustrated in the following excerpts in Table 1(b) taken from DT6.

Table 1(b) Consensus making through discussion

Student	Posting
S4	Multicultural materials in curriculum should not only address the multicultural elements on surface but it should also function as a practise for students' to learn the real meaning of being a person who has multicultural value. Just by saying through words will not reach students. In fact they should experience it for themselves. How? By conducting short plays ...
S3	Yes, agree that multicultural curriculum can goes beyond the portrayal of multicultural elements within the curriculum and teaching materials. I found that the element of multicultural is not enough in English textbook and syllabus...So,
S21	Multicultural elements within the curriculum and teaching materials should be re-structure. More and more real life examples and activities can be included in the curriculum to provide an opportunity for students to expose to. Another way which can be done is ...

Thirteen of the posts in the online discussion reflected initiation of group activities via two ways: (1) offering detailed explanation, and (2) providing URL. Illustrated in the Table 1(c), in detailed explanation, the student directed the discussion towards two new topics, i.e. ‘teaching tolerance’ and ‘humour for talking about culturally sensitive issue’.

Table 1(c) Initiating group activities by offering detailed explanation

Student	Posting
S5	everyone has his/her accent. Now, we have got to deal with the fact that "no man's speech is inferior, only different". "Our problem is how to teach tolerance of difference and acceptance of a man for what he is, not for how he talks". Thus as future language teacher, we have to educate our future students to appreciate not only our own language but also other languages. No language is superior to the other because language is a system and every system has its own strengths and uniqueness.... language of humour is very effective to be used to talked about culturally sensitive issue because it seems to be a bit polite in a way that people would not be easily intimidated.

Forty four postings also contain detailed explanation on academic items, with an example shown in Table 1(d).

Table 1(d) Detailed explanation on academic items

Student	Posting
S19	I think in macrosociolinguistics context , social inequality can be explained by how level of formality and social class affects the verbal and nonverbal communication of the participant. Labov's research in the Lower East Side of New York City showed that individual speech patterns were part of a highly systematic structure of social and stylistic stratification. He studied how often the final or preconsonantal (r) was sounded in words like guard, bare and beer. Use of this variable has considerable prestige in New York City. It can be measured very precisely, and its high frequency in speech makes it possible to collect data quickly.

Thus, social inequality affects the choice of particular linguistic form in language. I think social inequality also can be best explained through multilingualism.

In line with the focus of this paper, students were also interviewed about teacher practices that encourage students to help each other in their learning. For this, students pointed out teacher's emphasis on working together in different group sizes helped them "*learn many things*" (S2) and understand concepts/topics/questions from the explanations given by their peers (S1, S4 and S6), "*get some ideas from what they have written, their responses help in my thinking and help in making connection to what we have learnt*" (S4), "*prepare for the final examinations*" (S8), "*correcting my views*" (S7), and "*focus on topics that are important and relevant.*" (S6).

Survey data resulted the following findings: '*Teacher has provided a platform for discussion*' (86%), '*Teacher provided useful information from a variety of sources.*' (90%). Although students liked the "*thinking outside the box*" approach (S6), "*independent learning and collaborative learning concepts*" (S4), interviews also suggested increased "*feedbacks and facilitation in the online discussion*" (S5) to help students in "*understanding concepts*" and "*being corrected*" (S4, S7). Students' expectations for greater attention on teacher's intellectual and scholarly guidance as subject matter expert are also reflected in the survey: '*Teacher was directly involved in guiding students towards understanding topics*' (57%), '*Teacher helped me revise my thinking*' (62%), '*Teacher provided explanatory feedback*' (67%).

Absalom and Léger (2011: 206) established that although peer scaffolding among students are encouraged, students still view teacher as "privileged channel providing feedback, monitoring progress and assessing input" and that teacher's comments are "indicator of satisfactory completion of task". Researchers suggest comprehensive formative feedback to students, as a whole group and as individuals (Nagel and Kotzé, 2010) and comprehensive

corrective postings (Bedi, 2008).

1.3.3 Preparing Learning Environment

Findings indicated that students' perceptions of online learning environment are generally encouraging. Majority of the students responded positively to the following survey statements '*Teacher has helped set climate for learning*' (81%). In the interview, S8 pointed out that "*the design of the course made it looked casual and friendlier not so formal...s.a.s.s.y sounds cool!*". Three other students also mentioned the logo and s.a.s.s.y and stated that "*It's suitable for young students*" (S1), "*it's unique!*" (S4), "*represents us*" and "*it is refreshing!*" (S6). Three students (S4, S5, S6) also pointed out having a modicum of anticipation of the comic strips uploaded online. S5 responded, it "*created some sort of less formal environment... every time I log in I wish there's a new one.*"

In addition, the students (S2, S7, S8) also mentioned the lecturer's picture on the main page. A student revealed getting "*some form of adrenalin rush*" (S8). Having lecturer's photo online seems to create a sense of feeling that lecturer is monitoring (S7, S8) "*what is going on*" (S2). S6 pointed out that lecturer's photo was a constant reminder to "*participate and participate*". Meanwhile, S2 remarked it "*is telling 'you better do well in the discussion'*" and added that "*I try to post something good*". Similarly, S8 stated extra effort to search for online information was given "*to refine*" postings.

Finally, the students also commented on the layout of the course. In s.a.s.s.y., the first page was used as the main page systematically housing the netiquette, learning tasks, learning materials and deadlines. Expressing satisfaction, S4 stated that the lecturer took into account the students' need and this consideration is "*about 85%*" of the lecturer's attention. When prompted about the specifics of the learning environment, the students responded "*Everything is just there*" (S6), "*Everything can be seen in one page*" (S7), "*easy to see and search for things*" (S2). Since all was

housed in one page, students also remarked “*won’t miss anything*” (S7), downloading handouts and submitting term papers easier (S2), deadlines were clearly seen (S5 and S6), and the online discussions were available on the main page (S7 and S8).

Three students (S2, S6, S7) described the first page as “*well-organised*”. S7 also used the expression “*interactive, eye catching*”; S8 elaborated on similar qualities by pointing out that “*important announcements are signalled with a blinking thumb*” and important piece of information were “*written with red coloured ink*”

Collison, et al. (2000: 1) point out that “course design and presentation mechanisms” coupled with “excellence in online dialogue facilitation” as important aspects that need to be mastered by online teachers. In her review, Swan (2004) also lists interface design as one of the factors influencing students’ interaction. Northcote (2010) and Reupert, et al. (2009) also encourage teachers to express their personality in the online course as it can increase “warmth” and decrease the “dehumanisation” of learning. Teacher’s selection of images, captions, and colours coupled with placement of social activities, for example, can reflect teacher’s character, values and predisposition. The fluidic nature of the online environment allows teacher to design the OLE and to make changes *in situ*. Teacher is required to possess technical knowledge and to invest time to manipulate the environment that the students are going to be immersed in (Deris, et al., 2012a; Swan, 2004).

1.4 CONCLUSION

This study started off with an aim to investigate the development of online community with a focus on teacher practices. This study supported the findings on the potentials of community in helping students in their learning. However, this study has also demonstrated that having shared activities does not necessarily lead to sustained interaction. From the findings and discussion, it can

also be concluded that OLE can be designed to support community development.

With the notion that ‘teacher practices’ refers to planned and spontaneous, direct and indirect teacher’s actions in the instructional design, direction and facilitation, this study has shown several practices that support the development of community. First of all, to ensure interaction is sustained, teacher practices must also actively posting messages in the interaction. Spending too much time posting messages that are not pertinent to learning, however, is ill-advised and counter-productive. This study recommends teachers to become part of the community and to model the ways to sustain interaction by participating in the discussions. Since this research lacked data concerning the postings from teacher, an investigation of how teacher’s postings can sustain interaction is recommended.

Secondly, providing comprehensive corrective postings and confirmation of learning are teacher practices that are integral in ensuring students confidence in the subject matter leadership of their teacher and their overall learning experience. Adopting the role of ‘sage on the stage’, teachers risk moulding students to become mere ‘voyeurs’ and not academic ‘connoisseurs’. Nevertheless, becoming a ‘guide on the side’ completely could put teachers’ expertise to waste. Recognising neither side provides ideal condition for learning in tertiary level, there must be a balance. As much as we want our students to grow on their own, some form of recognition or assurance of students’ achievement is still much needed by our students. In net-based professional communities, at the receiving end, we often find managers or consumers who, in a sense, provide confirmation that their outcomes or innovations are of consequence. In the context of online learning where there are no actual managers or consumers, teachers must then provide subject-matter leadership by adopting both the roles of guide/facilitator as well as assessor.

Finally, teacher practices must include deliberate planning and designing of learning environment. The interface of an online

course usually houses the most basic elements, not different to a physical classroom with the usual furniture. Online teachers, however, are empowered with technology to make changes to their classroom. Compounded with the resources on the internet, we can choose whatever ‘furniture’ with functions, colours and design of our choice and present them in whichever arrangements that we choose them to be. While there is no specific guide on how learning environment should look like, teachers are reminded that the design will influence the climate of learning and can encourage the development of a community.

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ONLINE SOCIAL NETWORK TO ENGAGE STUDENTS' MEANING MAKING IN SHAKESPEAREAN DRAMA

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ABSTRACT

Technology has become an integral part of everyone's life. Students nowadays are adept at using technology especially online social network such as Facebook, Twitter, MySpace and so on in their everyday life. This has helped them to connect and communicate with friends and relatives easily. It also helps them to develop and connect meaning from their inner world to the outside world. It is important for teachers to take this opportunity to integrate online social network in the teaching and learning processes as it may encourage engagement and enjoyment among students. In the case of introducing Shakespearean drama in literature lessons, technology in the form of social media can become an effective platform for students to become active meaning makers. Through a case study of twenty teacher trainees, this paper uncovers how Shakespearean drama can be taught and learnt through online social network in particular Facebook. The findings generally show that when students got to express their thoughts and feelings through Facebook they were able to develop their linguistic, cultural and personal competence as they connect and communicate personal meaning openly which in turn encouraged participation in classroom learning.

Keywords: online social network, Shakespeare, drama, engagement

INTRODUCTION

Today, our students grow up in a borderless world that is heavily depended on technology which allows them to connect, experience and socialise. They depend much on laptops, MP3s, I-Pads, smart phones, and social networking sites to support their interactions with others and with the world around them. They are technology savvy and they spend a lot of time with these technology tools which they enjoy doing. Their desire for immediacy is palpable: they multitask or Google a subject rather than wait for an explanation from the teacher (Diana, 2005). Therefore, technology has had a striking impact on the students and their learning process.

Since technology has become widely used in education and research has revealed numerous interesting findings about its usage in language learning (Pramala, 2006), teachers should use technology in the teaching and learning processes. In the case of teaching literature, teachers can use technology to engage students in co-operative learning in order to develop students' interest in literary work (Norlida, Nuradyani and Puteri Rohani, 2004). Technology can also encourage the exchange of ideas and students' participation (Vethamani, 2006).

LITERATURE REVIEW

In the Malaysian context, there have been numerous studies on teachers' approaches and students' perceptions on the teaching and learning of literature (Kaur, 2003; Siti Norliana, 2003; Kumar, 2003; Hwang and Mohamed Amin, 2007; Tina, et.al., 2007; Marzilah and Sharifah Nadia, 2010). Research has revealed that teachers prefer teacher-centred activities in the literature classroom which cause students to be passive and unable to respond critically (Kaur, 2003; Siti Norliana, 2003; Kumar, 2003). The findings by Hwang and Mohamed Amin (2007) showed that the teachers often act as a dominant figure who read, retell and explain the story, ask

questions and give answers based on literature component. Teachers often focus on information gathered about the text to enable students to discover the 'correct answer' rather than their own perception or personal response to the text (Tina and Zaidah Zainal, 2008). Teachers also only focus on the language part of the literature i.e. grammar and vocabulary while neglecting other essential aspects of it like the appreciation of the literary works (Marzilah and Sharifah Nadia, 2010).

Moreover, students on their part prefer language-based approach that help them in understanding the lesson as they have limited access to the language and it is hard for them to express their opinion (Zubaidah and Shaidatul, 2010). They also do not fully understand what they have learned and they do not know how to appreciate literature (Marzilah and Sharifah Nadia, 2010) while the linguistic and cultural barriers that exist between their knowledge and the texts prevent them from studying literature (Zubaidah and Shaidatul, 2010).

Drama in Shakespeare's language can be difficult, even baffling (Frank, 2000). This is obviously so for students coming in four hundred years after Shakespeare's time, so the language itself is unfamiliar (Frank, 2000). This has posed problems to the students when they study Shakespearean drama. Furthermore, Shakespeare's complex sentence structures and use of now obsolete words lead many students to think they are reading Old or Middle English (Amanda, 2000). When they read the language that they think is in Old English and full of 'hidden' meanings that they have to interpret themselves, they find it difficult to understand the text.

Another problem in studying Shakespearean drama is its unfamiliar culture. In a study by Mukundan (1993), he concluded that many students had "problems dealing with foreign cultural elements in the (literary) text." This means that students who read texts with too many unfamiliar, foreign elements may encounter difficulties in understanding the texts. When they read Shakespeare's drama which is written in Elizabethan time, they may find it difficult to understand and connect to the cultural elements in

that time. In order to assist students in the teaching and learning processes, a specific pedagogical strategy would need to be used in order to help them with Shakespearean drama. So Facebook is a good platform to help to promote active learning among students in understanding Shakespearean drama.

English literature can introduce students to a range of aspects, not only of the English language but also of English culture. Carter and Long (1991) proposed the use of literature in ESL and EFL contexts to achieve three main learning objectives, namely, (1) language model, (2) cultural model and (3) personal growth model.

When studying Literature, students can learn not only language aspects such as vocabulary items but also but it improves students' main language skills, especially reading and writing (Collie and Slater, 1987). This language that they have learnt can be used for specific and aesthetic purposes. Familiarity with the concepts of beat, metre and rhythm can improve their own writing as students are able to appreciate and apply these ideas.

Moreover, studying literature does not confine the students to the traditions of England but includes the possibility of introducing them to traditions which inform English literature, such as the study of ancient Greek drama, and also literature in other contexts, such as American literature and local literature. In Malaysia, literature in English includes various literary texts from various genres (novels, dramas, short stories and poems) and it is taken from local (Negeri Sembilan dan Kedah) and foreign texts (England, Jamaica, Jakarta). By studying this local literature as well as foreign literature, it enables students to understand and appreciate cultures and ideologies different from their own in time and space, and to come to perceive traditions of thought, feeling and artistic form within the heritage the literature the literature of such cultures endows (Carter and Long, 1991). Literature is an excellent vehicle for communicating ideas across cultures. Writers from around the world speak from their own experiences and write about what is related to their own land. By reading the literature from other

countries or different areas of our own country, students can learn so much about how others view life.

Finally, literature can be beneficial for the students' personal growth. An enjoyment and appreciation of literature will give students the ability to develop this into an interest in books and reading as they move away from their studies and into their adult lives. They will have the confidence to approach and tackle new forms of books and writing, since they were exposed to a range of literature during their school days. It also provides the students with an alternative to the pervasiveness of "television culture" and technology gadgets such as handphones and MP3.

Drama engages students to use natural, conversational English in a meaningful context (Vani Chauhan, 2004). It gives a context for listening and meaningful language production, forcing the students to use their language resources and, thus, enhancing their linguistic abilities. Students are able to connect the meaning in literary texts and improve their language skills through it. Since literature is made from language, if students are exposed to works of drama they will develop their 'literary competence' (Carter and Long 1991) especially when they use drama techniques. They can learn and improve not only the language aspects such as vocabulary items but also the main language skills (Collie and Slater, 1987) especially listening and speaking when drama provides situations for practising these two language skills. They can use these skills in a more meaningful and real context and the language of the outside world can be brought into the language classroom when the students express their thoughts and emotions (Vethamani, 2004). In a research done by Ru-Chu Shih (2011) on a group of 23 first-year college students at a technological university in Taiwan, the findings showed that students improve their English writing skills and knowledge not only from the in-class instruction but also from co-operative learning through Facebook integrated instruction. In addition, this significantly enhances students' interest and motivation.

Drama also allows students to communicate with and

understand others in new ways. As literature preserves cultural and artistic heritage, it allows students to understand and appreciate cultures and ideologies different from their own in time and space (Carter and Long, 1991). In the Malaysian secondary schools, there were only two dramas in English literature component: Rumpelstiltskin in Form Two (a fairy tale taken from Germany) and Gulp and Gasp in Form Four (a melodrama taken place in British). By studying these foreign texts, students get to understand and appreciate how others view life. They become better able to put themselves into others' shoes and relate to them.

This understanding can be beneficial for the students' personal growth (Carter and Long, 1991). Rosli (1995) asserts that studying literature, for example, drama, motivates and encourages students to make a connection between the themes of a text and his or her personal life and experiences. Hirvela (1996) also explains that responses are personal as they are concerned with students' feelings and opinions about the literary text. An enjoyment and appreciation of drama will be developed as students are able to connect and communicate meaning in literary texts.

Drama often activates in students information which they have understood implicitly and allows them to verbalise what they have discovered (Vethamani, 2004). Therefore, drama can be used to promote active learning - to give students a kinesthetic and emphatic understanding as well as an intellectual understanding of a topic. The classroom experiences can provide students with a shared learning experience on a topic. Through active learning like drama, students can share responsibility to participate and collaborate, take advantage of each participant's strengths, and rely on each other for good project management and effective learning.

Drama also provides students the opportunity to explore and interact with the text and to portray their perceptions in a new and imaginative way (Vethamani, 2004). When they involve in preparing and designing costumes and props for their drama performance, they become creative while developing a deeper understanding in drama.

In view of the benefits of using drama in the teaching and learning processes, it is proposed in this paper to integrate the use of technology to help students to study Shakespearean drama. The use of technology tool such as online social network allows teachers to revolutionize the way they connect with others and the way teachers improve their way in teaching students. It allows teachers to connect one-to-one and one-to-many (Michelle, 2010). This is very useful for a classroom with many students as teachers may not have the time to communicate with all students.

Technology not only provides the students with development in linguistic and socio-cultural expertise, but also ICT-related skills through the target language. According to Kaspar (2000: 106), students “must acquire linguistic competence in a new language and at the same time develop the cognitive and socio-cultural skills necessary to gain access into the social, academic, and workforce environment of the 21st century.”

Technology tool such as online social networks are very popular among the students. Walsh (2011) discussed the seven reasons to leverage social networking tools in the classroom: (1) engagement, (2) social learning, (3) use time outside of class better, so teachers can use class time better, (4) provides opportunities for writing and writing assessment, (5) encourage dialogue, reach more students, (6) help students to get ahead of the professional curve and (7) build connections. This tool is useful for a classroom with forty or fifty students when the teachers are not able to give individual attention to each of them.

This paper proposed the use of online social network in particular the Facebook to teach Shakespearean drama. It is the most popular network tool among the students. It is more open and connected with more than 500 million active users all over the world (Facebook, 2011). Many people use it to communicate, interact and socialise with each other. It helps people to manage a range of interpersonal interactions with others, for example, by means of text, image, video, ‘wall’ spaces, status updates, news feeds, photosharing, tagging and so on (Lankshear and Knobel,

2011). It is an effective tool for teachers to employ as students are using it frequently and it can help students to understand Shakespearean drama easily.

The conceptual framework in Figure 1.1 of the present study was developed by the researchers to establish the relationship between the meaning of connection, communication and creation with the tool of social online network to engage meaning making.

METHODOLOGY

Research Design

Based on qualitative methodology through a case study, content analysis was used to examine the students' responses when using Facebook. The advantage of content analysis is that it is unobtrusive (Jack and Norman, 2011). A researcher can "observe" without being observed, since the contents being analysed are not influenced by the researcher's presence. In this study, the content analysis were based on the students' responses in the Facebook under three main themes: connection, communication and creation of meaning in the drama class.

Rosenblatt (2005) stresses the importance of the reader's role in interpreting literary texts. Rather than relying on a teacher to give them a single, standard interpretation of a text, he holds that the individual students learn to construct their own meaning by connecting the text to issues in their lives and describing what they experience as they read. The responses of fellow students also play a pivotal role. Through interaction with their peers, students move beyond their initial individual reaction to take into account a multiplicity of ideas and interpretations, thus broadening their perspective. By using Facebook, it provides the students the opportunity to help one another to learn and understand when they gave responses, comments and feedback through their posts. Therefore, students become active learners.

Research Instrument and Participants

Besides the content analysis based on students' responses on Facebook, a survey questionnaire was distributed to all students at the end of the course. The results of the survey questionnaire were analysed in three categories: connecting meaning (items 1 to 4), communicating meaning (items 5-8) and creating meaning (items 9 to 12) in Shakespearean drama through the activities done in the classroom.

The participants were a group of twenty students who took the course "Drama in English" (TSL1064) in the second semester in the foundation course at an Institute of Teacher Education Campus in Johor, Malaysia. In this course, they had to read one Shakespearean drama in detail.

RESULTS AND DISCUSSION

The findings were discussed based on the content analysis with the three main themes: connection, communication and creation of meaning in the drama class. Activities discussed in this study were watching the movie, attending drama workshop, role-playing Shakespeare's other plays and drama performance.

One of the activities students enjoyed was watching the movie "Hamlet" by the actor Mel Gibson and the actress Glenn Close. After the lecturer posted the question on their views of the movie, two students commented that the movie was difficult for them to understand. But other two students commented that the actor's expression was great and extreme. Then, one student commented that maybe Shakespeare's play was meant for a stage play and poor for a movie. Here, we could see that the students connect and communicate their meaning of Shakespearean drama through Facebook. Later, we would see how this movie give them ideas on creating meaning in their drama performance.

As for the drama workshop, the students gave long comments

on what they had learnt from the workshop. The comment quoted in the study was originally from students without any changes to spelling and grammar. One of the comments given was,

“This workshop raised my awareness on the skills or techniques in acting out a drama. i knew that the skills and techniques exists, but i never knew how to apply them. the workshop was very practical as we could apply what we have learned immediately (through the performance). i think this is one of the most beneficial and useful workshops i've been to in a very long time.”

Other students also communicated their ideas about the workshop. This drama workshop has really helped students to connect and create meaning in the literary texts to their drama performance at the final stage.

Instead of waiting for the lecturer to post question, the students had also posted their own questions through the Facebook. One student posted his question regarding the play that the different group had chosen for the role play. The other groups responded and gave their answers. Again, the use of Facebook is an effective tool for students to exchange information in their communication.

In this activity, the students had to choose a character from Shakespeare's other plays to role play. They need to design costumes and props for a selected scene of the play. The students had shown their creativity in that they sewed the costumes themselves. There were two boys who played their roles as girls and they borrowed their blouses, skirts, scarves and wigs from the girls. They also did their own props when they made their own crowns and drew trees on polisterene. This had proved that the students were able to connect and create meaning in Shakespearean drama from the activities done in the classroom.

It seemed that the students enjoyed this activity very much. This could be seen in their comments to one of the lecturer's posts after their drama performance. The comments given were “Enjoyed!”, “Drama class is the best class” and “yep!!! I enjoyed it too!!!” This post received 21 “like”.

In a post by a student named Anderson, he posted the group photo after one of the drama classes and gave a comment “Drama in English class, Filled with fun!” This post received 56 “like”. Also, at the end of the drama performance, a rap was done by the students for the play, a comment given was “OMG, so funny!” This showed that the students really enjoyed the activity done in the drama classroom.

The results had shown the students’ attitude were highly positive as their comments of “enjoyed” and “fun” were found in their responses and posts. This motivates and encourages them to read literature especially Shakespeare’s drama.

The 12 items in the questionnaire had mean scores ranging from 4.45 to 4.80 on a 5-point Likert scae (5=strongly agree; 4=agree; 3=not sure; 2=disagree; 1=strongly disagree) with standard deviation ranging from 0.03 to 0.33, indicating the students agreed or highly agreed with the statements on the survey questionnaire (Table 1). Additionally, the statistical results of a one-sample t-test show that all 12 items on the questionnaire had mean scores significantly higher than 4, indicating the students’ attitudes and perspectives towards the use of Facebook in a drama classroom were in highly consensus.

The statistics shown in Table 1 indicated that the students agreed that the drama class and the use of Facebook engage them to connect, communicate and create meaning in the learning experience.

No	Statement	Mean	SD
1	I improve my language skills such as listening, speaking, reading and writing after this course.	4.50	0.14
2	I improve my understanding of the others’ culture after this course.	4.50	0.07
3	I experience personal growth after this course.	4.55	0.07
4	I am able to understand the meaning of the elements (setting, character, theme, etc.) found in a drama after the course.	4.65	0.06

5	I enjoy sharing information with the lecturer and friends through learning on Facebook.	4.55	0.33
6	I enjoy communicating with the lecturer and friends through learning on Facebook.	4.70	0.33
7	My interaction with the lecturer and friends is enhanced through learning on Facebook.	4.80	0.03
8	I am able to complete my coursework through learning on Facebook.	4.70	0.05
9	I am able to design costume and props for the drama performance after this course.	4.65	0.12
10	I am able to act confidently in a drama performance after this course.	4.70	0.22
11	I am more creative (for example, create a rap) for a drama performance after this course.	4.45	0.13
12	I am more confident to organise a drama performance in the future after this course.	4.80	0.03

The findings had shown that the use of Facebook is beneficial as it enhances learning not only in the classroom but also outside the classroom. When students got to express their thoughts and feelings through Facebook they were able to connect and communicate personal meaning openly which in turn encouraged participation in classroom learning. This promotes active learning (Edgar Dale, 1946). Active learning is a process whereby students engage in activities, such as reading, writing, discussion, or problem solving that promote analysis, synthesis, and evaluation of class content. Therefore, teachers can utilise Facebook to engage students in active learning in addition to PowerPoint lectures, multimedia and movies.

Through the activities done in the classroom, the students were able to connect the meaning of the drama to enhance their language skills, understanding the others' culture and experience personal growth after the drama course. They were also able to understand the meaning of the elements (setting, character, theme, etc.) found in a drama.

The drama class also helped the students to create meaning from Shakespearean drama through their performance in the final

project for the coursework. They were able to design costume and props and act confidently in a drama performance. They were also more creative, for example, they could create a rap at the end of the drama performance. Therefore, the course had given them more confidence to act in a drama in the future.

CONCLUSION

Based on the evidences disclosed in this study, the lecturer and students can interact with one another easily through Facebook. It saves time and space as the lecturer and students do not need to meet face-to-face in a classroom to give all the instructions, input and guidance. Therefore, it is important for teachers to employ this technology tool which provides the diverse of modes of communication in the language learning process so that the students are able to participate in this global world.

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TECHNOLOGY APPLICATIONS IN CHAM LANGUAGE CONSERVATION

Van Ngoc Sang & Mohamad Bin Bilal Ali

ABSTRACT

All the ethnic language is established and developed for a long time in the historical process. Cham language is the indigenous language in Vietnam but now it becomes the minority language. However, the Cham script was appeared in 4th century on stone stele in Tra Kieu. It was considered as the first language in South East Asia. Due to many reasons and influenced by history, Cham population are now just over 145 thousand people, therefore the Cham language is facing endangered and they are at risk of deformation for various reasons. This paper aims to introduce some specific results of information technology in Cham language heritage conservation in Vietnam such as creating Cham fonts, and Cham font conversion. In this experiment, for Cham font, the acceptable level of Cham Thrah font is 60% of usability and 65% of high accuracy. On the other hand, the acceptable level for champa font only is (12%, 8%), camtanran is (5%, 14%) and bingu tanran (23%, 13%). For Cham font conversion application, we have checked the accuracy percentage of four Cham poems and results Ariya Gleng Anak 99,88% (n=2459); Nai Mai Mang Makah 100% (n=2523); Ariya Cam Bini 100% (n=1823); Ariya Po Ceng 99,91% (n=2202). Cham font and Cham font conversion are necessities and meaningful in conservation of Cham script. Using technologies to preserve the Cham language heritage is not only theoretically significant but also has practical significance conservation of heritage languages of ethnic groups in the development process.

Keywords: cham language; cham script; cham font; cham conversion; cham font conversion.

INTRODUCTION AND BACKGROUND

Cham people are ethnic group of the Champa kingdom was established in the second century in central Vietnam. Cham language is one of the languages in the family of multi-island "Austronesian". Therefore Cham language is closely related with Malay language (Dharma, 2006). As compared to the Malay language, researchers have found traces on stone stele in Java island in the 7th century (Casparis, 1956), while Cham letters has also appeared on the first stone stele, namely of Dong Yen Chau (Tra Kieu) in the 4th century (Coedes, 1939; Lafont, 2011).

Using information technology (IT) to preserve the endangered language is significant in the current, when the digital technology has developed with the diverse features of the storage and dissemination of information. IT has contributed in the indigenous language education, restoring and preserving of ancient script system is a very obvious fact in many countries (Grenoble & Whaley, 2006).

Using font to type Cham script on the computer has become essential issues to help compiling textbooks, data storage, teaching and learning Cham script. Cham-Tanran font was created by the EFEO for Macintosh keyboard in 1988 showed that this font has typography and typeface relatively standard. However, this font is still having some defective and technical errors. *Cam Thrah.ttf* font created by Sang (2002, 2012) and *Bingu di tanran.ttf* by Cham Unesco (2012) developed from Cham-Tanran (EFEO) rebuilt for Windows keyboard. However these Cham fonts inconsistent the value of the code page, this causes many difficulties in the exchange of information. Besides, these fonts are still limited in the technical thereby create documents not ensure scientific and aesthetic.

Based on the above research on conflict and dangers of the

Cham language, as well as the use inconsistent of Cham font typing and storing, we are interested in this issue and the three research questions of this study are as follows:

- (i) What is the choice of Cham script among Cham people?
- (ii) How to develop application technology for Cham's script preservation (such as Cham fonts, and convert Cham font)?
- (iii) What is the acceptable level of the Cham font conversion application?

RESEARCH METHODOLOGY

Research methodology play an important role in the process of implementing the project, it provides information and steps to carry out the program. In section 1, a brief of historical research on Cham script and Cham fonts are presented and used over time to preserve and conserve the Cham Akhar Thrah.

Population and Sample

The target population of this study included two groups of people 1) university students, working people; and 2) religious people. An estimated of Cham University students in Binh Thuan Province total about 120 students, and number of Cham working people in Binh Thuan are 195. The scope of the survey for religious group only performed in three villages that are *Palei Canat*, *Palei Dik* and *Palei Aia Mamih*. The numbers of religious people in three villages were 105 people. Hence, the total of population in 2 groups is 420. Meanwhile the totals of items used for Cham script survey are two items: Choosing traditional Cham scrip; and Choosing modified Cham scrip.

According to (Krejcie & Morgan, 1970), the ever increasing demand for research has created a need for an efficient method of determining the sample size needed to be presentative of a given

population. In order to know the number of sample size to be studied in a total 420 people of population in two groups. To obtain the required sample size using the formula at population is 420, the sample size representative of two groups is 200. The details are shown in Table 1.

Table 1 Proportionate sample techniques of group study

Group of study	Population	Proportionate sample	(%)
University students	315	150	75%
Religious people	105	50	25%
Total	420	200	100

Based on the Table 1 the required sample size for this study has been stated at 200. Out of 200, 75% (150) were come from group1 while 25% (50) were comes from group 2.

Cham Font Design

In order to design new *Cham* fonts, we based on a number of valuable documents and dictionary which are using today include Cham-French dictionary of E. Aymonier & A. Cabaton; Cham-Vietnamese-French dictionary of G. Moussay, and *Akhar Thrah Cham* materials used in Cambodia that is currently stored in the library in French.

Akhar Thrah Script is a script derived from the Sanskrit, difference Latin characters. To design the font for *Akhar Thrah*, the first step is analysing the number of characters needed to create the font for *Akhar Thrah* script. The total numbers of *Akhar Thrah* characters required design are 86 characters. After analyzing and removing some of the same characters as (H), (3), (o), (r), respectively (H) 1, (i) 3, (o) 5, (6) 6. Thus, the total number of characters needed to be designed for *Akhar Thrah* fonts are 82 characters. However, for the convenience of typing Cham script, we design and add seven new punctuation and one characters for

using in Latin system, which is ᵹᵹ, ᵹᵹ, ᵹᵹ, ᵹᵹ, ᵹᵹ, ᵹᵹ, ᵹᵹ). Then, the total numbers of Cham script character need to design are 90 characters as show in Figure 1.

0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
	ᵹᵹ	"	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	'	ᵹᵹ	'	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ
0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ
0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	(	ᵹᵹ	ᵹᵹ	,	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ
0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
ᵹᵹ	ᵹᵹ	(	ᵹᵹ	ᵹᵹ	-	ᵹᵹ	,	)	'	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ
0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ
0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ	ᵹᵹ

Figure 1. Code point location of Cham Thrah font

Cham Font Conversion Method

In order to convert EFEO Cham Latin to Cham Akhar Thrah, our approach is to divide the process into two phases. First to convert from EFEO Cham Latin into intermediate characters code and each intermediate character code is corresponding only with a character of Cham Akhar Thrah. In this phase, the process is also selecting the word from Special words list and Special meaning list. This solution can support conversion of many different types of Cham Latin into various Cham fonts.

Meanwhile the second phase is converting the intermediate character code corresponding to the Cham Akhar Thrah as shown in the Figure 2.

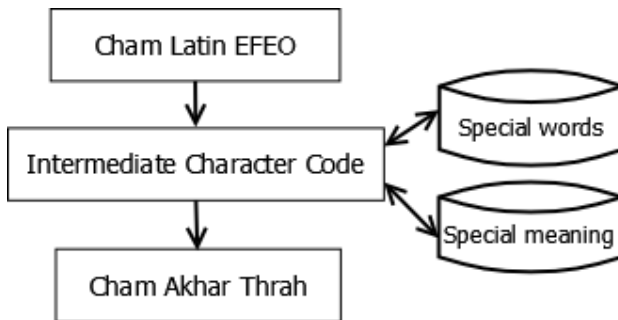


Figure 2. Diagram of converting EFEO Cham Latin to Cham Akhar Thrah script

EXPERIMENTS

Exploring the Preferable Cham Script

To explore the preferable Cham script for preservation, a survey to choose which kind of Cham script to use for Cham community. With 200 samples for 2 groups: 1) Religious group and 2) University students and working group (Sang, Ali, & Said, 2013). The results show in Figure 3.

The chart shows that the number of respondents in all two groups supports using the traditional Cham script is 97,50% whereas only 2,50% supports for using the Modified Cham script. Surprisingly, there is 100% of the Religious group supported the traditional Cham script. During survey, they requested that the Cham people should use the traditional Cham script.

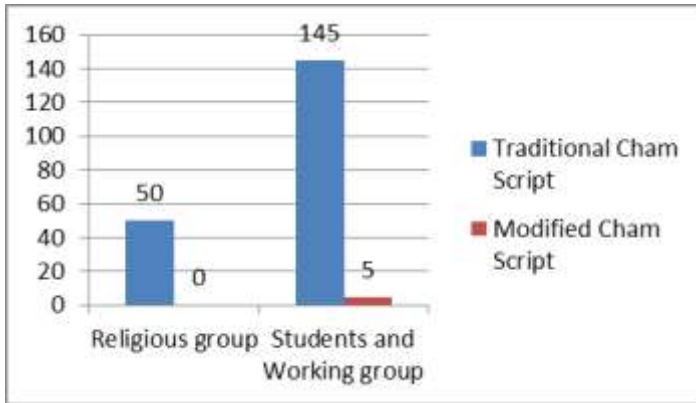


Figure 3. Chart of choosing Cham script to use

Creating Cham Font

Fontographer was used to create favorable conditions for design Cham font with a number of important functions such as viewing all the character designs in the window, test or modify the font encoding and kerning in Metrics Window,...and supported on many different operating systems such as Macintosh, Linus, or Windows. This font has been built based on Cham dictionary and design on Unicode. *Cham Thrah* font typeface is based on drawings presented in Cham - Vietnamese - French dictionary of G. Moussay, published in 1971. The result is shown in Figure 1.

Converting Cham Font Evaluation

In this experiment the program has been tested with four Cham Poems from EFEO Cham Latin to Cham Akhar Thrah (the traditional Cham script), and Cham script has compared by Cham - French dictionary of E. Aymonier & A. Cabaton; Cham - Vietnamese - French dictionary of G. Moussay and the results is presented in Table 2.

Table 2. Result of Cham font conversion application

Number of documents (Cham Poem)	Number of words	Checks (%)	Error (%)
Ariya Gleng anak	2459	99,88	0,12
Nai mai mang Makah	2523	99,92	0,08
Ariya Cam Bini	1823	100	0
Ariya Po Ceng	2202	99,91	0,09

The following interface is the result of research products and tested the conversion of two first sentence of the poem Nai mai mang Makah as presented in Figure 4.

**Figure 4.** EFEO Cham Latin to Cham Akhar Thrah interface conversion

RESULTS

In the aspect of Cham script conservation, the results are presented in Figure 3. The chart shows that the number of respondents in all two groups supports using the Traditional Cham script is 97,50% whereas only 2,50% supports for using the Modified Cham script. Besides, there is 100% concern the Religious group supported the Traditional Cham script.

Cham Thrah fonts has significant in using, typing document, research, communication and teaching Cham language. Compared with *camtanran.ttf*, *champa.ttf*, *bingudi tanran.ttf*, it is so that *cham Thrah* fonts have outperformed with high accuracy and easy to use. Moreover, on both Windows and Macintosh keyboard, the *cham thrah* font has the same codepoint value, and then it is very convenient for users. In survey 50 users, result shows that *cham thrah* font has surpassed in accuracy and ease of use as shown in Figure 5. Specifically, the acceptable level is 60% of usability and 65% of high accuracy. On the other hand, the acceptable level for *champa* font only is (12%, 8%), *camtanran* is (5%, 14%) and *bingu tanran* (23%, 13%).

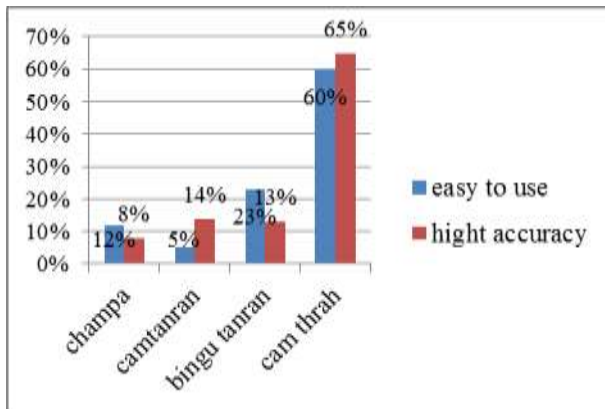


Figure 5. Chart of survey and assessment Cham font

Cham font conversion applications with the interface are shown in the Figure 4. The accuracy percentage of four Cham Poems is presented in Table 2. Poem Ariya Gleng anak (99,88%); Nai mai mang Makah (99,92%); Ariya Cam Bini (100%); Ariya Po Ceng (99,91%). Cham font conversion application will be used in schools, institutions as well as in assisting teaching and learning Cham language.

CONCLUSIONS

This study has been conducted to identify the choice of Cham script among Cham people about traditional Cham script and modified Cham script, and also carry out a new approach in analysing and designing all code point value of Cham fonts reasonable on the keyboard. Cham fonts have been design based on Unicode and using for both Macintosh and Windows keyboard. Hence, Cham Thrah character and Times New Roman characters have the same size in the same text. Therefore the conversion or storage information on both operating systems is stable results. In addition, the applications of Cham font conversion from EFEO Cham Latin to Cham Akhar Thrah from the experiments were highly accurate. Information technology applications to create Cham font and converting Cham font have an important implication in Cham language conservation.

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KEFAHAMAN TERHADAP TAJUK GEOMETRI DALAM KALANGAN PELAJAR SEKOLAH RENDAH DI BANDAR PADANG

Syafri Ahmad, Noor Azlan Ahmad Zanzali, & Abdul Halim Abdullah

ABSTRAK

Aktiviti penyelesaian masalah dalam geometri merupakan aktiviti yang baik untuk perkembangan berfikir pelajar (student thinking), kerana berhubungkait dengan ruang, pemikiran, serta terhubungkait dengan dunia sebenar pelajar. Tujuan kajian ini adalah untuk mengenal pasti secara deskriptif kemampuan berfikir geometri pelajar sekolah rendah pada bilik darjah IV di Bandar Padang, Sumatera Barat Kerajaan Indonesia. Jenis kajian ini adalah kajian deskriptif. Seramai 390 sekolah rendah sebagai populasi, dan sebagai sampel dipilih secara rawak sebanyak tiga sekolah rendah di Bandar Padang dengan tiga peringkat kualiti sekolah, iaitu peringkat atas, peringkat tengah dan peringkat bawah. Pada kajian ini dikemukakan secara am bagaimana kemampuan kefahaman geometri pelajar kelas IV Sekolah rendah di Bandar Padang. Dengan memperhatikan hasil ujian (peperiksaan), didapati bahawa purata yang diperolehi pelajar kurang dari kriteria ketuntasan minimum (KKM). Didapati dalam kajian ini bahawa purata pencapaian di sekolah rendah Awam Percobaan Padang 47,2 (rendah) sedangkan KKM 75, Sekolah rendah Awam 14 Padang dengan purata 50,9 (rendah) sedangkan KKM 65, dan Sekolah rendah Awam 16 Pisang dengan purata 27,1(sangat rendah) sedangkan KKM 60. Berdasarkan dapatan kajian dengan menggunakan ujian (peperiksaan) kelihatan dengan jelas bahawa

kemampuan kefahaman geometri pelajar Sekolah rendah di Bandar Padang masih rendah atau masih kurang.

Kata kunci: Geometri, kefahaman pelajar, dan sekolah rendah

PENGENALAN

Pembelajaran geometri masih banyak yang belum diajar pada kurikulum 2006 (Depdiknas, 2006). Dalam model pemikiran Van Hiele khususnya dalam pembelajaran Matematik geometri, proses belajar pelajar mengalami perkembangan kemampuan berfikir melalui tahap-tahap tertentu. Hal ini menunjukkan bahawa perlunya proses belajar mengikut tahap dan proses-proses tertentu. Dalam proses pembelajaran Matematik geometri, pelajar diarahkan untuk terlebih dahulu memahami konsep-konsepnya. Geometri merupakan topik Matematik yang sangat berstrategi untuk mendorong pembelajaran Matematik ke arah apresiasi dan pengalaman Matematik dengan cara belajar Matematik yang lebih bermakna. Sifat visual dan perwakilannya menjadikan geometri dapat menyokong pelajar untuk memahami konsep kekerapan dan pengukuran. Aktiviti pemecahan masalah dalam geometri merupakan aktiviti yang baik untuk perkembangan berfikir pelajar kerana ianya berhubungan dengan ruang, konstruktif, serta terkait dengan dunia nyata. Selain itu, posisi geometri seperti itu tidak banyak mempengaruhi proses dan hasil pembelajaran Matematik di kelas. Dalam suatu tinjauan mendapati bahawa pembelajaran geometri belum memberikan hasil yang selari dengan jangkaanserta rendahnya prestasi belajar pelajar pada materi tajuk geometri. Bahkan, pelajar yang berprestasi tinggi dalam bidang Matematik mempunyai pemahaman geometri yang masih rendah, misalnya dalam memahami konsep segitiga.

Konsep Segitiga merupakan salah satu topik geometri dalam Matematik sekolah di mana kebanyakan pelajar mengalami kesulitan terutama dalam mengungkapkan pengertian satah segitiga

dan menyusun serta menggambar satah segitiga yang sesuai dengan jenisnya. Geometri merupakan cabang Matematik yang membincangkan tentang titik, garis, bidang, ruang dan perkaitan antara satu sama lain. Selari dengan kenyataan Stein (2008) iaitu,

Geometry is the study of points, lines, planes, and space, of measurement and construction of geometric figures, and of geometric facts and relationships. The word "geometry" means "earth measure."

Menurut Stein (2008), pula objek Geometri bersifat abstrak. Hal ini jelas sekali selari dengan kenyataan Stien berkaitan pendapatnya tentang titik, garis, bidang, dan ruang. Sebagai contoh, penjelasannya tentang "luas garis" adalah seperti berikut "... A definite part of a line has length but no width or thickness. We cannot see a geometric line." Selari dengan itu, pengajaran Geometri di sekolah memerlukan kompetensi dan semangat guru yang baik.

Ekoran terdapat pelbagai pendapat yang berbeza, guru Matematik terutama guru di peringkat **Pendidikan rendah** dituntut untuk mampu menggambarkan objek geometri yang bersifat abstrak dan perlu berusaha mendapatkan alat bantu pembelajaran terutamanya yang berkaitan dengan alat bantu mengajar yang mampu memudahkan dan mempercepat pemahaman pelajar. Selain itu, pelajar perlu dilatih untuk menghasilkan suatu produk yang didasari konsep-konsep yang sedang dipelajari agar pembelajaran lebih bermakna. Kurangnya kesediaan setengah guru dalam menyiapkan alat bantu mengajar dan mengaitkan bahan pelajaran dengan kehidupan reality menyebabkan pelajar menjadi asing dengan manfaat yang seharusnya diperoleh hasil daripada pembelajaran Geometri. Hal ini harus dibantu dengan segera melalui model pembelajaran yang mampu mengoptimumkan keterlibatan pancaindera pelajar.

Berdasarkan huraian di atas, penulis ingin mengkaji secara mendalam permasalahan pembelajaran Matematik di Sekolah Rendah terutamanya konsep geometri di kelas IV Sekolah rendah. Kepentingan bagi kajian ini adalah dapat menentukan faktor-faktor

yang mendorong atau menyekat kemajuan berfikir geometri pelajar. Dengan demikian, penulis menjalankan kajian sebagai tinjauan awal untuk melihat sejauh mana kemampuan geometri pelajar kelas IV Sekolah rendah, khususnya di Bandar Padang, Sumatera Barat Indonesia.

Berdasarkan latar belakang diatas, maka persoalan utama yang perlu dijawab ialah: *Bagaimanakah kemampuan berfikir geometri pelajar Kelas IV SD di Bandar Padang?* Tujuan pengkajian ini adalah untuk mengetahui secara deskriptif kemampuan geometri pelajar Sekolah Rendah kelas IV di Bandar Padang, Sumatera Barat Indonesia.

MODEL PEMIKIRAN VAN HIELE

Salah satu aspek kognisi geometri adalah keupayaan spasial (ruang). Piaget & Inhelder (1971) { dalam Marliah (2008)}, menyatakan bahawa keupayaan spasial merupakan konsep abstrak yang meliputi hubungan spasial (keupayaan untuk mengenalpasti hubungan posisi objek dalam ruang), kerangka acuan (tanda yang digunakan sebagai penanda aras untuk menentukan kedudukan objek dalam ruang), hubungan proaktif (keupayaan untuk melihat objek dari pelbagai sudut pandang), konservasi jarak (keupayaan untuk mengira jarak antara dua titik), perwakilan spasial (keupayaan untuk mewakili hubungan spasial dengan memanipulasi secara kognitif), rotasi mental (membayangkan pemutaran objek dalam ruang). Keupayaan spasial diperoleh pelajar secara berperingkat dimulai dari pengenalan objek melalui persepsi dan aktiviti pelajar di persekitarannya.

Menurut John A. Van De Walle {yang diterjemahkan oleh Suyono (2008)}: "Visualisasi (penggambaran) dapat disebut sebagai geometri yang dilakukan melalui pemikiran." Hal ini merujuk kepada kemampuan pelajar menggambar dalam fikiran,

berfikir tentang sudut pandang yang pelbagai atau membayangkan hasil pantulan dan simetri. Semua aktiviti yang memerlukan pelajar untuk berfikir tentang bentuk atau mewakili sesuatu satah seperti yang dilihat secara visual membantu perkembangan visualisasi pelajar. Van Hiele (dalam Freitag, 2014) mendedahkan bahawa terdapat lima tahapan pelajar belajar geometri iaitu: tahap pengenalan, tahap analisis, tahap pengurutan, tahap deduksi, dan tahap ketepatan (akurasi) yang dijelaskan sebagai berikut:

Tahap Pengenalan (Visualisasi)

Pada tahap ini, pelajar mula belajar tentang suatu bentuk geometri secara keseluruhan tetapi masih belum mampu mengetahui sifat-sifat bentuk geometri tersebut. Sebagai contoh, jika seorang pelajar diberikan sebuah satah mendatar seperti segi empat sama, pelajar masih belum tahu sifat-sifat bagi satah tersebut seperti mempunyai panjang sisi yang sama dan semua sudut adalah sama besar.

Tahap Analisis

Pada tahap ini pelajar sudah mula mengenal sifat-sifat yang objek geometri yang diperhatikan. Sebagai contoh, pelajar sudah mampu menyatakan sifat-sifat satah mendatar yang dilihatnya.

Tahap Pengurutan (Deduksi Informal)

Pada tahap ini pelajar sudah mula mampu melaksanakan kesimpulan secara deduktif. Bagaimanapun, keupayaan membuat kesimpulan ini masih belum berkembang sepenuhnya. Selain itu juga, pelajar sudah mampu melakukan pengurutan pada tahap ini. Sebagai contoh, pelajar tahu tentang definisi segi empat sama iaitu segi empat yang mempunyai kesemua sisi yang sama panjang.

Tahap Deduksi

Pada tahap ini, pelajar sudah berupaya untuk membuat kesimpulan secara deduktif sepenuhnya iaitu membuat kesimpulan khusus berdasarkan perkara-perkara umum. Selain itu juga, pelajar sudah faham kepentingan peranan unsur-unsur yang tidak didefinisikan di samping unsur-unsur yang didefinisikan.

Tahap Ketepatan (Akurasi)

Pada tahap ini pelajar sudah mula menyedari kepentingan ketepatan prinsip-prinsip asas yang menjadi dasar kepada suatu pembuktian. Misalnya, pelajar tahu akan pentingnya aksiom-aksiom dan postulat-postulat *geometri Euclid*. Tahap ketepatan merupakan tahap berfikir aras tinggi, rumit dan kompleks. Justeru, tidak hairanlah sekiranya pelajar yang sudah berada di bangku sekolah lanjutan atas masih belum capai tahap berfikir ini.

Setiap tahap dalam model pemikiran van Hiele menunjukkan kekhasan proses berfikir pelajar dalam mempelajari geometri dan pemahamannya dalam konteks geometri. Kualiti pengetahuan pelajar tidak ditentukan oleh akumulasi pengetahuannya tetapi ditentukan oleh *proses berfikir geometri* yang digunakan. Tahap-tahap berfikir van Hiele akan dilalui pelajar secara berurutan. Dengan demikian pelajar perlu melalui suatu tahap dengan matang sebelum menuju tahap berikutnya. Kecepatan perpindahan dari suatu tahap ke tahap berikutnya lebih banyak bergantung pada isi dan metode pembelajaran berbanding umur dan kematangan. Oleh yang demikian, guru harus menyediakan pengalaman belajar yang sesuai dengan tahap berfikir pelajar (Kennedy: 2008).

METODOLOGI KAJIAN

Kajian ini dijalankan menggunakan rekabentuk kualitatif iaitu secara pemerhatian deskriptif. Pemerhatian yang dilakukan bagi melihat kefahaman geometri pelajar kelas IV Sekolah Rendah di Bandar Padang. Kajian ini dimulakan dengan tinjauan literatur sebelum pemilihan instrumen pengukuran kefahaman geometri pelajar dilakukan. Kajian ini berfungsi sebagai penghubung antara realiti pembelajaran geometri di dalam bilik darjah dengan pembelajaran geometri yang seharusnya dilaksanakan. Populasi bagi kajian ini adalah pelajar daripada semua Sekolah Rendah di Bandar Padang manakala sampel dipilih secara rawak. Berdasarkan data tentang klasifikasi peringkat sekolah, Sekolah rendah Percobaan Kecamatan Padang Barat mewakili peringkat atas, Sekolah rendah awam 14 Gurun Laweh Kecamatan Lubuk Begalung mewakili peringkat tengah manakala sekolah dengan kriteria peringkat bawah diwakili oleh Sekolah rendah awam 16 Pisang Kecamatan Pauh.

Teknik Pengumpulan Data

Untuk mendapatkan maklumat berkaitan kefahaman pelajar terhadap tajuk geometri, pelajar diberikan soalan ujian. Soalan ujian ini terlebih dahulu telah disahkan oleh pakar. Setelah ujian tersebut dianalisis, temubual dilakukan kepada individu-individu tertentu berdasarkan perbezaan permasalahan yang dikenalpasti. Temubual juga dilakukan kepada guru bagi mengetahui bagaimana proses pengajaran dilakukan. Pelajar juga ditemubual selepas proses pembelajaran bagi mendapatkan maklum balas berkenaan proses pembelajaran yang diikuti. Analisis ujian juga dilakukan bagi melihat strategi penyelesaian yang diguna pelajar bagi menilai kemampuan pelajar dalam memahami tajuk geometri.

Teknik Analisa Data

Kajian ini merupakan kajian kualitatif. Prosedur pelaksanaan kajian dimulakan dengan penyimpulan data. Proses pengambilan data melibatkan rakaman video, catatan lapangan, hasil pemerhatian dan hasil kerja pelajar. Dengan pemerolehan data tersebut diharapkan dapat mendeskripsikan situasi dan penemuan yang dapat memberikan informasi yang cukup terhadap penaakulan yang ingin dilakukan. Informasi tersebut memungkinkan pembaca untuk membangunkan penaakulan dan mengarahkan hujahan menuju suatu kesimpulan. Teknik analisa data menggunakan triangulasi data, teknik ini digunakan untuk melihat perhubungan yang diperoleh dari sumber data berbentuk catatan lapangan dan lembaran pemerhatian serta rakaman video belajar yang menjadi panduan pelaksanaan rekabentuk aktiviti instruksional.

Untuk penyimpulan digunakan teknik interpretasi silang, teknik ini digunakan bagi mendapatkan pertimbangan pakar dalam memberikan pandangan tentang data yang diperoleh seperti data video. Hal ini dilakukan untuk mengurangkan subjektiviti pemerhati dalam menginterpretasi data hasil pemerhatian yang diperoleh di lapangan. Walaupun penilaian dilakukan sepanjang pembelajaran berlangsung, kebolehpercayaan rekabentuk pemerhatian ini tidak dilakukan secara deskriptif kualitatif bagi menjaga konsistensi analisis data kualitatif dengan triangulasi dalam pengujian kredibiliti didefinisikan sebagai pemeriksaan data dengan pelbagai cara dan waktu (Sugiyono, 2011). Dalam implementasi kaedah pemerhatian, pengkaji menggunakan triangulasi sumber data yang berbeza melibatkan rakaman video kegiatan, karya pelajar dan beberapa catatan lapangan. Semua kegiatan rakaman video dan karya pelajar dikumpulkan. Kombinasi dari rakaman video dan karya pelajar dipilih untuk menguji kebolehpercayaan interpretasi berdasarkan pada satu klip video atau satu catatan lapangan.

DAPATAN KAJIAN DAN PERBINCANGAN

Di dalam kajian ini juga, pengkaji terlebih dahulu menentukan sampel yang akan terlibat. Diketahui bahawa jumlah Sekolah rendah di Bandar Padang sebanyak 390 yang terdiri dari 11 kecamatan. Berdasarkan data yang diperoleh, sekolah diklafikasikan sebagai sekolah peringkat atas dan tengah yang terdiri dari 132 buah sekolah manakala sekolah peringkat bawah terdiri dari 126 sekolah. Tiga sekolah dipilih secara rawak masing-masing mewakili klasifikasi peringkat sekolah Sekolah rendah Percobaan Kecamatan Padang Barat mewakili peringkat atas, Sekolah rendah awam 14 Gurun Laweh Kecamatan Lubuk Begalung mewakili peringkat tengah manakala untuk sekolah dengan kriteria peringkat bawah diwakili oleh Sekolah rendah awam 16 Pisang Kecamatan Pauh. Setelah sampel sekolah dipilih, pengkaji seterusnya merekabentuk soalan ujian yang akan diberikan kepada pelajar bagi mengukur kefahaman pemikiran geometri mereka. Soalan yang dibina ini disahkan oleh dua orang pakar iaitu Dr. Mardiah Harun, M.Ed dan Yullys Helsa, S.Pd., M.Pd.. Mereka merupakan pensyarah pendidikan Matematik di PGSD Universitas Negeri Padang. Berdasarkan hasil pengesahan soalan ujian, terdapat item yang dimurnikan mengikut cadangan pakar.

Seterusnya, ujian dilaksanakan di tiga buah sekolah terpilih. Hasil analisis mendapati bahawa pencapaian rata-rata pelajar adalah kurang daripada kriteria ketuntasan minimum (KKM). Spesifiknya, pencapaian pelajar di sekolah Sekolah rendah Percobaan Padang ialah 47.2 di mana KKM ialah 75, Sekolah rendah awam 14 Padang dengan purata pencapaian pelajar 50.9 di mana KKM 65 dan Sekolah rendah awam 16 Pisang dengan purata 27.1 di mana KKM 60. Berdasarkan hasil ujian jelas menunjukkan bahawa kefahaman pelajar di SD Bandar Padang terhadap geometri masih rendah.

Bagi mendapatkan data yang lebih jitu, pengkaji melanjutkan kajian dengan menemubual wakil pengetua sekolah, guru kelas serta pelajar berdasarkan protokol temubual yang dibina. Menurut wakil

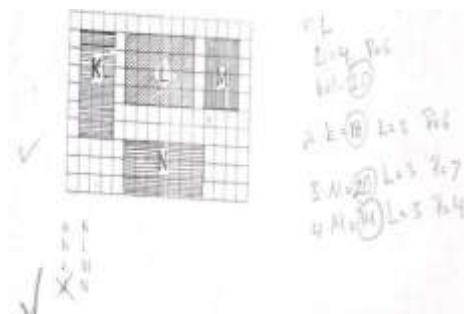
pengetua sekolah Sekolah rendah Percobaan iaitu sekolah peringkat atas, fasiliti pembelajaran Matematik khususnya bagi pembelajaran geometri sudah lengkap namun guru jarang menggunakannya seperti sudah menjadi bahan simpanan di stor. Hal ini kerana guru malas dan tidak tahu bagaimana menggunakan alat bantu mengajar tersebut. Selain itu juga, guru berasa keliru dengan perubahan kurikulum yang mengakibatkan kreativiti guru tersekat di mana mereka cenderung untuk hanya menunggu arahan tentang format pengajaran daripada pentadbiran negara. Tambahan lagi, guru belum memahami konsep itu sendiri. Sebagai contoh, luas bulatan $A = \pi r^2$, pelajar hanya tahu tentang nilai $\pi = 3,14 = \frac{22}{7}$ namun guru tidak menjelaskan bagaimana nilai π diperoleh.

Selain itu, tembual juga dilakukan bersama guru kelas IV iaitu ibu Mery Handayani, S.Pd..Menurut beliau, pembelajaran di kelas masih berlangsung secara konvensional. Hal ini kerana proses pengubahsuaian (renovasi) kelas IV masih dilakukan akibat gempa. Selain itu, biarpun guru berkenaan sudah mempunyai buku panduan guru, namun belum dapat difahami dengan baik kerana guru tersebut merupakan guru yang baru berpindah dari Bandar lain dan baru mengajar di Sekolah rendah Percobaan selama 6 bulan. Berbeza dengan yang diperkatakan oleh Guru Sekolah rendah awam 14 Padang (sekolah peringkat sederhana), kemampuan pelajar di sekolah tersebut rendah kerana salah satunya dipengaruhi oleh latar belakang pekerjaan orang tua yang sebahagian besarnya adalah buruh kilang getah yang hampir dengan sekolah tersebut. Beliau menyatakan bahawa pengaruh motivasi belajar dari ibu bapa juga menentukan pembelajaran pelajar. Sebahagian besar ibu bapa pelajar kurang memantau cara belajar pelajar di rumah. Berbeza dengan kenyataan pengetua Sekolah rendah awam 16 Pisang atau (sekolah dengan kriteria rendah) yang mengatakan bahawa sekolah mereka memang belum dilengkapi prasarana seperti media pembelajaran geometri selain kurangnya latihan bagi guru-guru mengenai penggunaan alat bantu mengajar. Tambahan lagi, sekolah tersebut masih belum mempunyai bahan bantu mengajar yang

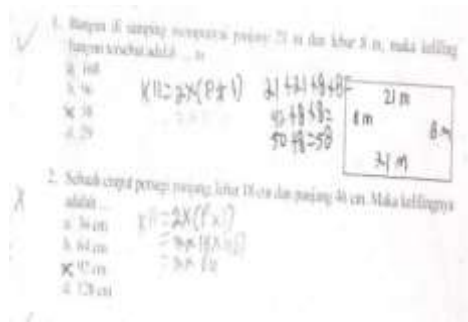
lengkap di samping guru yang juga kurang kreatif sehingga tidak ada inisiatif sendiri dalam membuat alat bantu mengajar. Bagaimanapun, pengkaji tidak dapat melakukan temubual bersama guru kelas IV yang sedang sakit.

Menurut guru kelas pula, guru tidak menggunakan alat bantu mengajar dan mengharapkan penjelasan dalam penggunaan alat bahan bantu mengajar geometri. Menurut guru kelas lagi, buku panduan guru yang dipakai guru di Sekolah rendah awam 14 Padang (Penerbit Intan Pariwara), dikatakan sangat membantu namun buku tersebut tidak menjelaskan bagaimana cara mengenalkan konsep geometri yang dimulakan dengan konteks di dalam kelas di samping soalan dan contoh-contohnya masih sama dengan buku teks pelajar. Justeru itu, guru berharap agar ada buku panduan khusus berkenaan geometri di kelas IV Sekolah rendah. Jika diperhatikan buku pelajar didapati juga bahawa buku pelajar tidak melibatkan soalan yang berkaitan dengan konteks persekitaran pelajar yang menunjukkan bahawa pembelajaran Matematik masih dilakukan secara abstrak.

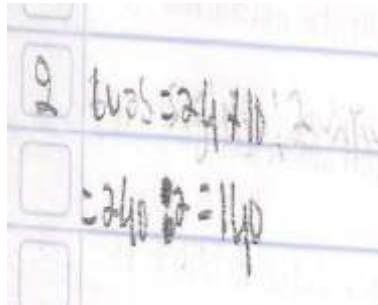
Selain itu, terdapat beberapa perkara yang dikenalpasti melalui jawapan yang diberikan pelajar dalam ujian.



Rajah 1: Helaian Kerja Pelajar 1



Rajah 2: Helaian Kerja Pelajar 2



Rajah 3: Helaian Kerja Pelajar3

Pada rajah 1 di atas didapati bahawa keupayaan pelajar bagi tajuk geometri bagi pelajar 1 masih rendah meskipun jawapan yang diberikan adalah betul. Biarpun pelajar menggunakan rumus, namun masih melakukan kesalahan dalam proses pengiraan pendaraban. Melalui temubual yang dilakukan, pelajar tersebut dapat menentukan satah mendatar yang paling luas dengan cara menghitung kotak-kotak dari satah mendatar tersebut. Didapati juga bahawa pelajar sebenarnya faham akan konsep namun mengalami kesulitan pada proses pengiraan melibatkan pendaraban. Berdasarkan teori van Hiele, pelajar ini masih pada tahap pengenalan dan kesulitan yang dialami ialah berkenaan *number sense* atau pada perhitungannya. Perhatikan pula situasi yang sama pada helaian kerja pelajar 2 di atas. Bagi soalan di atas, pelajar sudah mengetahui rumus namun kerana kecuaiian pada pengiraan

pada soal kedua, pelajar salah menjawabnya. Dalam memahami geometri, bukan sahaja pemahaman konsep diperlukan, namun kemahiran pengiraan disertai ketelitian (tidak cuai) sangat mempengaruhi pembelajaran geometri. Seperti yang ditunjukkan pada rajah 2, pelajar tidak lagi menggunakan formula tetapi masih melakukan kesilapan pengiraan. Berbeza dengan apa yang dialami Farhan (perhatikan rajah 3), Farhan dapat mencari luas pada soal subjektif yang pertama dengan menghitung kotak-kotak yang wujud. Hal ini menunjukkan bahawa tahap pengenalan menurut van Hiele dapat dikuasai dengan baik. Namun apabila diberikan soalan lain (objektif), Farhan tidak dapat menyelesaikan persoalan berkaitan perimeter. Berikut hasil temubual pengkaji dengan pelajar tersebut:

Pengkaji :Farhan, boleh jelaskan bagaimana cara mendapatkan jawapan bagi soalan nombor 1? Farhan :(sedikit bingung dan hanya menoleh)

Pengkaji :Apa formula mencari perimeter, Farhan?

Farhan :(tersenyum) hmmm....lupa Pak.

Pengkaji :Ketika belajar dulu dengan bu Anis, diberi rumus *tak*?

Farhan :Ada, tapi lupa.

Pengkaji :(dengan jadikan meja sebagai contoh) Farhan, yang manakah perimeter meja ini?

Farhan :(meletakkan jarinya di sebuah sudut, kemudian ditunjukknnya perimeter meja).

Pengkaji :Bagus, betul tu Farhan. Farhan sering main bola kan?

Farhan tahu yang mana perimeter lapangan bola kan?

Farhan :Tahu Pak, di tepi-tepinya?

Pengkaji :(memandu Farhan ke soalan objektif 1). Kalau pada rajah ini, manakah perimeternya?

Farhan :(diam sebentar dan menunjukkan perimeter segi empat tempat)

Pengkaji :Farhan, yang ini berapa panjangnya? (sambil menunjukkan sisi segi empat)

Farhan :(sambil dibimbing pengkaji, farhan dengan perlahan

mampu menunjukkan dengan jari perimeter dari satah segi empat sama tersebut). *Ini panjangnya 21, ini 8, yang ini 21 dan ini 8.*

Pengkaji :Jadi, jika kita mencari perimeternya, apa yang perlu dilakukan?

Farhan :(diam sejenak) Dijumlahkan.

Pengkaji :Tepat sekali Farhan!

Farhan :(sambil menghitung tanpa menggunakan rumus, tapi dijumlahkan saja kesemua panjang sisi segi empat sama) 58 m.

Pengkaji :Bijak.

Berdasarkan temubual, Farhan juga masih dalam tahap pengenalan selari dengan model pemikiran van Hiele. Hal ini kerana Farhan baru mengenal istilah perimeter namun belum boleh menggunakan rumus atau menganalisis bahawa rumus luas segitiga sama dengan $\frac{1}{2}$ luas persegi panjang. Maklum balas yang sama diberikan Umi Kalshum (Sekolah rendah awam 16 Pisang, kategori peringkat rendah). Strategi yang digunakan Umi Kalshum ialah dengan menggunakan pendaraban dan penjumlahan. Pelajar ini seperti keliru dalam menggunakan rumus iaitu perimeter segi empat sama perlu didarabkan atau dijumlahkan. Hal ini juga menunjukkan bahawa pelajar baru mencapai tahap pertama (tahap pengenalan) selari dengan model pemikiran van Hiele.

KESIMPULAN DAN SARANAN

Berdasarkan dapatan kajian dalam mengukur kefahaman geometri pelajar yang dilakukan di Sekolah Rendah Bandar Padang maka dapat disimpulkan:

- a) Secara am, sekolah peringkat atas, tengah dan bawah masih belum mencapai KKM yang telah ditetapkan untuk sekolah masing-masing. Purata pencapaian pelajar di sekolah Sekolah rendah Percobaan Padang 47.2 di mana KKM 75, Sekolah rendah awam 14 Padang dengan purata 50.9 di mana KKM 65, dan Sekolah rendah awam 16 Pisang dengan purata 27.1 di

mana KKM 60.

- b) Kurangnya kebolehan geometri dalam kalangan pelajar di Bandar Padang disebabkan belum adanya buku panduan bagi pelajar yang sesuai untuk memahamkan konsep geometri. Buku yang ada pula tidak membangkitkan keupayaan menaakul pelajar dalam berfikir secara geometri. Buku panduan yang digunakan guru pun tidak sesuai dengan keperluan guru. Kebanyakan soalan adalah samadengan soalan yang ada pada buku pelajar. Cara pengenalan konsep geometri juga masih minimum. Oleh yang demikian, guru tetap mengajar kecara konvensional yang menyebabkan pelajar lebih cenderung menghafal rumus sahaja.
- c) Berdasarkan moel pemikiran van Hiele, kemampuan pelajar Sekolah rendah di Bandar Padang mengenai geometri masih pada tahap pengenalan. Pola berfikir dan penaakulan geometri pelajar juga belum mampu ke tahap-tahap seterusnya.
- d) Kurangnya minat guru menggunakan media pembelajaran geometri di kelas kerana tidak tahu cara penggunaannya serta kesulitan untuk menghubungkan idea pemikiran geometri dengan alat bahan bantu mengajar yang ada.

Melalui kesimpulan di atas, maka dapat disarankan:

- a) Hasil kajian ini perlu dipertimbangkan sewajarnya kerana kebolehan pelajar dalam geometri di Sekolah Rendah adalah sangat penting untuk dikembangkan selari dengan tujuan pembelajaran Matematik pada kurikulum.
- b) Buku pelajar dan buku panduan guru perlu dihasilkan untuk mengembangkan keupayaan penaakulan dalam berfikir secara geometri pelajar Sekolah Rendah.
- c) Model pembelajaran geometri yang terdiri dari rasional, teori sokongan, lembaran kegiatan pelajar, rencana pelaksanaan pembelajaran dan sebagainya yang mudah, praktis dan efektif juga perlu dihasilkan.

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USING ONLINE COLLABORATIVE LEARNING ENVIRONMENT TO PROMOTE REASONING SKILLS

Ana Haziqah A Rashid, Nurbiha A Shukor & Zaidatun Tasir

ABSTRACT

Reasoning skill is an important skill as it can help students to construct knowledge based on what they have been taught and lead to improvement in their achievement. The purpose of this study is to point out the importance of reasoning skill in students' learning, student problem in reasoning skill and propose the potential method to investigate students' reasoning skill. Most of the students' are having problem to justify their opinion while learning. Other than that, students are also being too dependent on their teachers while getting the information for learning. This situation will inhibit student from thinking critically and lead to low development of reasoning skill among the students. From the study, we found that online collaborative learning environment is one of the potential methods to encourage students' reasoning skill. Hence, it will be interesting to further research the influence of online collaborative learning environment on students' performance and students' collaborative reasoning skill.

Keywords: Reasoning Skill, Collaborative Learning, Online Learning

INTRODUCTION

Reasoning well is important to human beings, since it promotes sound beliefs and also improves the development of the reasoner's mind (Hitchcock, 2012). In learning, reasoning skills are also important to students in helping them to develop what they have been taught. According to Ates and Cataloglu (2007), students' reasoning skills are positively correlated with course achievement. Students' reasoning skills are also evident in their problem-solving (Lin et al, 2014). Additionally, reasoning skills help in the development of reasoning critical thinking and higher order thinking while the students are seeking additional knowledge.

Thus, it is essential to investigate the reasoning skills students employ in their learning, particularly in the online collaborative learning environment. In this study, we briefly describe what is the importance of reasoning skills in student learning. Next, we will explain the challenges for students in developing reasoning skills. Finally, we will suggest a potential method for promoting reasoning skills in students.

REASONING SKILLS IN STUDENT

Reasoning consists of complex skills that must be taught. It helps people to create new beliefs, generate knowledge and make better decisions. Researchers have shown that reasoning involves important skills for student learning such as problem solving (Lin et al, 2014; Ates and Cataloglu, 2007), decision making (Lohman and Lakin, 2009), critical thinking (Ates and Cataloglu, 2007), metacognition (Lin et al, 2014) and knowledge acquisition (Lin et al, 2014). In addition, reasoning skills will encourage students to consider experiences, review choices, explain answers and apply what is learned to real-life situations. It is important for students to develop their reasoning skills in order to be able to resolve complex issues.

In relation to that, lack of reasoning skills can affect a student's understanding and learning process. High achieving students will usually have good reasoning skills (Johnson and Lawson, 1998; Shayer and Adey 1993). A study by Jensen et al (2014) about the relation between reasoning skills and conceptual knowledge. Found that students with higher reasoning skills have a greater ability to answer the question related to procedural skills. Students' academic achievement can be affected if they do not have good reasoning skills. This might be due to the fact that students who do not have reasoning skills tend to simply answer questions without thinking further about the reasons behind the answers.

Student Challenges In Gaining Reasoning Skills

Many students are incapable of providing reasons to justify their opinions. Reasoning requires students to go beyond the information that is given. This can be a problem for students if they are dependent on their teachers for information and do not independently seek it out. They have no desire to further explore the information given and tend to blindly accept information. Students need the self-motivation to explore, thus enriching their knowledge. This will allow them to explain facts rather than just accepting them. Ryan and Deci (2000) have stated that self-motivation is important in learning because it helps students to obtain positive results and can improve active learning (Pintrich, 2003).

Other than that reluctance to seek additional knowledge can indirectly inhibit the students' development of reasoning critical thinking and higher order thinking. According to Dwyer, Hogan and Stewart (2014), students who can justify and argue their material are thinking critically. This is because students who can argue will usually think deeply while learning (Lin et al, 2014). A study by Lin, Hong and Lawrenz (2012) states that students who are able to use rebuttals to justify their positions are thinking more

deeply and critically compared to others.

Additionally, lack of reasoning skills may also lead to difficulty in learning other subjects. For example, many students face difficulty in writing formal proofs which require them to have good reasoning skills (Wong and Bukalov, 2013). This is supported by Kidder, (2008) who argues that students often have difficulty expressing and sharing what they have learned. This happens when students do not have good reasoning skills and cannot express what they have learned critically. Research by Blanton and Stylianou (2014) points out that reasoning skill enable the student to express critically what they have learned in term of writing proofs. While writing proofs, students also gain the ability to critique, clarify, justify, explain and elaborate, which are important skills in reasoning.

Another problem faced by students who lack reasoning skills is difficulty in integrating the information they receive in the learning context (Hester et al., 2014). This could lead to difficulties in making connections between what they have learned, and a need for more instructional guidance (Chiu and Linn, 2013). Students often have restricted ideas which demonstrate a lack of critical thinking, leading to a low level of reasoning skills. Because of this, students will not be able to translate evidence and empirical data into ideas and theories (Choi, Klein and Hershberger, 2014).

Reasoning skills can be improved through a proper, structured instructional approach. There are many instructional approaches that can be useful to promote reasoning skills. For example, Acar (2014) used argumentation-based guided inquiry to foster reasoning skills, including a scientific reasoning test and a conceptual knowledge test. However, the conceptual knowledge test used did not have well established reliability, even though students' reasoning skills were increasing.

The Scientific Heuristic Writing approach another argument-based inquiry approach has also been used to foster reasoning skills among students. Choi, Klein and Hershberger (2014) have used this approach to investigate student reasoning skills and found that it

helps in stimulating students' excitement, enthusiasm and engagement in the classroom; increases students' progress and builds confidence with inquiry; fosters students' creativity and engagement in negotiating ideas. Nevertheless, while the approach has advantages, it also has limitations. Students still have difficulties in making decisions in relation to generating questions, designing procedures, proposing claims and providing evidence. In addition, students also have difficulty in expressing their thoughts and ideas in written form although they can express them orally (Choi, Klein and Hershberger, 2014).

REASONING SKILLS AND COLLABORATIVE LEARNING

Many studies have been done to investigate reasoning skills using collaborative learning. They consistently demonstrate that collaborative learning helps in enhancing students' reasoning skills (Clark et al, 2003; Kidder, 2008; Jadallah 2009; Kim, 2014). This may be due to the features of collaborative learning where it encourages fair participatory opportunities (Ngeow, 1998). In addition, collaborative learning also encourages the use of high-level cognitive strategies, critical thinking, deep learning, deep understanding and positive attitudes towards learning. It also provides learners with a more open and flexible means of working collaboratively with their peers (Wang and Lin, 2007). Collaborative learning also enables learners to share alternative viewpoints, support each other's process of inquiry and develop critical thinking skills, including the ability to reflect (Ngeow, 1998), which is an important aspect of reasoning.

The purpose of collaborative learning is to enable students to learn by working together to solve learning tasks. By working together, students have the chance to express their ideas and opinions, developing their reasoning skills by critically discussing a certain topic. However, collaborative learning can only be effective

when the core aspects interdependence, individual accountability and interaction have been taken into account and implemented (De Hei et al, 2014). Collaborative learning also has several limitations including the assessment of the collaboration process (De Hei et al, 2014). Hence, by using collaborative reasoning, we can solve the assessment issue by measuring the collaboration process by looking at students reasoning skills. This is because collaborative reasoning has been designed with clearly defined procedures and guidelines by previous researchers.

COLLABORATIVE REASONING IN ONLINE LEARNING

Although collaborative reasoning may be the best method for enhancing students' reasoning skills, it must involve technology to make it more effective. This is because using technology such as online learning discussion to perform collaborative reasoning is more time consuming compared to face-to-face discussion. In this way, the collaborative reasoning discussion will not disrupt teaching and learning in the classroom. Moreover, online learning discussion is more practical because the student and teacher do not have to be in the same place to conduct the discussion. Another advantage of using the online learning environment is that students can express their opinions and ideas without being interrupted by others as in face-to-face discussions (Kim, 2014). In the online learning environment, students can take turns to offer ideas. It also allows time for students to think critically before expressing their thoughts.

CONCLUSION

There is a need to carry out research to investigate the reasoning skills used by students engaging in discussions in the online collaborative learning environment. It is also interesting to know if the online collaborative learning environment can influence

students' performance and collaborative reasoning skills. In addition, it is also significant to study the effect of scaffolding in the development of students' reasoning skills in the online collaborative learning environment.

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MOBILE AUGMENTED REALITY: ENHANCE VISUALIZATION SKILLS IN LEARNING ABSTRACT CONCEPT IN CHEMISTRY

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Yahaya

ABSTRACT

Advanced technology that emerged in education has brought changes in lifestyle which students has improved their communications and expose to vast quantities of information nowadays. This rapid increase of the technologies' development causes the students using variety of media that can be used from various locations in an effort to provide the educational needs of the growing populations. This review paper discusses the problems that occur in school recently which focusing on the difficulties of the student to visualize the abstract concept in Chemistry. Abstract concept especially in sciences requires students to use their visualization skills in understanding the concept and technologies is proven one of the way that may help in enhancing the visualization skills. Therefore, there are a lot of advanced technologies being invent in helping students to do the visualization. One of the advanced technologies that potentially to be applied in education in order to help in solving the problems is Augmented Reality (AR). AR is frequently discussed when it comes to the topic of visualization because it have an advantages in helping students to view the abstract images in differences angles. Thus, there are also some discussions on the potential of AR used in mobile devices

which called Mobile Augmented Reality (MAR) in enhance visualization skills in learning abstract concept which focusing on the subject of Chemistry.

Keywords: Education, Augmented Reality, Chemistry

INTRODUCTION

For the last few decades, integrating technology in teaching and learning in the classroom has been an important issue. According to Lee et al. (2013), there are several meta-analyses have been conducted in order to examine the specific modes or educational practices that can enhances the effectiveness of student learning and teaching with technology. The digital technologies that being used is now not limited to the usage of computer only. There are others digital technologies also arise which are the mobile devices, digital media creation and distribution tools, video games and social networking sites (Collins & Halversont, 2010).

The NMC Horizon Report: 2013 Higher Education Edition listed out the six technologies that to highlight emerging technologies with considerable potential in education. One of the technology is tablet computing. The benefit of using the tablet computing is it's relieve the burden of complex IT infrastructure management but also involves the cost savings on the maintenance of the applications (Chandra & Borah, 2012). Besides, the development of this technologies also generate a considerable amount of excitement among academics because it transforming traditional learning to tablet learning. (Kim, 2012).

One of the examples of the tablet computing application that integrating technology in education is Augmented Reality (AR). Many researchers believe that this integration can improve student learning and performances (Chen & Tsai, 2012). According to Clemens, Purcell and Slykhuis (2013), AR is a live, direct or

indirect, view of a physical, real world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data. The latest technologies in AR are MAR which AR had been used in the mobile applications (Danakorn et al., 2013). Danakorn et al. (2013), also stated that MAR have make a learning more meaningful and overall participants from the previous study felt motivated, enjoyed and show a positive educational effects on participants. This will improve the engagement in the learning performances of the students.

PROBLEM BACKGROUND

The advanced technology that emerged in education is now being explored in order to solve the problems in the teaching and learning process. This is because the traditional chalk and talk teaching method and the use of static textbooks are failing to engage students and leading to poor learning outcomes. According to Mcclenney and Greene (2005), the students claimed that every week chalks and talks routine is boring and this lead to the decreasing of the engagement of students to the subject. Technology is one of the solutions to help in solving this problem which technology encourages active learning and computers application rarely make the students bored (Marshall, Cartwright & Mattick (2004). Besides, nowadays the energetic generation need challenges and often bored in traditional classroom and they prefer quick interactions with content which required visualization skill (Black, 2009). In addition, Wu, Krajcik & Soloway (2001) also claimed that computerized models can serve as a vehicle for students to generate mental images which then will help the students visualize and understand better.

Difficulties to visualize the abstract concept in Chemistry.

Chemistry is one of the electives science subject and the core to the others part of sciences which is less interested by student in Malaysia. This is because they found it is hard to understand. Chemistry is a sciences subject that will equip the student with the knowledge that can help them in problem solving, decision making and also will need they think critically and scientifically in order to find a solution. There are many researches (Nahum et al., 2004; Daniel, Kang & Sai, 2001; Ozmen, 2004) have been conducted that shows the students are weak in Chemistry and they always fall in the misconception problems. According to Uzuntiryaki and Geban (2005), students have difficulties in understanding most of the abstract concepts in Chemistry and hold misconceptions which lead to the prevention of meaningful learning.

Palmer (2001) claimed that misconception among the student has to be taken into account because it can interfere with student's learning of scientific principles and concepts. There are many researches (Nakiboglu & Tekin, 2006; Stefani & Tsaparlis, 2009; Duis, 2011) have been conducted in identifying student's misconception in Chemistry. Thus, selection of teaching method plays an important factor in avoiding the student's misconception (Palmer, 2001).

Chemistry will be the topics that commonly will involve when talking about the problems in the visualization in sciences education. This is because Chemistry is a visual science which visualization plays a major role in daily practices (Wu & Shah, 2004). Chemical Bonding is one of the examples of basic topic which contain an abstract concept that cannot be directly applied to everyday life. Thus, students faced difficulties in understanding the chemical bonding concept (Uzuntiryaki & Geban, 2005).

Nahum et al. (2004) stated that from the research conducted around the world, it's shown that the concepts associated with chemical structure and bonding, such as molecules, ions, hydrogen bonds, and giant lattices are abstract. These abstract concept will

create a difficulties that may lead to misconception because of the students have a fundamental misunderstanding. As example in chemical bonding, there is great potential for the formation of alternative conceptions as students try to derive meaning from what is said by the teacher or what is written in the textbooks because the concepts of the topic is abstract (Daniel et al., 2001).

Besides, scientific concepts are complicated because many scientific ideas and models are too sophisticated to be taught in schools. Thus, in Taber (2001) research he suggests that school curriculum should include representations of science. There is also research by Kelly and Jones (2008), which found that many students are able to correct their misconceptions after viewing either static molecular visualizations or animations (Jones et al., 2008).

According to Mohd Nor and Nur Afza (2010), they make a conclusion from their research that there are few problems in the study of chemical bonding that lead to the misconception among the students. There are students which cannot identify the type of bonding and still answering single and double bond instead of the right answer which are covalent and ionic bond. Besides, they also found that the students cannot identify the conditions of every chemical bond that form between the elements. Students also not master in drawing the diagram of the electron sequences for the ionic compounds and covalent compounds. Thus, make the diagram that they are drawn become dysfunctional. Other than that, the problems in the topics of chemical bond that exist among the students are they cannot draw the Lewis structure in the right way. This is because they do not understand the concept and they cannot visualize the abstract concept (Mohd Nor & Nur Afza 2010).

Thus, effectives teaching strategy or new tools to enhance the teaching and learning qualities which can help in the visualization of abstract concept in Chemistry for example chemical bond should be developed. According to Campbell et al. (2010), tools or technologies in classroom learning is good to enhances visualization of complex concept and also will eventually facilitate

communication and collaboration between the students. Besides, the visualization skill also can be improved with the help of technology which it have ability to mentally manipulate complex spatial dimensional and 3D figures (Tsai and Yen, 2014).

Potential Technologies in Visualization the Abstract Concept in Chemistry

According to Wu, Krajcik & Soloway (2001), many students have difficulties in learning symbolic and molecular representation of Chemistry. To promote understanding of chemical representation, a computer-based visualizing tool, eChem had been introduced to the students which allowed them to build molecular models and view multiple representations simultaneously. They also prove in their research that, to help students understand Chemistry, technology can be used a learning tool this is because multiple link representations that represent by multimedia allows students to visualize the interactions among molecules and avoid the misconception related to the chemical concepts.

There are a lot of technologies in education that aiming to help students in visualization which is including simulation and animation. According to Prinz, Bolz and Findl (2005), the technology such as simulations has limitations which the resolution of the videos is not consistent and the quality of the videos also low which the students have to replay many times to make them understand. Besides, Falvo (2008) claims that because there are recent advances technology is available and develop the possibilities of research related to animations and simulations in education are becoming low. Falvo (2008) also said that researcher must keep exploring the best visualization technologies to be integrating in modern classroom to make sure the learning process is efficient.

With the existing of AR in education, the technology can be used in Chemistry field on solving the misconception among the students. There are because many processes, ideas and concepts

can be better illustrated using both images of the real world and graphics (Sighal et al., 2012). According to Gudyanga & Madambi (2014), the strategies of using visualizing tools as ways of minimizing learners misconception is a good initiatives because it will make teaching and learning environment more visual than conceptual so that student can understand the concept better.

MAR ENHANCE STUDENTS' VISUALIZATION SKILLS

If referring to Horizon Reports from 2004 to 2011 they reported that they highlighted the potential of mobile devices to be adapted in the future. Thus, AR is now being developed and designed to be integrated in a mobile devices. According to the Martin et al. (2011), the mobile technologies most likely will affected the education fields. Besides, Martin et al. (2011) also stated that the current and the most potential mobile technologies that expected will be emerged widely is mobile augmented reality (MAR). MAR provide the user ease which it is not constraining the user to used it in specific areas (Hollerer and Feiner, 2004). Houser, Thornton and Kluge (2012) stated that mobile devices have advantages over desktop PCs because mobile devices have the ability to move with its user.

AR is proven can enhance the visualization skills of the student. This supported by the statement claimed by Kalfoken et al. (2011) which they said that AR is a powerful visualization tool for exploring real world structures along with additional contextual information. AR also shows a great potential in visualization which it's also increasing the understanding and ease the learning of Chemistry for students by visualizing and controlling virtual models of molecules in the research by Maier, Klinker & Tonnis (2009). Beside of the advantages of AR in enhances the visualization skills, AR also shows a good responses from the participants that experiencing the AR technology.

AR by Burton et al. (2011) shows a result that participants were

clearly excited about the potential that this technology has for sharing information and learning about new concepts. The usage of AR using a smartphones is also known as mobile augmented reality (MAR) allows a learning experience that is linked to the formal classroom, so that students can learn outside of class hours and outside of school limits (Burton, 2011). Future research suggested by Lamounier et al. (2010), is to improve the internet portability in order to facilitate users access to the system and students and potential users can use it anytime and anywhere. This will give opportunity to the students to use AR using a smartphone which gave first-hand how powerful AR can be as a learning tool and were inspired by the amount of content knowledge they gained and maintained due to their interaction with the smartphone activity. This is suit with the harness development of MAR in education field as reported in the Horizon Reports 2004-2010.

CONCLUSION

As conclusions, from the above statement its proven that technology especially AR really can be used in order to enhances visualization skills. It's also may help the students to encounter the difficulties in visualization of abstract concept in Chemistry. Based on the meta-analysis from the previous researches that been conducted on AR, there are a lot of applications had been developed on several fields and not limited to education. The use of AR in education, particularly mobile learning is still in their early phase which it stills in the phase of changing and improving but from the research it shows that AR can be used very successfully for situated and constructivist learning, particular where collaboration and student inquiry take places. Furthermore, mobile phone or tablet computing professed high degree of comfort and familiarity with the affordances available with the technology which it's enhances portability compared to laptops. So, MAR should be explored more to discover the potential that exist for improving the

process of teaching and learning.

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PRESCHOOL TEACHERS PERCEPTION ON TEACHING & LEARNING MODULE TO ENHANCE PRESCHOOL CHILDREN'S EMOTIONAL INTELLIGENCE

Nor Aizal Akmal Rohaizad & Azlina Mohd Kosnin

ABSTRACT

Socio-emotional development is among the main pillars in preschool curriculum and emotional intelligence is a main element in this aspect of development. A preliminary study conducted by the researchers found that preschool teachers in Malaysia are having problems teaching the socio-emotional components due to the lack of specific teaching tools, guidance and structure in teaching this important element. In this study, a teaching module was developed to help preschool teachers in pedagogy of emotional intelligence (EI) to enhance the preschool children's EI in Malaysia. This module was developed based on Gagne Information Processing Theory, Bandura's Social Learning Theory and The Zone of Proximal Development (ZPD) Theory by Vygotsky. The module includes ten topics which cover all elements of EI: indentifying emotion, understanding emotion, controlling emotion and using emotion. Activities were designed for each of these elements and in-service teachers were the ones who taught the children using the module. The effectiveness of this module was examined through an interview among the preschools teachers (experimental group) who using the module. Results show both preschools teacher in

experimental group satisfy with the effectiveness's teaching and learning module to enhance preschool children's emotional intelligence. It is significant increase of children's emotional intelligence in the experimental group. These findings suggest that the module can be a useful tool for preschool teachers to help develop preschool children's emotional intelligence.

Keywords: Socio emotional development, emotional intelligence (EI), module of teaching and learning, preschool.

INTRODUCTION

Many studies have found significant relationships between Emotional Intelligence (EI) and future success in education (Fantuzzo, Bulotsky, McDermott, McWayne, Frye & Perlman, 2007; Izard, 2004; Raver & Knitzer, 2002). Children who are able to apply EI would have better academic achievements (Elias & Weisberg, 2000; Payton, Wardlaw, Graczyk, Bloody, Trompsett & Weissberg, 2000). According to Denham (2006), children who have higher EI are more apt to follow teacher instruction, pay attention, listen and solve problems with patience. Positive emotional skills instilled in children can allow them to develop EI and can shape behaviors which can assist children in learning and eventually to achieve better academic results (Ulutas & Omeroglu, 2007) as children with greater EI are better able to cope and control unexpected circumstance such as frustration, anger, sadness and so on (Mohd Radzi, 2004).

EI is important in a wide variety of contexts in any person's life as Martines (1997), Kirch and Tucker (2001) have noted that individuals who are successful in life (i.e. in carrier) use only 20 percent of intellectual intelligence compared to 80 percent of EI. Goleman (1995) has also noted similar findings. In addition, individuals who have a higher level of emotional control are better able to lead good relationships with others through their social

skills such as communication, building consensus and efficiency in influencing others (Omstein & Nelson, 2000).

It is well established that EI is very important in our lives. However, at the preschools under the supervision of the Ministry of Education (MOE) in Malaysia, EI is not given exclusive attention and the curriculum provided by the MOE only considers EI as a pillar along with other pillars that are important such as language, mathematics, etc. (Standards of National Preschool Curriculum, 2009). Therefore, in an initial study, it was found that majority of preschool children (in southern part of west Malaysia) experienced problems related to the socio-emotional pillar especially the Emotional element (Nor Aizal Akmal, Azlina & Nora, 2012).

According to the preschool teachers in the area (where the current study was conducted i.e. Johor) there were several problems that prompted the researchers to undertake research on this topic. One of the main problems was about the limited available teaching aids or specialized modules that can be used in the teaching and learning of EI. A need was felt for a special teaching aid that may help promote EI from a developmentally informed aspect. This is because it can help enhance students' understanding of what they are learning as well as help teachers smoothly deliver what is being taught to the students (Ismail, 2002). According to Fleming and Baunme (2006) the availability of teaching aids could serve as a description of the learning process or can also be used as a reference to facilitate the learning process.

To the best of our knowledge, there is no available module aimed specifically at enhancing EI in Malaysian preschoolers, so the unavailability of such modules makes it difficult to teach and disseminate information regarding EI to students. Teaching and learning of EI and other elements in the socio-emotional pillar (of Malaysian preschool curriculum) mostly relies on storytelling alone. The practice of supporting EI using only one method makes it prone to shortcomings and could be made better using multiple teaching methods.

Therefore, we produced a module which involves a number

of activities based on certain theories so that teaching and learning of EI may become smoother and easier for students to understand and to support their development of EI. From what has been discussed before, which involves preschool children learning style and also problems experienced by teacher in the teaching and learning of EI in the Malaysian context, we selected a number of theories (information processing theory, social learning theory and the theory of Zone of proximal Development) which were synthesized in the form of a teaching and learning module. This EI module was aimed at becoming a tool for teachers to teach emotional skills effectively. Moreover, this module was made in such a way that the students may find it easy and fun to learn emotional skills which encourage them to develop better EI. Enhancing EI was at the core of this module and all the theories mentioned earlier were consulted to have their say in terms of emotional development.

PROBLEM STATEMENT

An early study was conducted by some of the present researchers at several preschools at Johor Bahru, Malaysia and it was found that preschool children are weak in mastering the elements of EI which is contained under the socio-emotional pillar of the national curriculum for preschoolers (Nor Aizal Akmal, Azlina & Nora, 2012). Apart from that, the results of interviews conducted with preschool teachers indicated that the elements of EI and other elements under the socio-emotional pillar (of the national curriculum) were not given proper importance by the curriculum forming authorities and the said pillar has only been used as an ancillary pillar only to be combined with the others pillars which are considered important such as science and technology pillar, communication pillar and so on. Whereas EI is very important and its elements ought to be given importance as it helps construct an individual's life trajectory and may drive them in the right way to

life (Mohamad Idham, Zamri, Melor & Nik Mohd Rahimi, 2010). In addition to the above problem, another problem is that of limited teaching aids or teaching and learning specific modules to enhance EI elements that can be used as a guide or facilitator for preschool teachers to facilitate them in teaching and learning processes undertaken. This scarcity of resources is particularly high in Malaysian context. Due to this dearth of available resources, preschool teachers in Malaysia find it difficult to carry out the teaching and learning. Moreover, there are limited specific modules available that provide information or knowledge about planned and systematic use of instructions to emotionally support and facilitate preschoolers. The teachers added that most of the teaching and learning process of EI and other elements under the socio-emotional pillar are just run only by some talk and storytelling and this makes it difficult for the students to understand the information received and thus somehow reduces their interest in learning and attention in class. According to Norasyikin and Faridah (2008), a compilation of modules accordance to the syllabus content, will successfully make the process of teaching and learning become effective and also fun for students.

The module is a pedagogical tool for teachers to provide the teaching and learning environment with different options (apart from the pre-designed curricula). Teaching modules can help teachers save time to implement the teaching and learning processes and help achieve teaching objectives with relative ease (Norasyikin & Faridah, 2008). According to Mohd Faizal (2004), teaching module is a concrete material that can serve as a catalyst for the success of teaching and learning. At the same time, the use of these modules can strengthen students' understanding of the things they have learned.

THEORETICAL FRAMEWORK

Teaching and learning module to help develop preschoolers' EI was

created involving a number of theories i.e. Gagne Information Processing Theory (1974), Bandura's Social Learning Theory (1986) and Theory Zone of proximal Development (ZPD) by Vygotsky (1997).

The use of module in teaching and learning can encourage children to understand faster and the information can be transmitted through many different activities. Teaching and learning process will be more interesting with a variety of activities that can be included in the module. Figure 1 show the theories that have been used to produce the teaching and learning module to enhance preschoolers' EI.

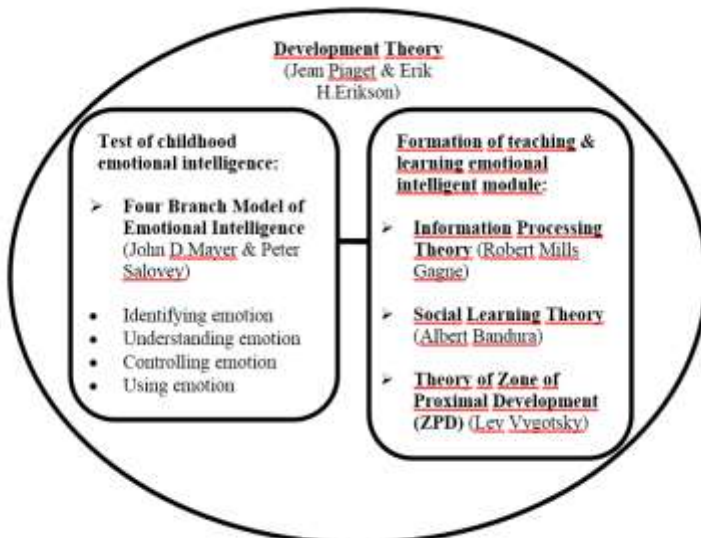


Figure 1 Theoretical Framework

The present research was conducted with children at the preschool level. According to Piaget's Theory of Development (1896-1980), children at this stage have an egocentric nature that will make it difficult for them to distinguish between delusions and reality. These children usually can only think of specific examples known as transductive. For them, every experience and all points of view of others are similar to what they themselves have (Mok, 2008).

Based on the Development of Erikson's Theory (1950), the children at ages three to six years, will do things that are not fully aligned with their age due to the ongoing cognitive and physical development. If children feel criticized while experiencing curiosity, it will cause them to feel guilty and they will not take initiative in doing an activity again. Thus, the tug of war between the motivation to do new things and the prohibition to not try new things goes on. It is needed that adults promote well-meaning feelings in the children. Therefore, such children need the help of adults or peers who are better able to guide and an easily disclose the learned things. This method will involve the Zone of proximal Development (ZPD) theory by Lev Vygotsky (1997) to support it. According to Vygotsky (1997), students who experience learning difficulties can be resolved when getting modeled help from an adult or collaboration partners. Student performance can also be expanded to higher levels of potential. However, children also need an example to be imitated in order to facilitate the learning process. This process has been explained through social learning theory by Albert Bandura (1986). Bandura (1986) suggested that indirectly children will learn a behavior change when observing the process and outcome of others' behavioral changes. This process is called *modeling*.

However, each stimulus received from the external environment which aims to simplify the process of learning, will depend also on the degree of information processing received in the nervous system through the human senses such as hearing, sight, touch, action and so on. We used the information processing theory by Gagne (1974) to explain how this process occurs. According to Gagne (1974), to facilitate new learning, people need old experiences that are stored in long-term memory which associate to the new experiences. Therefore, to facilitate the new learning process, we conduct an attractive activity which was contained in the module. With an activity being undertaken plus guidance from teachers and friends, teaching and learning process will be easier and will not boring (Aszoura, 2007). Children can see and apply the

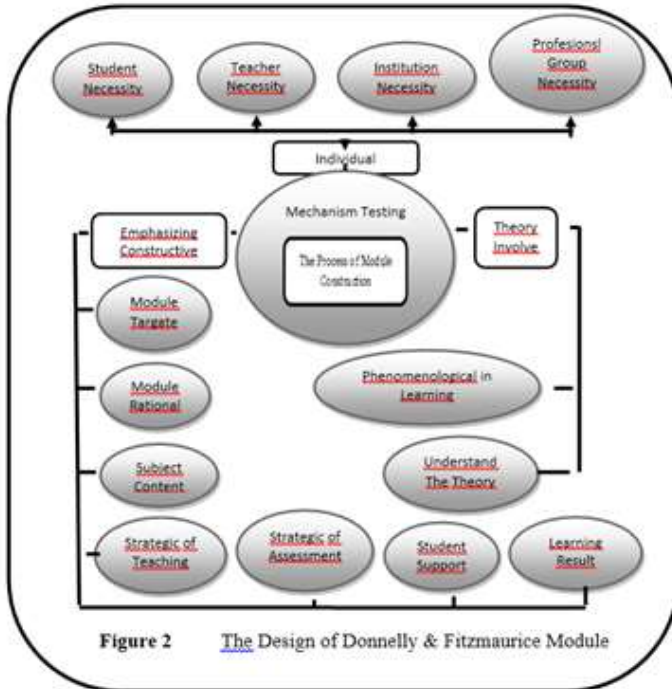
material learned in lessons. This will enhance their understanding through the teaching and learning process.

In addition to facilitating teachers in the teaching and learning processes, it was aimed by the present study to tap the level of preschool children's EI stages i.e. to know the level of EI before and after the teaching and learning modules run. Theory used to assess the children EI is through the Four Branch Model of EI by Mayer and Salovey (1997). Through this model, Mayer and Salovey agree that individuals who are able to achieve the harmony of life are those who can master the four branches of EI namely identifying emotion, understanding emotion, controlling emotion and using emotion. Accordingly, all theories and models involved were used to create the module revolving around these four aspects. So in a way, Mayer and Salovey's (1997) model served as the spine of our teaching and learning module to promote the enhancement of preschool children's EI.

DEVELOPMENT OF TEACHING MODULE

Teaching module was developing to help preschool teachers in the pedagogy of emotional intelligent (EI) to enhance the preschool children's EI in Malaysia. Figure 2 show the Design of Donnelly & Fitzmaurice Module.

We used the design of Donnelly and Fitzmaurice (2008) module as a guide to develop the module of teaching and learning of emotional intelligent (EI) for preschool children. As per Donnelly and Fitzmaurice's (2008) module design, theory is very important in the development of any module. Our module was developing based on Gagne Information Processing Theory, Bandura's Social Learning Theory and The Zone of Proximal Development (ZPD) Vygotsky Theory.



The duration to implement the module for the preschool children was about six weeks. It includes ten topics to cover all the EI elements. There are four of EI elements which are identifying emotion, understanding emotion, controlling emotion and using emotion. Each of these elements has been focused with a suitable activity in which a teacher may help raise that particular element in the children. The implementation of our teaching and learning module of EI was conducted by preschool teachers. The effectiveness of this module was examined through an experimental study involving 100 preschool children who were assigned into either experimental group or control group. To assess the preschool children's EI, we measured it using the Sullivan Emotional Intelligence Scale for Children (EISC) which was adapted for Malaysian participants.

METHOD

The participants consisted of two preschool teachers who were involved in the experimental group. Researcher was use the interview process to identify the preschool teachers perception on the effectiveness of teaching and learning module to enhance preschool children's emotional intelligence (EI).

RESULT

1. The perception of pre-school teachers on teaching and learning modules in enhance preschool children's' emotional intelligence.

Table 1(*Appendix A*) show the perception of preschool teachers on the effectiveness of teaching and learning modules in enhance preschools children's' emotional intelligence. Based on Table 1 show that in term of allocation of time for exercises to carry out an activity module, available time is feasible. Modules are concise. Easy to be referenced and easy to find specific parts when necessary. This is because the learning materials are contained in the module is structured and organized. Apart from that, both preschool teachers agreed that the activities are carried out in accordance with the level of pre-school children age. In addition, using the module can attract students' interest and attention to actively implement the activities provided. In terms of the elements of emotional intelligence which are applied to the module, according to the pre-school teachers, the preschool children are able to identify emotions himself and others, are able to understand the emotions, being able to understand the emotional changes, being able to control emotions and be able to use emotions towards a positive attitude when given an appropriate stimuli and activities available in the module. So as a brief, the teaching and learning module to enhance the preschool children's emotional intelligence is effectively implemented as successfully improving the preschool children's emotional intelligence.

Thus, the teaching and learning module in enhance the preschool children's emotional intelligence is effectively implemented as successfully improving the preschool children's emotional intelligence (EI). In conclusion, the schools who received the teaching and learning EI module can enhance the performance level of preschool children's EI. Meanwhile, the others schools where only used the existing teaching and learning EI curriculum were less successful in helping to raise the level of preschool children's EI for this group.

CONCLUSION

It can be concluded that there are significant differences between the schools in the experimental groups before and after teaching and learning of EI module were conducted. It shows that preschool children's EI risen up from middle level to relatively higher level of EI. Meanwhile, the schools in the control group had no significant difference before and after the existing teaching and learning of EI were conducted. The level of preschool children's EI in this group is remained almost same. Therefore, teaching and learning of EI module was effectively implemented to increase the level of preschool children's EI. It has been said because of on the result, it is to show that the experimental group which used the module was successful in increasing preschool children's EI. At the same time, with the module can help preschool teachers to teach EI to preschool children rather more systematically.

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APPENDIX A

Table 1 Preschool Teachers Perception on Teaching & Learning Module to Enhance Preschool Children's Emotional Intelligence
(n = 100)

Element of Perception On Teaching & Learning Module	Teacher 1	Teacher 2	Conclusion
Time Provided	The time of 30 minute provided for each theme enough to implement all the activity which contained in the module. Even there have an activity which can finish early.	Most of the activity conducted can be finished within 30 minute that provided. However, it proposed that have one or two activities should be finish within 30 minute to 40 minute. So that students have enough time to complete the activity provided such as build character from the 'doh' activity	Based on the reviews from both teachers shows that the time 30 minute provided is suitable to implement all the activity which contained in the module.

<p>Module Length</p>	<p>The module is not too thick. The instruction contained in the module concise and easy to understand. Easy to find specific parts when necessary. This is because the learning materials are arranged in a neat and organized. The information contained herein is concise.</p>	<p>The information contained herein is concise. Description of each activity undertaken concise. Teachers do not need to take a long time to understand the activities to be undertaken. Only a few minutes to read and activities have been implemented. In addition the module content is easy to pass on to students.</p>	<p>Based on the review, showing both preschool teachers are satisfied with the length of the module.</p>
<p>Suitability of Activity</p>	<p>Activities planned and implemented in accordance with the development of pre-school children. Every preschool children have equal opportunities in the experience of the learning process.</p>	<p>Activities can help teachers in the teaching to achieve the specified learning outcomes. There is emphasis on 'learning through play' in the teaching and learning activities performed. There are also activities that provide two options that encourage teachers to modify activities according to the</p>	<p>Based on the reviews, activities are performed in accordance with the level of pre-school children age. In addition, it can be interesting for students to actively engage in the activity given.</p>

		level of student achievement, interests and themes that have been planned.	
User Friendly	To attract students because there are certain images, as well as fun activities.	Activities and images contained within the module interesting and easy to understand preschool children. Apart from that, the activities require teachers and students to cooperate. This can strengthen the relationship of students and teachers as well as to provide an opportunity for teachers to get to know his students closer.	Based on the reviews, the using of the module can be done to facilitate the teaching and learning process is implemented. In addition to interest students, with this module can also strengthen the relationship between teacher and student. This is because the implementation of the activities will not be successful without the collaboration between students and teachers.
Suitability of Module Content Meet to Malaysian National Education Curriculum	Activities that are carried out in the module help in building self development of preschool students. This is in line with the national educational philosophy that	Content modules in line with the national education curriculum. This is because the activity in the modules is achieving the set objectives of the emotional and social aspects.	Based on the reviews, after teaching and learning modules in building emotional intelligence preschool students conducted found that it can help in improving the balance of

	<p>emphasizes the development of individual potential in a holistic and integrated to create a balanced and harmonious human.</p>	<p>For example, students can work alone as well as teamwork. Besides, they can also understand and respect the feelings and rights of others, and this can create a positive relationship between a class.</p>	<p>individual potential intellectually, spiritually, emotionally and physically in order to produce citizens who are knowledgeable, competent, honorable, responsible and capable of achieving well-being.</p>
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NUMERACY AND CHILDREN WITH DOWN SYNDROME

Vicky Tan Ai Lin & Yeo Kee Jiar

ABSTRACT

This conceptual paper is to study the development of number skills and mathematical ability of students with Down syndrome. Pedagogic researchers and educators of children with Down Syndrome have focused mainly on language and reading skills, with lesser attention being given to the numerical and mathematical abilities of this population. Teachers of students with Down syndrome are increasingly concerned with this special population's inadequate performance and demonstration of mathematics skills that has led on students' academic progress in school. The current study explained the importance of improving the existing mathematics instruction techniques for students with Down syndrome in order to meet their unique learning needs.

Keywords: Down syndrome, numeracy, mathematical abilities

INTRODUCTION

Down syndrome was first recognized in 1866 by Dr. John Langdon Down an English physician working in a home for mentally disabled children in Surrey, England (Selikowitz, 1997; Ward, 1999). Dr. Down was the first to describe the characteristic features of the syndrome through one of his patients who was short and had stubby fingers and unusual eyelids (Moeller, 2007). The condition was named after him, however the genetic cause of Down syndrome

was unknown. The 1956 invention of a microscope capable of viewing genetic material allowed Jerome Lejeune and his colleagues in Paris to demonstrate in 1959 that Down syndrome was associated with an extra number of 21 chromosome (Girod, 2001). This led Lejeune to call the condition trisomy 21.

Although autism spectrum disorders are one of the most common developmental disabilities today, affecting an average of 1 in every 110 children (CDC, 2007), Down syndrome is the most common and well known genetic disorder caused by a chromosome abnormality that occurs before birth. The presence of the extra chromosome affects the development of the central nervous system at different levels, leading to variation in the degree of cognitive and other neurological functions among persons with Down syndrome (Wisniewski et al., 1996). This prevalence varies according to the mother's age. Traditionally, women over age 35 have been considered most likely to have babies with Down syndrome.

Typically babies have 46 chromosomes, but those with Down syndrome are born with 47 chromosomes, which causes abnormal changes in the development of the child's body and brain. There are three cytogenetic types of Down syndrome: trisomy 21, translocation, and mosaic. Each is determined by the structure arrangement of the extra chromosome.

Trisomy 21. The most common form of Down syndrome is trisomy 21 (47, XX,+21), which occurs in approximately 92% to 95% of the cases of DS. This type of genetic variation is caused by the presence of an extra chromosome 21 in all cells when a non-disjunction during the meiotic phase occurs. When the disjunction does not occur, a gamete (sperm or egg cell) is produced with an extra copy of chromosome 21; thus, it has 24 chromosomes instead of 23. When combined with a normal gamete from the other parent, the embryo has 47 chromosomes, with three copies of chromosome 21. As the embryo develops, the extra chromosome is represented in every cell. In 88% of cases, the extra copy of chromosome 21 stems from non-disjunction in the maternal gamete, and in 5% of the cases, from non-disjunction in the paternal gamete. Around 4%

to 5% is due to mitotic errors that occur during the cell division after fertilization when the sperm and ovum are joined (Antonarakis, Avramopoulos, Blouin, Talbot, & Schinzel, 1993).

Translocation. The second type of cytogenetic variation in Down syndrome is translocation, which occurs in approximately 4% of cases. Translocation happens when an extra segment of chromosome 21 (as opposed to the whole chromosome) is joined to another chromosome either prior to or at conception (Mikkelsen, 1981; Pennrose, Ellis, & Delhanty, 1960). This attachment occurs most often in chromosome 14, expressed by 45,XX, t(14;21q), chromosome 21 45,XX, t(21q;21q) or in chromosomes 13 or 15.

Mosaic. The third cytogenetic variation is called mosaicism (Clarke, Edwards, & Smallpiece, 1961), which occurs in 1% of Down syndrome cases. In this cytogenetic variant, some cells have an extra 21 chromosome while others do not. The development of children and adults with this type of Down syndrome is closer to the normal range, due to the balancing effect of the normal cells. (Fishler & Koch, 1991; Selikowitz, 1997).

Children with Down syndrome have very distinct characteristics. They are generally small, with a flat face and a tongue that sticks out. They do suffer from learning problems and most are classified as mildly or moderately disabled. Knowledge about Down syndrome has advanced rapidly in many areas, which in turn has resulted in better educational, medical, and family support. However, myths about personality and behaviour traits in persons with Down syndrome are as prevalent today as in the past (Booth, 1985; Gothard 2002; Stores, Stores, Fellows, & Buckley 1998). Many people still incorrectly believe that persons with Down syndrome are always affectionate, have a great sense of humour, and are very sociable (Ripoll 2002).

Studies devoted to analysing the characteristics of people with Down syndrome have noted deficits in the specific processes involving cognitive functions. The difficulties in mathematics experienced by individuals with Down syndrome could arise from three loci (i.e., the two core knowledge systems and the language-

based numerical system) (Camos 2009). Different studies in children and adults with Down syndrome have produced a quite unclear picture of their performance in verbal numerical abilities, and particularly counting. Some studies report underachievement of children with Down syndrome whereas others failed to detect any difference in performance compared to typically developing children. On the one hand, Gelman and Cohen (1988) found that children with Down syndrome (aged between 4 and 7) were less able than mental age matched preschoolers in both counting and cardinality tests. Similarly, Porter (1999) found that children with Down syndrome (aged 7 to 13) were unable to detect errors violating counting principles. Moreover, Nye et al. (2001) found that children with Down syndrome (aged 4 to 7) produced few words and shorter count sequences, and counted smaller arrays of objects than typically developing children matched on nonverbal mental age. However, their understanding of the concept of cardinality was equally well to the matched children, which contrasts with Gelman and Cohen's (1988) findings. On the other hand, Caycho, Gunn, and Siegal (1991) did not find any difference in the use of counting principles between children with DS (mean age: 9;6 years, i.e., 9 years and 6 months) and typically developing children matched on language ability (4;6 years).

Knowledge of learning disabilities and difficulties is essential to propose suitable methodologies to help children with Down syndrome advance in their learning (Herrera et al. 2011).

DOWN SYNDROME AND COGNITIVE FUNCTIONING

Additional genetic material alters the course of development and causes the characteristics associated with the syndrome. At a cognitive level, the syndrome presents with mild to severe mental retardation (IQ range between 40-60), severe problems of inattention and hyperactivity (Carr, 1988; Coe et al., 1999; Clark & Wilson, 2003; Wilding et al., 2002) and uneven abilities across and

within cognitive domains (refer to Table 1). Relative strengths in visuospatial cognition and visuo perceptual integration (Wang & Bellugi, 1994) accompany relative weaknesses in language (Wishart & Duffy, 1990), receptive vocabulary (Cichetti & Ganiban, 1990; Abbeduto et al., 2003), and visuo-constructive skills (Cornish et al., 1999). Memory impairments are also a core feature of Down syndrome with deficits in short-term memory for verbal information and explicit memory compared to short term memory for visuospatial information, suggesting a specific impairment of the phonological loop (Jarrold & Baddeley, 2001; Jarrold, Baddeley & Phillips, 2002; Vicari, 2001).

Table 1 Relative Strengths and Weaknesses in Cognitive Functioning in Down syndrome

	Attention and Inhibition	Language and Vocabulary	Memory	Social Cognition
Strength	- sequential processing of non-verbal information	- non verbal social communication - vocabulary comprehension	- visual spatial short term memory - implicit memory	- visuo- perceptual integration - visuo- spatial cognition
Weaknesses	- attention and concentration - sequential processing for verbal information - auditory information processing	- delayed expressive and receptive language - language fluency - syntax comprehension	- short term memory for verbal information - explicit memory	- Visuo- construction of meaningful designs - visual construction of abstract designs

Nye, Fluck, & Buckley (2001), examined the procedural counting ability (counting sets of toys) and conceptual understanding of cardinality (i.e., the number of elements in a set) in a group of children with Down syndrome (CA = 3.5 to 7 years, MA = 2 to 4 years) and a group of non-verbal mental aged matched typically

developing children (CA = 2 to 4 years, MA = 2 to 4 years). Children were also asked to say the count word sequence aloud, to assess sequence production independent from object counting. It was found that compared to their typically developing counterparts, children with Down syndrome produced significantly less number words overall, shorter standard number sequences, and had less success at counting larger sets of items. Moreover, neither group of children demonstrated an understanding of cardinality. In a follow up study, which charted the development of counting skills in these children, Nye (2003) explored count word production, object counting, and understanding of cardinality at 3 points in time over a one and a half-year period. Results revealed that there were significant differences between the children with Down syndrome and typically developing children on production of count word sequences and word count vocabularies.

Research also suggests that children with Down syndrome may experience particular difficulties with encoding and storing information presented in the auditory channel (Marcell, Harvey, & Cothran, 1988; Marcell & Weeks, 1988; Hulme & Mackenzie, 1992) which may make it difficult to learn new words, including number words (Laws, MacDonald, & Buckley, 1996). Moreover, Buckley and Sacks (1987) used the Vernon's Arithmetic Test to investigate numeracy in children with Down syndrome, aged 11 to 17 years. They reported that 83% (34) were able to successfully complete the test. Of these, 63% could recognize numbers and count, only 23% could add two figures 0-9, and 15% could subtract numbers.

DOWN SYNDROME AND THE DEVELOPMENT OF NUMERICAL COGNITION

Numerical Cognition

Basic numeracy could be defined as being able to count and to calculate with numbers to 100. Understanding basic numeracy will

enhance all aspects of the quality of life and independence of young children with Down syndrome. Most countries have decimal systems for money, measuring and weighing, therefore, knowing numbers to 100 would allow individuals to have a working understanding of these systems. Adding and subtracting are the most useful operations to understand (Buckley 2007). A variety of studies (Nye et al.2001; Bashash, et al. 2003) have shown that counting can support the development of other arithmetical activities.

In general, people with Down syndrome receive, process and organize information slowly and with difficulty. In particular, they mature more slowly although the deficiency is determined by biological characteristics. Children with Down syndrome exhibit difficulties in mathematics compared to typically developing children matched on mental age (Gelman & Cohen, 1988; Porter, 1999; Nye, Fluck, & Buckley, 2001; Turner&Alborz, 2003). They also exhibit impulsiveness when faced with tasks, which leads them to respond without previously analyzing the data. These results in lower quality answers and a higher incidence of errors. The more abstract subjects pose greater difficulties. They tend to struggle when applying learned knowledge and generalizing it to other situations. As a result, mathematics becomes a particularly complex subject.

Children with Down syndrome also suffer from a short attention span (Herrera et al. 2011). They are easily distracted by the simplest things such as a light on the wall or a fly on the desk. Individuals with Down syndrome differ qualitatively and quantitatively in the way they process information, which results in special educational needs. Existing researches indicate that most teenagers and adults do not reach this level of basic competency (Bochner et al. 2002; Carr 2000). One interesting fact is that the numeracy achievements of children with Down syndrome are typically at a lower level than their literacy achievements even when they are receiving good instruction in inclusive classrooms. This results indicate that most youngsters and adults with Down

syndrome do not achieve a basic level of competence (Buckley, 2007). In a recent longitudinal UK study of 24 pupils (ages 6-14 years) with Down syndrome their number skills were, on average, two years behind their literacy skills (Byrne et al 2002; Bird & Buckley 2001; Byrne 2001).

Memory Deficit

Research shows that children with Down syndrome have deficits in working and short-term memory due to a specific deficit in the phonological loop component of Baddeley & Hitch's 1974 model of working memory (Jarrod, Baddeley, & Philips, 2002) and experience particular difficulties with encoding and storing information presented in the auditory channel (Marcell, Harvey, & Cothran, 1988; Marcell & Weeks, 1988; Hulme & Mackenzie, 1992). Jarrod et al. (2002) explored the degree of short-term memory deficits among individuals with Down syndrome and Williams syndrome. Among individuals with Williams syndrome, an impairment in serial recall could be explained in terms of a general slowing in speech rate. In contrast, this could not account for the extent of impairment in individuals with Down syndrome.

Children with Down syndrome also have problems retaining several instructions given in sequential order (sequential memory), which is important in most mathematical activities, and especially in problem comprehension, where several facts or pieces of information must be taken into account. Thus, information should always be presented, whenever possible, in a way that involves more than one sense (Buckley 2007). Their progress will be faster or slower depending on how quickly and which educational approaches are used to intervene in their cognitive development (Herrera et al. 2011).

Inadequate Research In Numeracy

Down syndrome may be the most extensively researched of all developmental disorders, however the majority of research has focused on language and reading skills in this population (Kennedy & Flynn, 2003; Byrne, MacDonald, & Buckley, 2002; Fletcher & Buckley, 2002). There is no doubt that reading and language are necessary components of a child's education, but mathematical competence remains a priority, especially in terms of its fundamental impact on one's ability to lead an independent life. Little is understood about the numeracy abilities of people with Down syndrome (Nye, et al. 1995, 2001, Buckley 2007; Herrera et al. 2011). There is little knowledge about how to help children with Down syndrome improve their mathematics skills and how to address difficulties they encounter because of the lack of studies in this field (Rouse, 2009). This apparent lack of interest is surprising and worrying given the unquestionable influence of mathematical skills for future success in industrialized societies (Geary, 2000). At present, it appears that numeracy is an area of relative difficulty and that progress with more complex mathematical understanding is slow. This remains true despite the fact that the development of number skills is a crucial prerequisite for academic achievement and quality of life as an adult.

Only a small amount of research has been published investigating the number skill development of children with Down syndrome. Within these studies, researchers focused mainly on specific skills such as counting or one to one correspondence (i.e, pairing off members in two sets so that no members remain in either set). Little research has investigated the learning process of children with Down syndrome in other areas of mathematics curriculum such as addition or the other operations (Nye et al. 1999). This lack of research could be due to the assumption that children with Down syndrome can only achieve a certain level of numerical ability (Rouse, 2009).

Children with Down syndrome frequently learn to count by

rote memory but are unable to apply this skill in situation requiring mathematical thinking and problem solving (Gelman and Cohen, 1988). Other contributing factors that could hinder their achievement in mathematics are their difficulties with language skills (Alton, 1988; Lorenz, 1999) and poor auditory memory (Porter, 1999). If instructions are verbally based, children with Down syndrome might forget them or might spend more time processing, trying to remember what they have to do, and thus limiting their ability to complete a mathematical task. Also, if they lack the appropriate mathematical vocabulary or if they lack an understanding of number words, they might not know how to answer mathematics problem (Rouse, 2009).

Teaching method

Some researchers questioned if conventional methods of children's learning of number skills could be aided by alternative approaches since the convention method of teaching mathematics skills seems to be unsuccessful (Rouse, 2009). Scott (1993) evaluated the effectiveness of a multi-sensory, dot notation approach called Touch Math with a small sample of Down syndrome children with mild intellectual disabilities. This system initially instructs students to touch and count numerals from 1 to 9 that contain dots specifically marked at fixed positions. Eventually, the students memories the positions of the dots which are removed from the numbers. Scott was successful with the program and was able to teach participants to use the count-all and count-on strategies when doing addition problems.

Ortega-Tudela and Gomez-Ariza (2006) analyzed whether a computer assisted teaching program facilitates the learning of counting and cardinality concepts in children with Down syndrome. In this study, 17 children with Down syndrome aged 5 to 7 years, were randomly selected to two different teaching groups. One group was taught with a mathematical multimedia software

teaching program while the other one, with a basic pencil and paper teaching method. The results indicated that the group of children trained with the computer assisted program showed a higher performance on a variety of tasks and measures when compared with that of the paper and pencil assisted teaching group. The researchers concluded that traditional teaching methods do not facilitate the development of mathematical learning in children with Down Syndrome.

CONCLUSION

Different studies have shown that students with Down syndrome cannot advance in their mathematical knowledge because they possess poor conceptual understanding and difficulties abstracting, which leads them to apply only memorized procedures. Some teaching approaches that seek to utilize certain relative strengths to communicate number concepts seem to be useful in practice. Further research is needed to define the precise difficulties experienced by children with Down syndrome, to evaluate teaching strategies and also takes into consideration the way in which the students are taught mathematical concepts (Buckley 2007; Herrera et al. 2011).

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PENGETAHUAN TEKNOLOGI PEDAGOGI KANDUNGAN UNTUK PENGINTEGRASIAN ICT YANG OPTIMUM DALAM PENGAJARAN DAN PEMBELAJARAN

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ABSTRAK

Peranan pendidik dan profesion keguruan pada abad ke-21 amat mencabar kerana mempunyai tanggungjawab yang besar bagi melaksanakan dasar meningkatkan pengintegrasian Teknologi Maklumat dan Komunikasi (ICT) dalam pengajaran dan pembelajaran agar seiring dengan perubahan era globalisasi. Pengetahuan Teknologi Pedagogi Kandungan atau Technological Pedagogical Content Knowledge (TPACK) merupakan pengetahuan kompleks yang mengabungkan tiga pengetahuan berasingan iaitu pengetahuan teknologi, pengetahuan pedagogi dan pengetahuan isi kandungan mata pelajaran. Tujuan kertas ini adalah untuk membincangkan tentang cabaran pengintegrasian ICT dalam pengajaran dan pembelajaran, maksud Pengetahuan Teknologi Pedagogi Kandungan, kajian lepas dan cabaran mengukurnya. Pembinaan pengetahuan TPACK dan pengaplikasiannya adalah penting bagi setiap pendidik dalam merealisasikan pengintegrasian ICT yang optimum dalam bilik darjah.

Kata kunci: TPACK, pengintegrasian ICT, Pengetahuan Teknologi Pedagogi Kandungan

PENGENALAN

Perubahan yang pesat dan di luar jangkaan terhadap perkembangan Teknologi Maklumat dan Komunikasi atau lebih dikenali dengan *Information Communication Technology* (ICT) memberi impak yang mendalam kepada peradaban manusia pada zaman ini. Impak tersebut secara langsung membawa transformasi dalam sistem pendidikan negara. Dalam konteks pendidikan, ICT bukan sahaja mampu membantu dalam pengurusan dan pentadbiran, malah berpotensi besar sebagai alat untuk mengayak lagi persekitaran pengajaran dan pembelajaran bagi hampir semua mata pelajaran.

Menurut Morrison dan Lowther (2005) penggunaan ICT dalam pengajaran dan pembelajaran adalah satu kemestian kerana secara tidak langsung dapat menghala dan mengubah paradigma pembelajaran dari pengajaran berpusatkan guru kepada berpusatkan pelajar yang dapat membawa implikasi pelajar tertarik dan berminat untuk belajar. Penggunaan ICT juga dapat membantu guru mempelbagaikan strategi pengajaran yang boleh mendorong pelajar memberi tumpuan serta mengambil bahagian yang menyeluruh dalam proses pembelajaran.

Bagi mencapai matlamat Wawasan 2020 dan mewujudkan masyarakat bermaklumat, maka inisiatif untuk mengintegrasikan penggunaan ICT dalam pengajaran dan pembelajaran adalah perlu (Rusmini, 2009). Penggunaan ICT dalam pengajaran mampu mengubah corak penyampaian ilmu oleh guru supaya lebih bervariasi dan dapat merangsang semua deria bagi menjadikan pembelajaran lebih berkesan. Teknik penyampaian yang berbeza dapat mengembangkan minda pelajar, mencipta daya saing yang sihat dalam pencapaian intelektual, fizikal, emosi dan rohani yang tinggi (Norazah, 2006). Ini membolehkan pengukuhan terhadap sesuatu konsep pengajaran lebih cepat diterima oleh pelajar.

Pengintegrasian ICT secara berkesan dan efisien membolehkan pelajar mencari, menganalisis dan menilai maklumat, melakukan penyelesaian masalah secara kreatif dan efektif (Norainon, 2006).

CABARAN PENGINTEGRASIAN ICT DALAM PENGAJARAN DAN PEMBELAJARAN

Dalam meningkatkan penggunaan ICT dalam pengajaran dan pembelajaran, Kementerian Pelajaran Malaysia telah membelanjakan lebih daripada RM6 bilion untuk teknologi maklumat dan komunikasi (ICT) dalam inisiatif pendidikan. seperti Sekolah Bestari. Jumlah ini merupakan antara pelaburan modal paling intensif pernah dilakukan dalam sistem pendidikan.

Walau bagaimanapun, penggunaan ICT di sekolah masih tidak mencapai tahap yang memuaskan, baik dari segi kualiti mahupun kuantiti. Berdasarkan kajian Kementerian pada tahun 2010 mendapati bahawa lebih kurang 80 peratus guru menggunakan ICT kurang daripada satu jam seminggu. Kajian tersebut turut mendapati bahawa hanya satu per tiga murid menyatakan bahawa guru mereka menggunakan ICT secara tetap. Kajian UNESCO pada tahun 2012 mendapati bahawa penggunaan ICT tidak beranjak daripada sekadar penggunaan aplikasi pemprosesan perkataan sebagai alat pengajaran (Kementerian Pendidikan Malaysia, 2012).

Justeru, peranan guru dalam penggunaan ICT di bilik darjah melibatkan semua peringkat proses pembelajaran, bermula dari persediaan sebelum pengajaran, semasa dan penilaian selepas sesi Pengajaran dan pembelajaran. Kegagalan guru membuat perancangan dalam mengintegrasikan ICT yang teliti akan merugikan pelajar dan menjadikan proses Pengajaran dan pembelajaran kurang berkesan (Rusmini, 2009).

Implikasi dari Kegagalan Mengintegrasikan ICT

Mengintegrasikan ICT dalam pengajaran dan pembelajaran secara berkesan merupakan suatu cabaran kepada guru (Shafer, 2008; So dan Kim, 2009). Banyak kajian yang menunjukkan bahawa guru kurang mengintegrasikan ICT dalam bilik darjah dengan berkesan (Fishman dan Davis, 2006; Mueller et al., 2008; Palak dan Walls', 2009; Ertmer dan Otthenbreit-Leftwich, 2010).

Ertmer dan Otthenbreit-Leftwich (2010) menyatakan kebimbangan mengenai data yang konsisten menunjukkan bahawa pengintegrasian ICT yang berkesan serta dapat membantu pembelajaran berpusatkan pelajar tidak berlaku di sekolah. Guru hanya sekali sekala dan kurang optimum menggunakan ICT di bilik (Ertmer dan Otthenbreit-Leftwich, 2010). Guru juga kurang menggunakan ICT di dalam bilik darjah dan hanya menggunakan ICT untuk mendapatkan dan penghantaran maklumat sahaja dan tidak menggunakan ICT untuk membina pengetahuan pelajar (Gao et al., 2009; Harris, Mishra dan Koehler, 2009; Otthenbreit-Leftwich et al., 2010; Sang et al., 2010).

Pengintegrasian ICT dalam Pengajaran dan pembelajaran memerlukan kemahiran dan komitmen dari guru secara tekal dan berfokus. Oleh yang demikian guru perlu bersedia dan berkeyakinan untuk melakukan perubahan dalam penggunaan kaedah pengajaran ke arah pengintegrasian ICT yang dapat memberikan nilai tambah kepada aktiviti pengajaran.

Penyumbang Terhadap Kegagalan Mengintegrasikan ICT

Banyak faktor penyebab terhadap kegagalan pengintegrasian ICT dalam pengajaran dan pembelajaran. Antara faktor yang menyebabkan guru tidak mempunyai keyakinan untuk mengintegrasikan ICT dalam pengajaran dan pembelajaran adalah berpunca dari kurangnya latihan yang berkaitan dengan cara mengintegrasikan ICT dengan berkesan. Keadaan ini menyebabkan

para guru kurang pengetahuan, kemahiran, kebolehan dan kecekapan yang berkaitan dengan cara mengintegrasikan ICT dalam proses pengajaran dan pembelajaran mereka (Bingimlas, 2009; Oncu et al, 2008; Hew dan Brush, 2007). Oleh yang demikian, institusi latihan pendidikan memainkan peranan penting dalam memberi pendedahan dan latihan yang sewajarnya kepada para bakal guru mengenai ilmu pengetahuan serta kemahiran cara mengintegrasikan ICT dalam bilik darjah dengan berkesan sebelum bakal guru ini keluar mengajar di sekolah.

Menurut Mishra dan Koehler (2006) tiada satu garis panduan yang kukuh bagaimana hendak mengendalikan program untuk menyediakan guru yang berkemampuan mengintegrasikan teknologi dalam pengajaran dan pembelajaran dengan berkesan apabila mereka ke sekolah kelak. Ekoran itu, Mishra dan Koehler telah memulakan program penyelidikan yang sistematik dalam usaha untuk mengenal pasti kekurangan kerangka teori untuk membimbing guru pra-perkhidmatan mengintegrasikan teknologi dalam pengajaran dan pembelajaran. Tujuannya adalah untuk memperkembangkan teori dan model-model untuk penyelidikan yang menyeluruh dalam bidang pendidikan guru mengenai kaedah pengintegrasian teknologi (Mishra dan Koehler, 2006; Angeli, 2008) dan ianya telah menghasilkan suatu kerangka teori yang dipanggil Pengetahuan Teknologi Pedagogi Kandungan atau Technological Pedagogical Content Knowledge (TPACK) yang memberi perhatian kepada merancang dan mengajar secara efektif menggunakan teknologi (Mishra dan Koehler, 2006; Niess, 2005)

PENGETAHUAN TEKNOLOGI PEDAGOGI KANDUNGAN (TPACK)

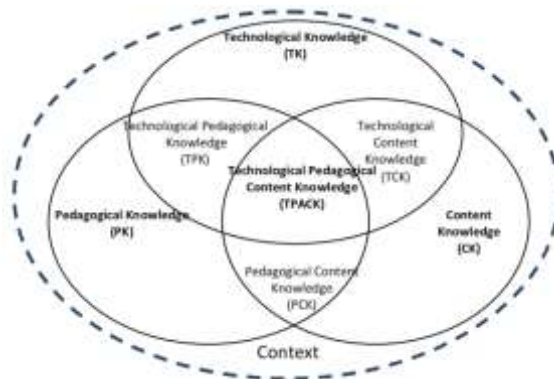
TPACK telah dibangunkan melalui beberapa siri reka bentuk eksperimen (Koehler dan Mishra, 2005,2007; Koehler, Mishra, Hershey, dan Peruski, 2004; Koehler, Mishra, dan Yahya, 2007; Mishra, Peruski, dan Koehler, 2007) yang menerangkan tindakan

atau persilangan di antara pengetahuan tentang isi kandungan sesuatu mata pelajaran (Content Knowledge-CK), pengetahuan mengenai pedagogi semasa pengajaran dan pembelajaran (Pedagogical Knowledge-PK) dan pengetahuan menggunakan teknologi (Technological Knowledge-TK) sebagai satu pengetahuan yang diperlukan bagi guru untuk mengintegrasikan teknologi ke dalam pengajaran dan pembelajaran dengan cara yang bermakna.

Gabungan teknologi dalam pedagogi sesuatu mata pelajaran mesti mengambil kira kombinasi dinamik antara komponen-komponen dan tindakan antara komponen-komponen tersebut. Guru yang boleh mengendalikan hubungan antara komponen-komponen ini dianggap pakar yang berbeza daripada seorang pakar dalam suatu bidang disiplin ilmu mahupun dalam bidang pengetahuan teknologi atau dalam bidang pengetahuan pedagogi sahaja (Mishra dan Koehler 2006; 2009)

Penginterasian ICT melalui TPACK

Menurut Koehler dan Mishra (2006) mengajar dengan teknologi dilihat sebagai suatu masalah yang rumit untuk diselesaikan kerana pelbagai sebab seperti perubahan pesat perkembangan teknologi yang perlu diikuti oleh guru, masalah yang dihadapi adalah unik bagi setiap sekolah, penyelesaian yang sukar direalisasikan, tiada penyelesaian yang betul atau yang salah, tiada peraturan yang tetap dan sentiasa dinamik untuk sesuatu penyelesaian. Oleh yang demikian adalah perlunya suatu cara yang baru untuk menghadapi kerumitan tersebut dengan menggunakan kerangka kerja TPACK seperti yang ditunjukkan pada Rajah 1.



Rajah 1 : Pengetahuan TPACK (Koehler dan Mishra, 2006)

Penemuan lama dengan pendekatan baru yang diperkenalkan oleh Koehler dan Mishra (2006) yang dinamakan rangka kerja TPACK telah dapat menerangkan dengan jelas peranan teknologi atau ICT dapat diintegrasikan dalam proses pengajaran dan pembelajaran dengan cara yang benar-benar bersepadu (Abbitt, 2011a).

Rangka kerja TPACK telah berkembang begitu pesat. Banyak usaha penyelidikan sedang dijalankan yang memberi tumpuan kepada membangunkan TPACK dan bagaimana mengukur pengetahuan TPACK guru pra-perkhidmatan (Abbitt, 2011a). Penggunaan kerangka kerja TPACK telah digunakan dalam kajian penyelidikan dan penilaian di peringkat sekolah dan di pendidikan tinggi.

Contoh kajian yang telah menggunakan kerangka kerja TPACK ialah Penyiasatan Penggunaan World Wide Web (Lee dan Tsai, 2010), Pengajaran dan pembelajaran dalam talian (Archambault dan Crippen, 2009; Doering et al., 2009), Pembangunan amalan komuniti (Engelien et al., 2009; Sun dan Deng, 2007), dan Penggunaan video digital dalam bilik darjah K-12 (Hofer dan Swan, 2008). Rangka kerja TPACK juga telah digunakan untuk merangkakan konstruk lain terhadap konstruk kepercayaan yang mempengaruhi integrasi teknologi, seperti efikasi

kendiri dan keyakinan (Albion et al., 2010; Graham et al., 2009).

Justeru itu, Institusi pendidikan melalui latihan persediaan guru pra-perkhidmatan sepatutnya bersedia membangunkan pengetahuan TPACK agar dapat melahirkan bakal guru yang dapat menjadi agen perubahan kepada sistem pendidikan yang bertaraf dunia sekali gus menjadi pendidik yang bakal melahirkan generasi yang dicita-citakan dalam falsafah pendidikan negara.

KAJIAN LEPAS TENTANG TPACK

Kajian yang berkaitan dengan rangka kerja TPACK bukan suatu kajian yang baru. Sebelum rangka kerja TPACK diperkenalkan, kajian yang berkaitan keperluan untuk menggabungkan ke tiga-tiga elemen kandungan, pedagogi dan teknologi telah dikaji oleh penyelidik-penyelidik terdahulu. Contohnya kajian yang dilaksanakan oleh Keating dan Evans (2001) telah menggunakan metodologi "*grounded theory*" untuk meneliti temu bual dan data kaji selidik dari sekumpulan kecil guru-guru pra-perkhidmatan bagi mendapatkan pendapat mereka bagaimana mengajar dengan teknologi sesuai dengan perkembangan pengetahuan pedagogi kandungan (PCK) pelajar mereka. Kajian tersebut menunjukkan bahawa pelajar selesa menggunakan teknologi bagi pelbagai tujuan dalam kehidupan seharian mereka. Kegunaan teknologi secara peribadi ini, bagaimanapun, sukar diterjemahkan kepada maksud integrasi teknologi dalam pengajaran dan pembelajaran, sekali gus menunjukkan bahawa pengetahuan teknologi yang digunakan secara peribadi ini tidak mencukupi untuk memupuk integrasi teknologi dengan jayanya (Keating dan Evans, 2001).

Kajian oleh Niess (2005) juga mengkaji mengenai perkaitan antara pengetahuan teknologi, pedagogi dan kandungan dalam kalangan guru pra-perkhidmatan yang akan menjadi guru sains dan matematik. Niess mendapati hanya beberapa orang bakal guru ini hanya memahami saling interaksi antara teknologi dan mata pelajaran sains walaupun penekanan terhadapnya telah diberikan

sepanjang program.

Graham, Burgoyne, and Borup (2010) telah membuat kajian mengenai proses membuat keputusan oleh guru pra perkhidmatan semasa mereka melaksanakan perancangan untuk mengintegrasikan teknologi dalam pengajaran dan pembelajaran. Keputusan kajian mendapati bahawa contoh strategi pembelajaran yang berdasarkan TK semakin menurun manakala strategi pengajaran yang berdasarkan pelbagai aspek TPK meningkat. Pelajar secara amnya semakin dapat memberikan alasan yang lebih kompleks dalam menggunakan teknologi dalam strategi pengajaran yang dirancang.

Harris *et al.* (2010) juga memberi fokus kepada pemeriksaan hasil kerja pelajar sebagai bukti pembangunan TPACK dan berusaha membina satu ukuran yang boleh digunakan untuk membuat triangulasi pengetahuan TPACK pelajar dengan pengukuran tambahan. Dalam mencapai matlamat ini Harris *et al.* (2010) menerangkan proses dan keputusan terhadap pembinaan rubrik untuk mencapai TPACK menggunakan perancangan mengajar yang telah dirancang oleh pelajar. Bagaimana pun sehingga setakat ini, rubrik tersebut belum pernah diuji dengan perancangan mengajar oleh pendidik yang berpengalaman dan beliau mencadangkan rubrik tersebut adalah sesuai digunakan untuk perancangan pengajaran yang dibuat oleh guru pra-perkhidmatan.

CABARAN MENGUKUR TPACK

Sifat dinamik teknologi dan kepelbagaian situasi dalam pendidikan guru pra-perkhidmatan telah membawa penyelidik lepas menggunakan pendekatan yang berbeza untuk menentukan konteks di mana pengetahuan TPACK dapat diukur. Keadaan ini menyumbang kepada cabaran-cabaran yang tidak unik kepada setiap penyelidikan TPACK. Cabaran-cabaran yang berterusan ini telah mempengaruhi instrumen pengukuran TPACK. Pelbagai usaha dilaksanakan untuk mencari keseimbangan yang sesuai antara fokus pada persekitaran pembelajaran yang spesifik dan relevan kepada

skop yang lebih luas dalam aspek program penyediaan guru yang dikaitkan dengan kerangka kerja TPACK (Arbitt, 2011b).

Sepanjang usaha untuk menentukan dan mengukur pelbagai domain pengetahuan TPACK, terdapat dua cara utama yang digunakan oleh penyelidik lepas iaitu menggunakan kaedah laporan sendiri (*Self-Reporting*) yang kebiasanya menggunakan soal selidik. Manakala kaedah yang kedua adalah pengukuran yang berasaskan prestasi (*Performance-Based*). Pada kebiasaan instrumen berasaskan prestasi yang digunakan oleh penyelidik lepas adalah seperti perancangan pengajaran dan penghasilan artifak. Kedua-dua kaedah ini pula mempunyai kelainan dan kepelbagaian instrumen yang digunakan bergantung kepada jenis teknologi yang dirujuk dan konteks serta skop penyediaan guru pra-perkhidmatan yang dikaji. Bagaimana pun kedua-dua kaedah ini mempunyai kekuatan dan kelemahan masing-masing (Arbitt, 2011b).

Cabaran dalam pengukuran pengetahuan TPACK yang kompleks dengan pelbagai kaedah dan instrumen yang berbeza membuka ruang yang luas kepada penyelidik akan datang untuk menemukan kaedah pengukuran TPACK yang lebih mantap dan stabil.

KESIMPULAN

Kajian literatur yang berkaitan tentang pembinaan pengetahuan TPACK dalam kalangan guru pra perkhidmatan agak sukar ditemui panduan khusus atau berberapa set amalan yang perlu diikuti oleh para pendidik untuk memperolehi pengetahuan ini dengan mudah. Bagaimana pun pemilihan pedagogi yang berkesan adalah tunjang kepada pembangunan TPACK seseorang guru. Oleh yang demikian, suatu pedagogi pendekatan pembelajaran berasaskan inkuiri telah digunakan dalam kursus Teknologi dalam Pengajaran dan Pembelajaran untuk membangunkan tahap TPACK guru pra-perkhidmatan. Beberapa pengubahsuaian dilakukan terhadap pengajaran secara tradisional kursus tersebut bagi membangunkan

tahap TPACK guru pra-perkhidmatan sekali gus meningkatkan keyakinan atau efikasi sendiri mengintegrasikan ICT dalam pengajaran dan pembelajaran. Diharapkan persekitaran pembelajaran berasaskan inkuiri dalam talian ini bukan sekadar dapat meningkatkan penggunaan ICT semata-mata semasa menjalani latihan mengajar tetapi juga dapat mengintegrasikan dengan ICT dengan cara yang betul dan yakin semasa mereka menjadi guru kelak.

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PENGUTARAAN MASALAH MATEMATIK BERFOKUSKAN METAKOGNITIF DALAM KALANGAN PELAJAR SEKOLAH MENENGAH DAERAH TANJUNGPINANG INDONESIA

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ABSTRAK

Keupayaan pelajar untuk membuat masalah matematik mereka sendiri menunjukkan suatu kuasa keinginan untuk meningkatkan tahap pemahaman mereka mengenai bagaimana persepsi mereka terhadap matematik dalam situasi kehidupan sebenar. Oleh itu, baru-baru ini, satu pembaharuan dalam pendidikan matematik telah menyeru supaya memberikan penekanan yang lebih kepada pengutaraan masalah. Meskipun minat ini dalam mengintegrasikan pengutaraan masalah matematik ke dalam amalan bilik darjah namun sedikit yang telah diketahui tentang proses kognitif dan metakognitif yang terlibat apabila pelajar menjana masalah mereka sendiri. Oleh itu, kajian ini bertujuan untuk menelusuri dan memahami proses pengutaraan masalah matematik dan kewujudan metakognitif dalam kalangan pelajar sekolah menengah. Kajian ini menggunakan reka bentuk kajian kes kualitatif. Teknik pengumpulan data menggunakan tugas pelajar, pemikiran bersuara, temu bual separa berstruktur retrospektif dan pemerhatian. Responden dipilih dengan menggunakan kaedah persampelan bertujuan. Seramai tiga pelajar sekolah menengah gred

11 IPA2 mengambil bahagian dalam sesi pemikiran bersuara dan temu bual. Data temu bual dan pemikiran bersuara dianalisis menggunakan teknik analisis tematik dan analisis perbandingan malar. Kajian mendapati, dalam fasa membaca, memahami, dan analisis, pelajar telah terlibat dalam pemantauan tingkah laku seperti membuat pemahaman mendalam, menerangkan maklumat yang penting, mengingat topik sebelumnya, dan membaca semula maklumat tertentu. Semasa merancang, meneroka, pelaksanaan, dan fasa pengesahan, pelajar membuat keputusan untuk mempertimbangkan pengetahuan dan strategi, memantau kemajuan, dan menilai produktiviti aktiviti dan kesesuaian pernyataan masalah baru. Akhirnya, kajian ini menyumbangkan gagasan dan arah tuju kepada guru dan penentu polisi untuk mengenal pasti dan mengekalkan tugas yang dapat merangsang minda pelajar menerusi aktiviti pengutaraan masalah dan membangunkan tingkah laku metakognitif.

Kata kunci: Metakognitif; proses pengutaraan masalah; pelajar sekolah menengah

1.0 PENGENALAN

Dalam Kurikulum Tingkat Satuan Pendidikan (KTSP) di Indonesia telah menyatakan dengan tegas bahawa tujuan pembelajaran matematik adalah terbentuknya kemampuan berhujah pada pelajar yang direfleksikan melalui kemampuan berfikir kritis, logik, dan sistematik. Bagi mencapai tujuan ini pemerintah Indonesia telah melakukan beberapa upaya, diantaranya penambahbaikan kurikulum dan latihan bagi guru. Namun begitu, pencapaian pelajar tetap sahaja rendah khususnya pada pengajian matematik (Saito, *et al.*, 2007). Rendahnya kualiti pendidikan dilihat dari sisi proses, adalah adanya anggapan bahawa selama ini proses pendidikan di Indonesia yang di jalankan oleh guru dianggap bertumpu pada pembangunan aspek kognitif peringkat rendah, yang tidak

membangunkan kreativiti berfikir. Proses pendidikan atau proses pengajaran dan pembelajaran dianggap selalu menempatkan pelajar sebagai objek yang harus diisi dengan pelbagai maklumat dan bahan-bahan hafalan. Komunikasi terjadi satu arah, iaitu guru ke pelajar melalui pendekatan ekspositori yang dijadikan sebagai kaedah utama dalam proses P&P (Widjaja, 2011). Beberapa kajian lain juga telah mendapati bahawa pengajaran matematik di Indonesia masih menggunakan kaedah tradisional (Mullis et al.; 2012; Yusminah, 2009). dan akibatnya, pelajar kurang aktif dalam proses pengajaran dan pembelajaran kerana pendekatan yang berpusatkan pada guru. Selain itu pula, kerap guru hanya mengikut buku teks dan pelajar dilatih untuk memberi maklum balas dalam bentuk yang diharapkan oleh guru, dan ini adalah punca kegagalan pelajar (Semadeni, 1986). Penekanan kepada penyelesaian masalah di dalam kelas matematik telah berterusan (Cai *et al.*, 2013). Pelajar telah belajar untuk memberi tumpuan kepada hasil daripada usaha menyelesaikan masalah dan selalunya mempunyai peluang yang sedikit untuk terlibat dalam proses perumusan masalah (Ellerton, 2013). Jika pelajar hanya melakukan prosedur pengiraan atau latihan di dalam kelas matematik, mereka akan percaya bahawa matematik hanya satu set prosedur (Stickless, 2006). Hasil dari ini semua telah membawa pencapaian matematik pelajar Indonesia berada dalam kumpulan terendah di dunia (Mullis et al.; 2012).

Padahal, Einstein & Infeld, (1938) telah lama mengiktirafkan bahawa pengutaraan masalah merupakan aktiviti intelek sebagai sesuatu yang amat penting dalam penyiasatan saintifik. Penyertaan aktiviti pengutaraan masalah dalam kurikulum dapat memupuk pemikiran yang pelbagai dan fleksibel, meningkatkan kemahiran penyelesaian masalah pelajar, memperluas pandangan matematik dan memperkayakan dan memperkukuhkan konsep asas pelajar (Brown & Walter, 1993). Ini telah dipertegas oleh Cai *et al.* (2013), yang menyatakan bahawa dengan menyediakan pelajar peluang untuk mengutarakan masalah mereka sendiri, tidak hanya berkemungkinan untuk memupuk kefahaman pelajar mengenai situasi masalah, tetapi juga untuk memupuk strategi pembangunan

penyelesaian masalah yang lebih maju. Cankoy (2014) menambahkan pula bahawa dapatan kajian mengenai sifat soalan yang merupakan suatu 'masalah' adalah sangat penting kerana banyak kajian menunjukkan bahawa apabila mencadangkan satu masalah untuk diselesaikan, pengutara masalah biasanya akan menyiasat jenis proses yang diperlukan untuk menyelesaikan masalah (seperti. Brown & Walter, 2005; Kilpatrick, 1987; Abu Elwan, 1999; Cai *et al.*, 2013). Seterusnya, Kilpatrick (1987) juga telah menyediakan hujah teori bahawa kualiti pernyataan masalah yang diutarakan oleh pelajar boleh menjadi suatu indeks mengenai seberapa baik mereka boleh menyelesaikan masalah.

Kajian mengenai pengutaraan masalah masih belum menjadi tumpuan utama dalam aliran penyelidikan pendidikan matematik (Singer, Ellerton, & Cai, 2013). Tambahan pula, masih kurangnya kerja yang dilakukan pada isu kognitif dan metakognitif mengenai pengutaraan masalah matematik itu sendiri (Chua & Yeap, 2009). Padahal, menurut Tosun dan Senocak (2013), apabila individu menghadapi masalah baru, strategi metakognitif memainkan peranan penting supaya mereka boleh sampai pada hasil yang berjaya. Dengan menggunakan metakognitif pula, individu boleh menilai jika mereka akan berjaya atau tidak, kemudian membuat keputusan mengenai langkah-langkah yang patut diambil untuk menyelesaikan tugas, melihat bagaimana proses meneruskan, dan memindahkan pengalaman mereka ke proses seterusnya (Gourgey, 1998). Beberapa pengkaji telah menunjukkan bahawa aplikasi strategi metakognitif adalah sangat penting bagi proses pembelajaran (Zhang, 2008; Aydin, 2011). Everson dan Tobias (2001) dan Matanzo dan Harris (1999) menyatakan ramai pelajar yang memasuki kolej tidak diajarkan strategi untuk menyemak atau meningkatkan metakognisi mereka. Oleh itu, kajian yang lebih empirikal diperlukan untuk menunjukkan apa-apa kesan sebenar (Cai *et al.*, 2013).

Berdasarkan maklumat di atas, tujuan daripada kajian ini adalah untuk menjawab pertanyaan: 1) Bagaimana proses pengutaraan masalah dalam kalangan pelajar?, dan 2) Apakah

proses metakognitif yang wujud semasa aktiviti pengutaraan masalah?”. Lebih spesifik lagi kajian ini mempunyai objektif untuk mengenalpasti proses pengutaraan masalah dan kewujudan metakognitif pada proses tersebut. Untuk mengenalpasti persoalan kajian ini maka pengkaji telah menggunakan gabungan kerangka kerja kognitif–metakognitif daripada Art-Armour Thomas (1992) dan Schoenfeld (1985). Manakala bagi menentukan metakognitif, pengkaji menggunakan kerangka kerja Garofalo & Lester (1985).

Oleh itu, dengan kajian kes, dan beberapa kaedah seperti temubual, pemikiran bersuara dan kertas jawapan pelajar pengkaji bermaksud mendapatkan gambaran yang lengkap mengenai bagaimana proses yang dijalankan pelajar dalam mengutarakan masalah dan proses metakognitif apa yang wujud semasa itu. Dapatan kajian ini diharapkan akan menjadi rujukan bagi calon guru, guru matematik, pensyarah, pengkaji bidang matematik dan penggubal kurikulum untuk melibatkan aktiviti pengutaraan masalah kepada pelajar dan merangsang pelajar supaya selalu mencungkil kemahiran metakognitifnya dalam setiap aktiviti pengajaran dan pembelajaran matematik. Bahagian seterusnya dari kertas kerja ini akan membincangkan mengenai: pertama, deskripsi mengenai kaedah kajian dan prosedur dan analisis data, keputusan kajian dan analisis data juga akan dibincangkan. Seterusnya, perbincangan dapatan kajian dan kesimpulan. Terakhir sekali pengkaji mengarahkan cadangan untuk kajian seterusnya.

2.0 TINJAUAN LITERATUR

2.1 *Kemahiran Pengutaraan Masalah*

Pengkaji dan pendidik telah menyokong bahawa pengutaraan masalah digunakan untuk membangunkan pengetahuan matematik, kemahiran, dan pemahaman pelajar. Misalnya, English (2003) menyatakan bahawa pengutaraan masalah menghubungkan pelajar

dengan matematik yang penting. Selain itu, pengutaraan masalah dapat menggalakkan pemahaman yang mendalam tentang matematik (Brown & Walter, 2005; English, 2003). Seterusnya, Stoyanova (2003) menyatakan bahawa pengutaraan masalah dalam topik tertentu membantu pelajar untuk menstrukturkan pengetahuan mereka dalam bidang tertentu. Di samping itu, menurut Stoyanova, guru telah menggunakan pengutaraan masalah untuk menilai pemahaman matematik dan untuk mengesan kesukaran dan salah faham pelajar.

Penyelesaian masalah adalah salah satu kaedah yang sering digunakan dalam peperiksaan untuk menjelaskan topik atau untuk menentukan kejayaan pelajar (Çildir & Sezen, 2011). Mereka juga menyatakan bahawa pengutaraan masalah adalah satu proses menyeluruh yang merangkumi penyelesaian masalah. Banyak kajian telah membuktikan bahawa pengutaraan masalah adalah seperti menyelesaikan masalah merupakan faktor-faktor yang dapat mempengaruhi kejayaan (Demir, 2005). Kedua-dua konsep ini berkait rapat. Dalam literatur kajian, pengutaraan masalah sering dikaitkan dengan kejayaan dan pemikiran matematik (Çildir & Sezen, 2011). Nicolaou dan Philippou (2004) menekankan bahawa terdapat hubungan yang kuat antara pengutaraan masalah dan kejayaan matematik, dan mereka menunjukkan bahawa terdapat perbezaan yang dramatik antara pelajar gred 5 dan gred 6 dari segi kemahiran mereka mengutarakan masalah.

Pengutaraan masalah dan penyelesaian masalah berkait rapat kerana dalam menyelesaikan masalah pelajar berhadapan dengan keadaan yang kompleks atau peristiwa, atau pelajar merasakan tanggungjawab terhadap keadaan atau peristiwa, manakala mereka yang tidak mempunyai kemahiran menyelesaikan masalah akan menghadapi kesukaran dalam mengutarakan masalah (Korkmaz & Gur, 2006) kerana pengutaraan masalah membolehkan mereka untuk memahami situasi matematik, untuk mentafsir konsep yang diberikan dalam masalah, dan untuk memahami simbol. Akay dan Boz (2008) telah mengkaji kesan menggunakan soalan pendek dan terbuka serta pendekatan pengutaraan masalah dalam memahami

konsep matematik dan pembelajaran, dan mereka membuat kesimpulan bahawa kemahiran pengutaraan masalah memberi pelajar keupayaan untuk menyatakan situasi matematik secara lisan dan bertulis, dan mengajar mereka membuat penaakulan matematik dengan betul.

Aspek penulisan pengutaraan masalah memaksimumkan pembelajaran kerana ia memaksa pelajar untuk menjana idea, berinteraksi dengan kognitif pelajar, melibatkan renungan, analisis dan sintesis. Penulisan masalah meningkatkan kemahiran kognitif dan komunikasi pelajar, dan menjelaskan kefahaman mereka terhadap proses matematik dan menyediakan peluang merentasi kurikulum. Apabila pelajar menulis masalah mereka sendiri, mereka menggunakan idea mereka sendiri, memberi mereka masa untuk berfikir dan sekaligus meningkatkan kefahaman dan pengetahuan secara konsisten (Cappo & Osterman, 1991).

Berdasarkan Dickerson (1999) pengutaraan masalah menggalakkan pelajar untuk menggunakan matematik untuk memberi makna tentang dunia mereka dan membina hubungan antara pengetahuan sebelumnya dan baru melalui pengalaman peribadi yang bermakna. Beliau mendapati bahawa pengajaran pengutaraan masalah muncul untuk menjadi satu pendekatan yang berkesan untuk meningkatkan kejayaan pencapaian menyelesaikan masalah. Beliau mendakwa bahawa pengutaraan masalah menawarkan strategi yang lebih baik tentang pengajaran dalam memenuhi matlamat NCTM untuk membuat penaakulan, komunikasi, dan matematik lanjutan.

Stoyanova (1998) menyatakan bahawa mengutarakan masalah dalam topik tertentu membantu pelajar untuk menstrukturkan pengetahuan mereka dalam bidang tertentu. Di samping itu, guru boleh menggunakan pengutaraan masalah untuk menilai pemahaman matematik dan untuk mengesan kesukaran dan salah faham pelajar (Lin, 2004). Tambahan pula, pengutaraan masalah boleh mengembangkan kemahiran berfikir tahap tinggi pelajar (Barlow & Cates, 2006).

Beberapa kajian telah menyiasat tentang kesan pengajaran

pengayaan pengutaraan masalah terhadap pengetahuan dan kefahaman atau pencapaian matematik. Misalnya, laporan kajian Akay dan Boz (2008) menunjukkan bahawa pencapaian matematik guru sekolah rendah pra perkhidmatan yang telah mempelajari Kalkulus melalui perbincangan dan aktiviti pengutaraan masalah dan penyelesaian masalah mendapati bahawa pelajar dari kelas eksperimen mempunyai prestasi yang lebih tinggi daripada pelajar dari kelas kawalan iaitu kelas yang mengikuti kuliah tentang aktiviti pengutaraan masalah dan penyelesaian masalah secara terbuka. Tambahan lagi, Toluk-Ucar (2009) menyiasat impak pengutaraan masalah terhadap guru sekolah rendah pra perkhidmatan berhubung dengan pemahaman mereka tentang pecahan. Semasa pra ujian, semua guru pra perkhidmatan mempunyai pengetahuan prosedural, tetapi mereka kekurangan pemahaman konsep. Kemudian, dalam ujian pos mereka didapati mempunyai pemahaman yang lebih baik untuk mengutarakan masalah tentang pecahan dan dapat menerangkan hujah dan mengutarakan masalah berayat tentang pecahan.

Lavy dan Shriki (2010) juga telah melibatkan guru pra perkhidmatan matematik sekolah menengah rendah dan menengah atas dalam pengutaraan masalah *what if not* strategi dan penjelajahan menggunakan perisian geometri dinamik. Analisis portfolio mingguan menunjukkan bahawa guru pra perkhidmatan dapat meningkatkan pengetahuan mereka dalam matematik dan meta-matematik. Mereka dapat mendalami pengetahuan dan pemahaman tentang konsep geometri dan bentuk dan mengaitkan kedua-dua idea tersebut. Misalnya, guru pra perkhidmatan dapat meningkatkan pemahaman mereka tentang perkara-perkara seperti pengertian kepastian, hubungan, definisi, dan kesahihan hujah.

2.2 *Keentingan Metakognitif*

Metakognitif juga dianggap sebagai bahagian penting tentang keupayaan manusia (Rahman, 2011). Pertama, jika pelajar tidak

sedar tentang kefahaman yang perlu wujud dan apa yang perlu mereka lakukan, maka strategi guru akan gagal. Kedua, pelajar tanpa pendekatan metakognitif kebiasaannya merupakan pelajar yang tidak mempunyai arah untuk mengulangkaji kemajuan, pencapaian dan arah masa depan mereka (O'Malley *et al.*, 1985).

Metakognitif juga selalu diiktiraf sebagai sesuatu yang sangat penting, tetapi pemahaman yang lebih baik bagaimana metakognitif dibangunkan dan peranan yang dimainkan dalam pemahaman matematik adalah sangat perlu (Wilson & Clarke, 2002). Costa (1984) mengenal pasti metakognitif sebagai penunjuk intelek pendidikan, oleh itu, pengajaran metakognitif perlu untuk melangkaui penyelesaian masalah dan menjadi sebahagian pengajaran matematik umum (Garofalo & Lester, 1985). Domain metakognitif adalah pelbagai dan telah diiktiraf sebagai bukan sahaja penting untuk pembelajaran pelajar, tetapi juga cenderung untuk menjadi tidak konsisten dan kekurangan kesepaduan (Veenman *et al.*, 2006).

Pemikiran metakognitif mesti jelas diajar dan diiktiraf dalam domain kandungan yang tertentu, seperti dalam kandungan matematik (Desoete, 2007; Lin, 2001). Pengajaran pemikiran metakognitif perlu bersepadu dan tertanam dalam pengajaran matematik dan bukannya dilihat sebagai kandungan yang berasingan dan tambahan yang perlu ditambah kepada kurikulum yang sudah lengkap.

Lin (1994) berhujah bahawa fungsi metakognitif dalaman pelajar menyediakan kunci kepada pembelajaran yang berjaya di bawah situasi kawalan pelajar. Ketidakupayaan untuk menyediakan tinjauan, refleksi, penilaian dan pelarasan pembelajaran yang tepat menghalang pembelajaran dan merupakan rujukan kepada kemahiran metakognitif pelajar yang rendah.

Beberapa kajian juga telah menunjukkan kepentingan metakognitif terhadap pencapaian akademik dalam bidang psikologi pendidikan. Misalnya, pelajar yang mempunyai pengetahuan metakognitif 1) berupaya untuk melaras kognitif dan pemikiran mereka sendiri agar lebih adaptif apabila menyelesaikan masalah, 2)

lebih berupaya untuk memindahkan strategi pengetahuan kepada situasi pembelajaran yang baru, dan 3) belajar dan berjaya dalam bilik darjah (Pintrich, 2002). Begitu juga, pelajar yang mengawalselia pembelajaran dan proses penyelesaian masalahnya menunjukkan pencapaian matematik yang tinggi (misalnya, markah ujian pencapaian matematik yang tinggi) (Zimmerman, 1990) dan tahap pencapaian matematik yang tinggi (Gaskill & Hoy, 2002).

Metakognitif adalah penting dan perlu bagi setiap pelajar matematik tanpa mengira peringkat umur (Martinez, 2006). Proses metakognitif boleh meningkatkan pembelajaran dengan membimbing pemikiran pelajar, dan membantu pelajar untuk mengikuti strategi yang jelas kerana mereka berfikir melalui masalah, membuat keputusan, atau cuba untuk memahami teks (Rahman, 2011). Selain itu, metakognitif mempunyai korelasi dengan aspek-aspek lain yang dipercayai memberi kesan kepada kejayaan pelajar seperti motivasi (Crawford, 2007), kebimbangan (Kramarski *et al.*, 2010), dan intelek (van der Stel & Veenman, 2008) serta menyumbang kepada kejayaan penyelesaian masalah jika dibandingkan dengan kecerdasan intelek (Swanson, 1990). Secara keseluruhannya, pelajar dengan kesedaran metakognitif mempunyai keupayaan untuk memahami bagaimana, bila, dan kenapa untuk menggunakan strategi kognitif (Cardelle-Elawar, 1995).

Perkembangan metakognitif membenarkan pelajar untuk memindahkan pengetahuan kepada situasi baru di samping memberi impak kepada pengambil alihan, kefahaman, pengekalan dan aplikasi tentang perkara yang dipelajari pelajar dan seterusnya menyebabkan pelajar menjadi pelajar yang berkesan, pemikir kritis, dan penyelesaian masalah (Mevarech *et al.*, 2010). Misalnya, andaikan seorang kanak-kanak yang mendengar suatu hujah, kanak-kanak tersebut akan mendalami hujah yang didengarinya dan kemudian menggunakannya sebagai strategi untuk menyelesaikan masalah pada masa depan (Martinez, 2006). Ini adalah satu contoh dialog luaran yang menjadi dialog dalaman metakognitif yang merupakan matlamat dalam membangunkan metakognitif pelajar, dan matlamat

pengajaran menggalakkan perkembangan metakognitif (Holton & Clarke, 2006).

Perkembangan pemikiran metakognitif yang terbaik boleh dicapai dengan menyelaraskan latihan strategi dan sokongan sosiobudaya dalam aktiviti bilik darjah seharian (Lin, 2001). Di samping itu, persekitaran bilik darjah mesti menyokong pemikiran metakognitif. Menyediakan ilmu pengetahuan sahaja tanpa pengalaman atau pengalaman tanpa pengetahuan akan menyekat peningkatan perkembangan metakognitif pelajar (Livingston, 2003).

Pengkaji dari *North Central Regional Educational Laboratori* (1995) melaporkan bahawa telah diyakinkan oleh pelajar yang mempunyai metakognitif yang tinggi:

- (i) Yakin yang mereka boleh belajar.
- (ii) Membuat pertimbangan yang tepat tentang kejayaan mereka dalam pembelajaran.
- (iii) Fikirkan tentang kesilapan yang berlaku semasa tugas.
- (iv) Aktif mengembangkan pelbagai strategi untuk pembelajaran.
- (v) Padankan strategi untuk tugas pembelajaran dan membuat pelarasan yang bersesuaian.
- (vi) Meminta bimbingan dari rakan atau guru.
- (vii) Ambil masa untuk berfikir tentang pemikiran.
- (viii) Melihat diri sendiri sebagai pelajar dan pemikir.

Walau bagaimanapun, terdapat kemungkinan ciri-ciri ini menerangkan pelajar yang berjaya yang kemudiannya dikenali sebagai konsep metakognitif. Dari perbincangan di atas, ia boleh disimpulkan bahawa metakognitif adalah penting kerana ia membantu pelajar mengenalpasti keperluan untuk mengadaptasi aktiviti pembelajaran mereka terhadap permintaan tugas. Ia memberikan pelajar maklumat yang bersesuaian untuk merekabentuk pelan pembelajaran mereka sendiri. Ia mengalihkan tanggungjawab dari guru kepada pelajar dalam membangunkan keupayaan mereka untuk memantau dan mengawalselia aktiviti

kognitif mereka dalam pembelajaran.

3.0 METODOLOGI

Kerana kajian ini bertujuan untuk meneroka proses pengutaraan masalah dan metakognitif yang wujud semasa aktiviti tersebut maka sifat penerokaan telah disokong oleh penggunaan inkuiri kualitatif (Merriam, 2002). Kajian ini berbentuk penerokaan, pendekatan untuk mencari intipati pengalaman pelajar adalah yang paling baik dengan menjalankan kajian kes. Metodologi kajian kes membolehkan pengkaji untuk mengekalkan ciri-ciri holistik dan bermakna mengenai peristiwa kehidupan sebenar (Yin, 2009). Teknik pengumpulan data menggunakan tugas pelajar, pemikiran bersuara, dan temu bual separa berstruktur retrospektif. Responden dipilih dengan menggunakan kaedah persampelan bertujuan. Seramai 3 pelajar sekolah menengah gred 11 IPA2 mengambil bahagian dalam mengikuti sesi pemikiran bersuara dan temu bual. Data temu bual dan pemikiran bersuara dianalisis menggunakan teknik analisis tematik dan analisis perbandingan malar. Soalan yang digunakan dalam kajian ini diadaptasi dari buku teks, internet, dan soalan olimpik matematik peringkat Negara. Sebelum Instrumen digunakan dalam kajian sebenar, kajian rintis dan pengesahan dari pakar matematik sudah dijalankan bagi penambahbaikan instrumen kajian. dan untuk meningkatkan kesahan kajian ini. Dari analisis Indeks Kohen Kappa kedua pakar diperolehi purata indeks instrument kajian sebesar 0.75 (kategori baik).

Bagi mendapatkan maklumat untuk menjawab persoalan kajian ini, maka pengkaji telah menjalankan sesi pemikiran bersuara dan diteruskan dengan temu bual separa berstruktur retrospektif kepada tiga pelajar. Dalam sesi ini, setiap pelajar harus mengutarakan 5 soalan pengutaraan masalah yang terdiri dari tiga soalan penjanaan masalah (soalan 1, soalan 2 dan soalan 5) dan dua soalan penjanaan semula masalah (soalan 2 dan soalan 3). Purata

masa yang telah digunakan pelajar bagi menyelesaikan kelima soalan adalah 120 minit termasuk temubual dan masa pelajar untuk rehat.

Data yang digunakan dalam fasa analisis terdiri daripada transkrip pemikiran bersuara dan temu bual, nota pengkaji, dan jawapan pelajar. Rakaman daripada setiap sesi seterusnya disalin dan baris demi baris dianalisis. Setiap baris kemudian dikodkan untuk tingkah laku tertentu yang ditunjukkan berdasarkan rangka kerja yang dibangunkan untuk kajian ini. Tindakan dan pernyataan pelajar telah dikodkan sebagai membaca, memahami, menganalisis, merancang, meneroka, pelaksanaan, atau pengesahan. Proses metakognitif pelajar diperiksa dengan menganalisis semula transkrip pemikiran bersuara dengan menggunakan rangka kerja yang dibangunkan oleh Garofalo dan Lester (1985) yang terdiri daripada empat fasa (orientasi, organisasi, melaksanakan, dan verifikasi). Kategori yang sudah didapatkan daripada poses analisis data diberikan kepada dua pakar matematik bagi mendapatkan cadangan dan perbaikan dapatan kajian. Ini berguna bagi meningkatkan kesahan dapatan kajian. Dari analisis pengesahan kategori/tema dapatan kajian diperolehi purata indeks Kohen Kappa sebesar 0.796 (sangat baik).

4.0 ANALISIS DATA DAN KEPUTUSAN KAJIAN

Pelajar telah mengutarakan soalan dalam persekitaran yang terkawal di mana mereka diminta menggunakan kaedah pemikiran bersuara semasa mereka terlibat dalam pengutaraan masalah. Selepas mengutarakan masalah untuk setiap soalan, pelajar menjalani sesi temubual. Mereka ditanya mengenai alasan-alasan dan pemikiran mereka dalam mengutarakan masalah serta perasaan dan interpretasi mereka tentang proses yang mereka lakukan pada soalan tersebut.

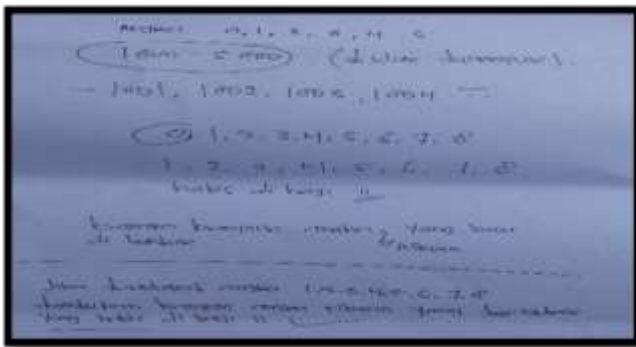
4.1 Proses Pengutaraan Masalah Yang Berlaku Pada Pelajar Sekolah Menengah

Dari analisis data diperolehi proses pengutaraan masalah yang berlaku pada pelajar sekolah menengah daerah Tanjungpinang, iaitu, hampir semua pelajar dalam kajian ini selalu memulakan soalan dengan membaca secara lantang, Semua pelajar telah memulakan pengutaraan masalah dengan membaca keseluruhan soalan sebelum membaca soalan lagi, pelajar membaca semula soalan dengan cara membaca bahagian yang penting sahaja, membaca untuk memahami soalan dengan mengkaitkan materi yang sudah dipelajari ataupun menganalisis dengan menggunakan logika, membaca semula soalan untuk menyemak (pengesahan) semula kondisi masalah. membaca semula soalan untuk melihat apakah mereka telah lupa bahagian yang penting dalam masalah itu, membaca semula soalan untuk lebih memahami soalan yang diberikan atau yang sudah diutarakan, membaca semula soalan dengan cara membaca semua ayat yang ada pada soalan. Membaca semula soalan dengan cara menggunakan bahasa dan ayat mereka sendiri. Contohnya Rino dalam soalan 1, setelah menemukan maklumat yang ia anggap penting, Rino tetap berupaya untuk memahami soalan. Ia membaca soalan secara berulang. Lalu ia mengulangnya kembali dengan bahasanya sendiri dan menuliskannya dikertas. Ini terlihat dalam pernyataannya:

- 13 tadi kan nak disusun menjadi angka ribuan antara 1000-5000
- 14 1000 dan 5000 itu tidak termasuk.
- 15 maknenye emm..kalau angka 1001 ,1002 ,1003 ,1004 ini boleh
- 16 oh, macam ade batasannya, mane yang boleh dan mane sahaje yang tak boleh

Dalam fasa memahami, biasanya pelajar mula-mula mengutarakan syarat-syarat masalah, matlamat masalah atau bahagian utama dari masalah itu, pelajar terlibat dalam pelbagai strategi untuk memantau pemahaman mereka tentang masalah ini,

seperti: membuat rajah, membuat bulatan atau garis pada beberapa maklumat, melihat note atau buku teks, pelajar menanyakan penjelasan daripada bahagian-bahagian masalah atau makna dari masalah itu sendiri, merepresentasi matlamat dan maklumat yang diberikan dalam masalah dengan menulisnya pada kertas kerja,



pelajar menyatakan semula masalah dengan ayat atau bahasa mereka sendiri, menyatakan semula soalan yang diberikan atau soalan yang diutarakan, dan terakhir pelajar berupaya mengingat semula materi yang lain yang mereka telah pelajari.

Berikut ini merupakan contoh proses pengutaraan masalah oleh Rino dalam soalan 1.

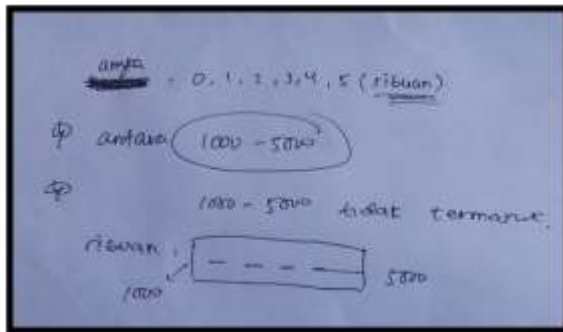
Rajah 1. Proses pengutaraan masalah oleh Rino pada soalan 1

Seterusnya, Fasa analisis soalan telah berlaku sebagai satu episod dari beberapa individu pada beberapa fasa, iaitu: selepas episod pemahaman, selepas tahapan meneroka, berlaku pada masa yang sama dengan fasa memahami, selepas fasa peraksanaan, terjadi pada masa yang sama dengan fasa merancang, dan terjadi

pada masa yang sama dengan fasa pelaksanaan. Dalam fasa ini pelajar cuba untuk memahami maklumat yang terdapat dalam masalah melalui penguraian masalah awal menjadi elemen-elemen asas, dengan merangka semula masalah, mencari hubungan antara syarat-syarat dan matlamat masalah, pelajar selalu melibatkan semula dengan pernyataan masalah yang diberikan dan menyatakan semula soalan itu dalam ayat mereka sendiri sebelum mengambil kira dan membuat pilihan tentang yang akan mereka utarakan. Contohnya, seperti pada transkrip dari Kahila soalan 1 berikut:

- 11 *ribuan maknaye ade 4 angka sahaje*
 12 *tapi mesti besar dari 1000 dan kecil dari 5000.*
 13 *(membaca maklumat dalam note)*
 14 *ok, saye nak buat soalan baru*

Baris 11 dan 12 dikod sebagai fasa analisis kerana Kahila menyatakan hubungan antara maklumat dengan tujuannya. Disini ia mengetahui bahawa angka ribuan harus disusun dengan 4 angka. Selepas itu, angka-angka itu juga harus lebih besar daripada 1000 dan harus lebih kecil dari 5000. Untuk fasa merancang hampir sebahagian pelajar tidak menjalankan fasa ini sebagai bahagian pengutaraan masalah mereka. Beberapa cara pelajar mengungkapkan pelan atau rancangan dalam aktiviti pengutaraan masalah ini. Iaitu: pelajar telah mengucapkan secara eksplisit tujuan yang hendak mereka capai, menyatakan untuk mencari atau menggunakan pelan yang lebih efisien, pelajar menyatakan pelan dengan menentukan subtujuan, pelajar melisankan atau mengeluarkan pemikiran mereka dan bertanya mengenai langkah-langkah dan strategi yang akan mereka jalankan, pelajar menyatakan apa yang mahu mereka lakukan, dan pelajar melaksanakan analisis pada masa yang sama dengan fasa merancang. Baris 13 merupakan proses membaca dan seterusnya baris 14 dikod sebagai merancang. Merancang kerana Kahila membuat suatu pernyataan yang akan ia laksanakan. Proses kerja pengutaraan masalah masalah soalan pertama sehingga tahapan ini seperti pada Rajah 2.



Rajah 2 Tahapan awal pengutaraan masalah soalan 1

Seterusnya, Kahila dalam soalan 4,

22 ok.

23 saya mesti merubah soalnya dulu

24 Selepas tu baru buat pertanyaannya

Pernyataan baris 22-24 pengkaji kod sebagai merancang, kerana Kahila telah memutuskan untuk menentukan apa yang mesti ia lakukan pertama sekali. Seperti pelajar yang lainnya dalam kajian ini, Kahila juga berupaya mengingat apa topik yang ia sukai dalam kehidupan hariannya dan akan digunakan dalam pengutaraan masalahnya. Setelah beberapa masa berikir, akhirnya Kahila memilih untuk menggantikan perlumbaan motosikal dengan kompetisi memasak.

Dalam fasa meneroka didapati kebanyakan dari pelajar terlibat terutamanya dalam strategi cuba-ralat secara sedar, pelajar memikirkan masalah yang sama atau mencari masalah yang berkaitan, dijalankan selepas pelajar membuat suatu kesilapan, fasa meneroka dengan membuat rajah, dan melaksanakan fasa ini pada masa yang bersamaan dengan fasa pengesahan. Contohnya Fara dalam soalan 1, Tahapan meneroka dilaksanakan Fara selepas melaksanakan beberapa proses analisis. Ia memulakan soalan barunya dengan merubah soalan yang diberikan dengan penambahan beberapa persyaran yang berbeza.

- 14 Apabila nombor yang akan disusun adalah ribuan
(*sambil menulis*)
- 15 Dan nombor yang pertama harus lebih besar dari
Satu
- 16 Hm
- 17 Ok, lepas tu
- 18 Angka ribuan yang disusun harus lebih kecil dari
5000.
- 19 Ok
- 20 Pertanyaannya iaitu berapakah susunan angka
ribuan yang boleh
- 21 terbentuk

Baris 14-21 dikod sebagai meneroka kerana proses ini dilaksanakan Fara tanpa adanya pelan terlebih dahulu. Jika dilihat dari pernyataan di atas Fara berupaya merubah beberapa persyaran dari soalan dengan menambah persyaran baru tetapi masih dalam konteks yang hampir sama. Selepas menghabiskan beberapa masa dalam tahapan meneroka, Fara langsung masuk pada tahapan yang pengkaji kod sebagai pengesahan. Sebelumnya ia telah mengatakan “Hm, betul tak ye..cuba di semak ye” (baris 22-24). Pada fasa ini Fara jelas-jelas berupaya untuk memeriksa pernyataan yang telah disusunnya untuk memastikan bahawa soalan yang ia utarakan sudah benar, dengan cara membaca semula soalan yang baru diutarakannya. Dalam temu bual, pengkaji telah menanyakan apakah cara ini yang biasa ia laksanakan dalam memeriksa pekerjaannya, dan Fara menjawab “*tergantung dari keinginan sahaje, tapi yang penting saye selalu menyemak semula apa yang sudah saya buat. Kadang-kadang semasa menyelesaikan soalan, selepas selesai menjawab soalan. Tapi yang paling sering saye buat iaitu saye menyemak kedua-duanya, maknanya semasa menjawab dan selepas menjawab soalan*”(P10).

Proses pengesahan pun dilanjutkan selepas itu, dimana Fara mencuba untuk memeriksa apakah soalan yang ia utarakan sudah sesuai dengan apa yang diinginkan.

- 36 Agaknye dah betul ni

- 37 Cuba saya baca semula soalnya
 38 Terdapat nombor yang diberikan 0,1,2,3,4,5
 39 Akan disusun menjadi angka ribuan
 40 Ok
 41 Dengan angka pertama mesti lebih besar dari satu
 42 Hitunglah berapa cara penyusunan boleh berlaku
 apabila nombor
 43 pada angka ribuan tidak boleh diulang
 44 Hm
 45 Dah siap.

Pernyataan-pernyataan di atas merupakan tahapan pengesahan yang dilakukan oleh Fara sebelum ia menyudahi proses pengutaraan masalahnya, kecuali baris 38-39 dan 41-42 yang dikod sebagai membaca dan pengesahan. Proses pengesahan yang dilakukan Fara iaitu dengan membaca semula masalah dan membandingkannya dengan masalah yang sudah diutarakannya. Selain itu pula, dalam soalan ini Fara melaksanakan proses pengesahan dengan cara melakukan interpretasi atau menentukan makna dari pada soalan yang diutarakannya, ini terlihat pada baris 41-43.

4.2 Proses Metakognitif Yang Wujud Semasa Pelajar Mengutarakan Masalah?

Proses metakogitif yang wujud dalam aktiviti pengutaraan masalah telah digolongkan oleh pengkaji menjadi 4 kategori, iaitu: Orientasi, Organisasi, Melaksanakan dan Verifikasi. Fasa orientasi dalam kajian ini merangkumi aktiviti ‘membaca soalan’ dan ‘memahami soalan’. Kajian ini mendapati bahawa pelajar kebanyakan telah terlibat dalam fasa orientasi untuk lima soalan yang diberikan. Meskipun fasa ini sering disebut sebagai fasa kognitif, tetapi beberapa pelajar telah menunjukkan pelbagai tingkah laku metakognitif sepanjang fasa ini. Mereka selalu membaca soalan secara lantang dan strategi pemantauan seperti ini membolehkan mereka untuk mengekalkan dan mengenal pasti komponen masalah.

Pelajar selalunya sudah membaca soalan secara keseluruhan sebelum membaca semula beberapa maklumat yang ada. Strategi kawalan seperti ini menyebabkan mereka untuk selalu fokus dan menyebabkan mereka boleh memahami soalan. Selepas mengutarakan masalah pelajar ini membaca semula bahagian penting mahupun keseluruhan soalan bagi melihat semula kondisi mahupun maklumat soalan atau untuk melihat jika mereka lupa bahagian penting dari soalan tersebut.aktiviti Ini akan menjadi satu strategi untuk mengawal kemungkinan kesilapan dalam merumuskan soalan baru. Tindakan ke atas proses metakognitif seperti ini telah mendorong suatu tingkah laku metakognitif. Sepanjang fasa memahami, beberapa pelajar juga telah terlibat dalam kemahiran metakognitif seperti menjedakan beberapa masa bagi memahami masalah dan menentukan usaha selanjutnya yang akan dilakukan dan untuk menilai keberhasilan pemikiran mereka dan dialog dalaman yang mengandungi pengutaraan soalan yang menggalakkan tingkah laku metakognitif. Pelajar berupaya mengingat semula materi yang lain yang mereka telah pelajari. Semasa mereka membuat suatu representasi tentang satu masalah sebenarnya secara mental mereka tetap terlibat pada proses-proses itu, dengan melibatkan diri dalam tindakan metakognitif yang berupa bertanya pada diri mereka sendiri.

Fasa organisasi dalam kajian ini merangkumi tahapan analisis dan tahapan merancang. Untuk fasa organisasi telah didapati bahawa segelintir pelajar yang melaksanakannya, khasnya tahapan analisis. Jadi fasa ini merupakan yang paling jarang sekali dilaksanakan oleh pelajar dalam aktiviti pengutaraan masalah. Namun begitu beberapa pelajar telah terlibat dalam tingkah laku metakognitif dalam upaya mencuba untuk memahami maklumat yang terdapat dalam masalah melalui penguraian masalah awal menjadi elemen-elemen asas, membuat semula masalah dan mencari hubungan antara kondisi dan tujuan soalan, pelajar memahami soalan dengan mencari hubungan antara syarat-syarat dan matlamat masalah, pelajar menyatakan semula soalan itu dalam ayat mereka sendiri sebelum mengambil kira dan membuat pilihan tentang apa

yang akan mereka utarakan. Seterusnya pelajar menyatakan untuk mencari atau menggunakan pelan yang lebih efisien. Ini semua juga merupakan suatu bukti adanya proses metakognitif yang telah berlaku pada pelajar. Dalam kajian ini, memantau pelan dan strategi yang telah dibuat merupakan proses yang sangat jelas telah berlaku pada beberapa pelajar. Terdapat bukti proses metakognitif telah berlaku pada fasa ini iaitu beberapa pelajar menguji apakah rancangan mereka telah masuk akal, mereka berusaha mencari pelan yang lebih efisien, dan mereka mengubah pelan yang sudah dibuat semasa tahapan ini. Pelajar tidak sentiasa membuat penilaian berkenaan dengan keberkesanan proses mereka mengutarakan masalah atau proses berfikirnya, tetapi berkenaan dengan pengetahuan kandungan dan perspektif dari masalah itu sendiri

Seterusnya, fasa melaksanakan merupakan fasa terbanyak yang kedua yang dilibatkan oleh pelajar dalam mengutarakan masalah selepas fasa organisasi. Fasa melaksanakan dalam kajian ini merangkumi tahapan meneroka dan tahapan pelaksanaan. Didapati kebanyakan pelajar telah menunjukkan proses metakognitif dalam mencari maklumat yang berkaitan, seperti merangka masalah yang diberikan (contohnya, memikirkan masalah yang sama, mencari masalah yang berkaitan) untuk menanyakan pada diri mereka sendiri tentang apa yang telah dilakukan sepanjang penerokaan dan bagaimana ini berkaitan dengan masalah asal dan matlamatnya, dengan tujuan supaya terus maju dalam proses penulisan. Kebanyakan pelajar mengalami satu masa dimana mereka merasa keliru dan ketidakpastian dalam mengutarakan masalah. Pelajar akan menggunakan situasi seperti itu untuk berhenti dan menilai semula pelan dan tindakan yang akan mereka lakukan. Ini adalah momen yang nampak dalam kawalan metakognitif kerana pelajar harus membuat keputusan tentang bagaimana untuk meneruskannya. Kebanyakan pelajar telah memberi tumpuan pada proses cuba-cuba untuk memilih langkah pengutaraan masalah bagi mendapatkan soalan baru. Namun begitu, pilihan strategi cuba-ralat ini merupakan suatu tingkah laku metakognitif. Tingkah laku metakognitif yang lain yang dipamerkan semasa fasa ini seperti

mempertimbangkan, dan menyusun pengetahuan yang mereka punyai berkaitan dengan masalah tersebut ketika membina pernyataan matematik yang berkaitan secara logik, menilai kesesuaian, pemantauan tindakan dan mengarahkan pemikiran dan tindakan mereka menuju pada penyelesaian. Adanya pemantauan, penilaian dan proses kawalselia yang berterusan adalah proses metakognitif penting yang membawa kepada hala tuju yang produktif melalui pengutaraan masalah.

Terakhir sekali adalah fasa verifikasi. Dapatan kajian ini menunjukkan hampir semua pelajar terlibat dalam fasa verifikasi, namun bilangan kekerapannya berbeza dengan fasa orientasi mahupun fasa melaksanakan. Terdapat beberapa tingkah laku yang melibatkan metakognitif semasa pelajar melaksanakan fasa ini, seperti: Pelajar telah menilai soalan yang diutarakan dengan memeriksa atau membaca soalan yang diberikan, pengesahan yang dijalankan kerana mereka merasa tidak yakin dengan pelaksanaan yang mereka sudah jalankan, sehingga mereka terlibat dalam proses pembetulan. Proses ini menunjukkan bahawa proses metakognitif telah berlaku pada pelajar dalam proses pengutaraan masalah khususnya dalam fasa verifikasi. Dalam penilaian proses melaksanakan atau pelaksanaan, pelajar menyemak semula bagaimana mereka mengatur susunan ayat dan kesesuaian soalan yang mereka utarakan dengan soalan semula dan juga bagaimana cara mereka mengmelaksanakan atau melaksanakannya sesuai dengan pelan yang telah mereka buat. Pelajar membandingkan keputusan akhir mereka dengan syarat-syarat masalah yang diberikan.

5.0 PERBINCANGAN

Dalam proses pengutaraan masalah, semua peserta memula setiap sesi pengutaraan masalah dengan membaca pernyataan masalah. Membaca pada tahapan berikutnya (setelah membaca pertama sekali) boleh membawa kepada pemilihan strategi berdasarkan pengalaman sebelumnya dalam pengutaraan. Dapatan ini selaras

dengan model penyelesaian masalah Schoenfeld (1992). Sepanjang episod pemahaman, para pelajar perlu untuk mempertimbangkan kandungan pengetahuan yang spesifik dan strategi-strategi yang berkaitan dengan masalah tersebut, dan ini selaras dengan kajian sebelumnya (Carlson & Bloom, 2005; Schoenfeld, 1992). Dapatan kajian ini menunjukkan bahawa analisis soalan telah berlaku pada kebanyakan pelajar selepas episod pemahaman, selepas tahapan meneroka, dan berlaku pada masa yang sama dengan fasa memahami. Dapatan kajian ini selari dengan kajian sebelumnya (Kuzle, 2011), yang menyatakan bahawa analisis terhadap soalan biasanya terjadi pada individu selepas episod pemahaman atau episod penerokaan atau ianya berlaku pada masa yang sama dengan episod pemahaman. Dalam fasa merancang pengkaji mendapati beberapa pelajar yang menyatakan pelan dengan menentukan subtujuan. Dapatan ini selari dengan kajian dalam penyelesaian masalah Phang (2009). Seterusnya pula, beberapa pelajar melisankan atau mengeluarkan pemikiran mereka dan bertanya mengenai langkah-langkah dan strategi yang akan mereka jalankan. Contohnya Sinta dalam soalan 2 (baris 11-18), yang selari dengan dapatan Sarver (2006). Pada fasa menulis soalan atau fasa pelaksanaan, pelajar telah terlibat dalam usaha untuk membentuk soalan dengan kondisi yang berbeza dari soalan semula dan soalan-soalan yang pernah mereka jumpai atau pelajari pada topik matematik sebelumnya. Ini selari dengan dapatan beberapa pengkaji sebelumnya yang menyatakan bahawa semasa pelajar menulis masalah mereka sendiri, mereka telah terlibat secara aktif dalam mewujudkan dan menaklukkan kurikulum matematik melalui pembentukan masalah mereka sendiri (Ross, Anand, & Morrison, 1988; Silver *et al.*, 1990). Pada masa memeriksa hasil pernyataan pengutaraan masalah, beberapa pelajar terlibat dalam menilai keberpatutan jawapan dari soalan yang mereka utarakan. Dapatan ini juga selari dengan kajian lepas (Schoenfeld, 1985).

Untuk proses metakognitif, dalam fasa memahami pelajar juga telah terlibat dalam pelbagai strategi untuk memantau pemahaman mereka tentang masalah ini, seperti: membuat rajah, dengan

membuat bulatan atau garis pada beberapa maklumat, seterusnya dengan melihat note atau buku teks. Dapatan ini juga selari dengan kajian terdahulu mengenai penyelesaian masalah (Artzt & Armour-Thomas, 1992; Schoenfeld, 1992). Pada fasa organisasi, pelajar telah terlibat dalam tingkah laku metakognitif dalam upaya mencuba untuk memahami maklumat yang terdapat dalam masalah melalui penguraian masalah awal menjadi elemen-elemen asas, membuat semula masalah dan mencari hubungan antara kondisi dan tujuan soalan, pelajar memahami soalan dengan mencari hubungan antara syarat-syarat dan matlamat masalah, pelajar menyatakan semula soalan itu dalam ayat mereka sendiri sebelum mengambil kira dan membuat pilihan tentang yang akan mereka utarakan. yang telah selari dengan kajian lepas mengenai penyelesaian masalah (Artzt & Armour-Thomas, 1992). Tingkah laku metakognitif yang dipamerkan semasa fasa ‘melaksanakan’ adalah selaras dengan kajian lepas (Artzt & Armour-Thomas, 1992; Carlson & Bloom, 2005) dan mengandungi: mempertimbangkan, dan menyusun pengetahuan yang mereka punyai berkaitan dengan masalah tersebut ketika membina pernyataan matematik yang berkaitan secara logik, menilai kesesuaian, pemantauan tindakan dan mengarahkan pemikiran dan tindakan mereka menuju pada penyelesaian. Literatur menunjukkan bahawa tingkah laku metakognitif seperti pemantauan aktif dan pengawalseliaan seterusnya dari proses-proses kognitif memainkan peranan penting dalam aktiviti penyelesaian masalah (Garofalo & Lester, 1985; Schoenfeld, 1985) dan tentunya dengan alasan yang sama pengkaji boleh katakan ini juga berlaku pada proses pengutaraan masalah.

6.0 KESIMPULAN

Dari analisis data diperolehi beberapa kesimpulan daripada kajian ini iaitu dalam mengutarakan masalah pelajar melakukan proses seperti pada skim berikut ini:



Rajah 3. Skim proses pengutaraan masalah pelajar

Proses metakogitif yang wujud dalam aktiviti pengutaraan masalah telah digolongkan oleh pengkaji menjadi 4 kategori, iaitu: Orientasi, Organisasi, Melaksanakan dan Verifikasi. Fasa orientasi dalam kajian ini merangkumi aktiviti ‘membaca soalan’ dan ‘memahami soalan’. Kajian ini mendapati bahawa pelajar kebanyakan telah terlibat dalam fasa orientasi untuk lima soalan yang diberikan. Fasa organisasi dalam kajian ini merangkumi tahapan analisis dan tahapan merancang. Untuk fasa organisasi telah didapati bahawa segelintir pelajar yang melaksanakannya, khasnya tahapan analisis. Jadi fasa ini merupakan yang paling jarang sekali dilaksanakan oleh pelajar dalam aktiviti pengutaraan masalah. Seterusnya, fasa melaksanakan merupakan fasa terbanyak yang kedua yang dilibatkan oleh pelajar dalam mengutarakan masalah selepas fasa organisasi. Fasa melaksanakan dalam kajian ini merangkumi tahapan meneroka dan tahapan pelaksanaan. Terakhir sekali adalah fasa verifikasi. Dapatan kajian ini menunjukkan hampir semua pelajar terlibat dalam fasa verifikasi, namun bilangan kekerapannya berbeza dengan fasa orientasi mahupun fasa melaksanakan

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EVALUATION OF THE IMPLICATIONS OF SOCIAL SOFTWARE FOR PROMOTING COLLABORATIVE LEARNING: A COGNITIVE LOAD PERSPECTIVE

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ABSTRACT

The proliferation of communication media and gadgets is a key feature of the information age. As a result, technology is continually invading the 21st century classroom. A major stride of technology in education in the form of media is the use of social software in education. Classroom across the world now employ these software that were originally meant for non-academic communication and learners have been found to be enthusiastic about and do anticipate using technology in education. The use of social software in education when viewed from its support for collaborative learning is tremendous. These media offer a platform for learner-focused education by promoting social interaction and collaborative learning. They stimulate proactive and reactive participation in addition to providing a platform for content sharing and synchronous classroom communication. Technology in education is however not without its negative consequences especially in terms of the cognitive load implications; that is the mental demand placed on the information processing system for learning based on the nature, type and design of the learning material observed in the inherent or extraneous processing the learner is exposed to during learning. This paper examines the implications of social software in Education from cognitive load perspectives. It highlights the

implications for teaching and learning, for schema formation as the ultimate goal of education and make recommendations for addressing the identified challenges.

Keywords: Cognitive Load, Social Media, Information Processing, Technology in Learning

INTRODUCTION

The ultimate goal of learning is the creation of schemas. These are single large, extensive information chunks stored in the long term memory. They are completely processed and stored information that require no further processing and are retrievable for use at any time (Recker, 1996; McLeod, 2009). Examples include the procedure for performing certain tasks that have been mastered whereby the entire process has become a single information unit in spite of the size. Effective teaching and learning techniques are therefore those that foster or support automation or creation of schemas.

Collaborative learning techniques are constantly being explored in teaching and learning to achieve improved effectiveness. The common thread in the various techniques employed is team work. According to the Educational Broadcasting Corporation or EBC (EBC, 2004), in collaborative learning, ‘students team together to explore a significant question or create a meaningful project’.

Opportunities are open for learning together and from one another such that strengths are shared and weaknesses can be strengthened. Students are able to engage in paced learning, individual differences are supported and in many cases, personal as well as group credit accrues. Peer learning, peer instruction and cooperative learning are examples of common collaborative learning techniques.

Various methods are leveraged to foster collaborative

learning; face-to-face and remote connections are possible depending on the learners and the learning situations as well as the resources available. In recent times, as the use of media and gadgets become ubiquitous, great advantage is being taken of the affordances of media and gadgets for educational purposes. Tools, gadgets, media, platforms, interfaces and similar concepts have therefore come to typify the current age. We now 'connect' and 'chat', sms and tweet, email, download, upload, facebook and do several other things that distinguish the current generation from those of the pre-information era.

As a result, technology is continually invading the 21st century classroom. These changes, according to the submission of Higher Education Funding Council for England (HEFCE), are due to the fact that technology enhances learning and learners have been found to be enthusiastic about and do anticipate using technology in education (HEFCE, 2009).

The Technology-Enhanced Learning (TEL) research of the United Kingdom also identified some benefits of technology in education to include its ability to support the learning of abstract concepts through the provision of visual systems that the learner can relate with. It can also enhance the productivity of both teachers and students through the use of software which cuts down the required effort, time and cost for some tasks (TEL, 2011). Other technologies (e.g. artificial intelligence systems) have the ability to anticipate and meet user-needs.

A major stride of technology in education in the form of media is the use of social software in education. Classroom across the world now employ these software that were originally meant for non-academic communication. The result has been found to be quite positive. These media offer a platform for learner-focused education by promoting social interaction and collaborative learning. They stimulate 'proactive and reactive participation' (Meishar-Tal, Kurtz & Pieterse, 2012) in addition to providing a platform for content sharing. Facebook is particularly outstanding in its classroom invasion. This is due to its design which affords a

lot of use for academic transactions.

Some of the factors that make Facebook a unique educational tool were identified by Meishar et al. (2012) through comparison with a conventional LMS. They identified among other elements, the factors of ownership (student-focused), creation, organization, management and sharing of content as well as synchronous interaction. They reported on several studies of Facebook as an academic tool and identified the advent of Facebook 'groups' as a major welcome development that was to redefine teacher-student communication as far as the platform is concerned.

OBJECTIVES

The use of social software in education when viewed from its support for collaborative learning is tremendous. However, technology in education is not without its negative consequences. According to Mayer (2009), the design of multimedia instruction uses two main approaches: the technology-centered and the learner-centered approaches; the focus of the latter being the nature of the human cognitive system. The three possible learning outcomes according to Mayer include no learning indicated by poor retention and poor transfer of learning, rote learning typified by good retention but poor transfer and meaningful learning which is characterized by excellent retention as well as transfer. This is however dependent on the learner's cognitive activity during learning.

One of the key issues of multimedia learning therefore focuses on the cognitive load implications. That is the mental demand placed on the information processing system for learning based on the nature, type and design of the learning material. Hence, this paper has as its focus an assessment of the implications of social software in Education from cognitive load perspectives. It will highlight the implications for teaching and learning and the ultimate goal of education and make recommendations for

addressing the identified challenges.

APPLICATIONS AND AFFORDANCES OF SOCIAL SOFTWARE IN EDUCATION

The use of social software in education affords several opportunities and advantages. Applications for in-class use as well as for out-of-class communication are extensive and have been explored by many teachers in institutions across the world. Some of the key affordances are discussed.

Collaborative Learning and Classroom Communication

Collaborative learning is greatly enhanced through the use of social software. Classroom communication and the sharing of content (graphics, video, animations, documents), links and many other educational materials are possible. Groups within a large class group can also collaborate separately and carry on private discussion among the few members. Such discussion can be labelled for easy reference or for a revisit by members.

Through Facebook groups, classroom communication is extended beyond the classroom. Sharing of content including documents and various multimedia materials are possible and 'live' interaction are enabled out of the classroom. These groups afford various modes of connection and participants in a course or programme can learn together 'alone' in their course group without interferences from 'outside' the class. The teacher is also able to provide guidance, corrections and share useful materials with the learners. The software can be great assets in distance education settings.

Fostering Improved Learning

According to Ludescha et al. (2000), various factors that support improved education include factors of collaboration learning. They submit that the identification of a clear purpose for the learning as well as the use of repetition is important for effective learning but also identified the creation of stories, making of breaks, creating laughter and enjoyment as well as the use of visuals among other things as important factors. These techniques work by supporting encoding of information which is fundamental to retention and learning. The techniques also underscore the importance of engagement and motivation in learning as factors that foster transfer and storage and the creation of schemas.



Figure 1: Techniques for Improving Education (Ludescha et al., 2000)

CHALLENGES OF SOCIAL SOFTWARE IN EDUCATION

One of the key challenges of technology in education came with the proliferation of media and gadgets. These tools came with the need for individuals to do many things at the same time; that is, to

multitask. This poses challenges to education and learning.

Multitasking and Distraction

According to Nurun (2013), 72 hours of video content alone goes online on YouTube every minute. This amounts to a 12-year content per week; putting the normal person under the constant pressure to meet up with so much information. Hence, the need to continually multitask. This situation is described by Nurun (2013) as the 'fear of missing out' or 'FOMO'. The effective 21st century person is thus often found trying to do a number of things at the same time. This is also carried on into the classroom.

Multitasking is defined by Kirschner and Karpinski (2010) as the 'simultaneous execution of two or more processing activities'. It is a parallel processing function which Prensky (2003) believe the members of the 'net' generation are enabled for by virtue of their relationship with technology. However, many researchers (Bullen, et al, 2011; Kennedy et al., 2007&2008; Kvavik, 2005) opined humans are incapable of multitasking. This is in spite of the fact that supporters of multitasking believe it is the 'way to go' in the age of information and it is promoted by the business world and touted as the selling point for new tools, gadgets and media. Invariably, humans are expected to function like a these gadgets and tools would.

There is however no denying the fact that multitasking constitutes a great source of distraction. Ritchel (2009) in his article reported on a Havard study of distracted driving in America which identifies 2,600 annual deaths and 330, 000 moderate and severe injury cases resulting from cell-phone distractions during driving alone. There is therefore reason to expect 'danger' to learning as well. Research actually attests to its detrimental effect on the brain and personality (Wallis, 2010) as well as the fact that 'distractions make learning hard' (Stevenson, 2006).

COGNITIVE LOAD IMPLICATIONS OF SOCIAL SOFTWARE IN EDUCATION

Information processing in the human memory system is influenced by the design of the HCA. This is because of the limitations of the working memory responsible for information processing. Cognitive resources are allocated in the HCA for the handling of cognitive load which have three components as identified. When social software is being used, the learner is exposed to multiple processing and distractions from sources including friends' posts, chats, uploads, links, notifications and many other factors inherent in the design of the social software. The implications of social software in education viewed from cognitive load perspectives is therefore discussed from information processing standpoints.

The Human Cognitive Architecture (HCA) and Information Processing

The HCA describes the nature, design and properties of the human memory system (Sweller et al., 1998). It describes the manner in which information is processed by humans as well as the limitations of the human memory system. The HCA provides a layout of the memory system as a 3-part structure (Figure 2) composed of an external or physical sensory memory, a working memory that constitutes the seat of information processing (Paas et al., 2008; Paas et al, 2004a, b) and a long term memory that is responsible for storage of processed information (Mayer & Moreno, 2003; Kirsch, 2000).

The key significance of the HCA in education lies in the capacity of the working memory (Paas et al., 2008; Paas et al, 2004a, b). While the long term memory is unlimited in its capacity, the working memory is quite limited; able to process only a very small amount of information at a given time. As a result of this,

when there is information overload, the processing demand may exceed the capacity of the working memory and the processing become ineffective, resulting in consequent loss of material.

Mayer (2009) identified the implications of cognitive load for essential processing, effective processing and extraneous processing. He discussed the need to employ cognitive load principles in the use of media and technology in education and provided insights on the means by which this might be achieved.

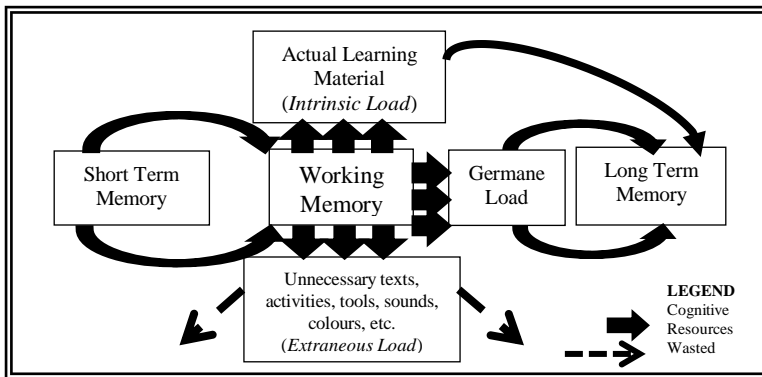


Figure 2: Cognitive Load and Resource Allocation in the HCA

Cognitive Load and Information Processing

According to cognitive load theory (Paas et al., 2008; Paas et al., 2004a, b; Sweller et al., 1998), every learning material imposes a mental demand or cognitive load on the working memory. Total cognitive load (CL_t) have three components (Mayer, 2004, Mayer & Moreno, 2003; Paas et al, 2003) that are summative in nature. These are the intrinsic load (CL_{int}), the extraneous load (CL_{ext}) and the germane load (CL_{ger}) such that,

$$CL_t = CL_{int} + CL_{ext} + CL_{ger}$$

This total capacity (CL_t) cannot be exceeded; hence an increase in one component can only cause a decrease in others or vice versa.

The CL_{int} is a property of the learning material which is non-manipulable while the CL_{ext} and CL_{ger} can be manipulated. However, while both CL_{ext} and CL_{ger} are functions of instructional design/presentation, CL_{ext} is undesirable because it constitutes a waste of cognitive resources and does not contribute to learning. CL_{ext} is occasioned by bad presentation of instruction, unnecessary materials or activities that are unrelated to or distracting from the learning tasks including multitasks and distractions.

Implications for essential processing

The learning material itself constitutes the intrinsic load. This load represents the mental demand inherent in and native to the learning material. It is the cognitive resource that is native to the learning material and it is unalterable. It can only be managed in such a way that the learner is supported to process it effectively. Mayer suggested the use of paced presentation for addressing this. Presentation of instruction in small sequential parts rather than as a whole chunk of heavy material will assist the learner in mastering content in a stepwise manner such that cognitive resources can be allocated according to the need of each part.

Implications for effective processing

CL_{ger} contributes positively to learning. It is invested in effective transfer and storage of processed materials, in other words, the formation of schemas. This refers to chunks of learnt materials that have been automated and needs no more processing but available for use whenever needed. Good instruction is therefore one that maximises CL_{ger} .

Implications for extraneous processing

When multitasking is viewed within the context of cognitive load theory, it can be understood that having to handle many tasks simultaneously demands a correspondingly huge working memory capacity that can easily become unaffordable for the memory system, thereby resulting in ineffective learning. These include unnecessary texts, graphics, sounds and other cognitive activities that may occur during learning. They constitute the extraneous load, causing unnecessary processing, transfer losses and poor storage (reduced germane load) and a defeat of the ultimate goal of instruction

Allocation of cognitive resources in the HCA is depicted in Figure 1.1. The short, thick arrows represent cognitive resources allocated to intrinsic, germane and extraneous loads in the Working Memory. The long broken arrows represent wasted cognitive resources devoted to extraneous processing that makes no contribution to learning but rather defeats transfer and storage.

Implications for Teaching and Learning

The implications of social software in education from cognitive load viewpoint can be summarized from working memory and long term memory viewpoints considering the foregoing. When social media is employed in education, the design of the interface could constitute a source of multitasking and distraction to the learner. These distractions constitute cognitive load on the working memory system and thereby constitute a competition for the consumption of cognitive resources. Extraneous processing imposes additional threat on concentration and engagement with learning, resulting in ineffective learning.

It is possible that extraneous processing may override the learning materials in the competition for cognitive resources due to the fact that they are less demanding on attention, more engaging

and more motivating. This has the capacity to jeopardize the entire learning process. Furthermore, the demands placed by this extraneous processing in addition to those legitimately placed by essential processing of actual learning material may exceed the working memory capacity.

Failure of processing in the working memory will result in ineffective transfer and consequent ineffective storage thereby jeopardizing the formation of schema and compromising of the goal of education.

CONCLUSIONS

Social software in education have great benefits as effective platforms for multimedia education, content sharing and collaborations. They can provide cost-effective platforms for collaborative and peer learning and academic communications at various levels and modes of education.

The fact that they are designed primarily for social and not academic communication must however not be lost on especially learners and designers of instruction. Efforts at using these software should be with cognizance to the cognitive load implications of their employment to achieve effectiveness.

RECOMMENDATIONS

The use of social software should leverage on cognitive load principles as presented in the cognitive load theory. Principles that foster essential and effective processing and those that reduce extraneous processing should be employed for use with social software for education. Instructional methods that leverage on the increase of learner motivation and engagement with learning materials should also be employed.

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MENJANA KEMAHIRAN BERFIKIR ARAS TINGGI MELALUI PENGUTARAAN MASALAH MATEMATIK - SATU KERANGKA TEORI

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ABSTRAK

Pengutaraan masalah matematik merupakan salah satu pedagogi matematik yang dikatakan dapat menjana kemahiran berfikir aras tinggi (KBAT) pelajar. Bagi membolehkan pedagogi ini dapat dilaksanakan dengan berkesan dalam proses pengajaran dan pembelajaran pengutaraan masalah matematik, beberapa teori pembelajaran dan pendekatan telah dikenal pasti dalam membentuk satu kerangka teori yang akan mendasari kajian yang dijalankan. Teori-teori yang terlibat ialah Teori Sosial Konstruktivisme (Vygotsky, 1978), pendekatan Inkuiri Terbimbing (Hanson, 2006) dan Taksonomi Bloom Semakan Semula (Anderson & Krathwohl, 2001). Kerangka teori yang dicadangkan ini diharapkan dapat dijadikan panduan oleh guru dalam usaha untuk menyahut seruan KPM bagi menjana KBAT dalam kalangan pelajar dan seterusnya dapat memperbaiki kedudukan Malaysia dalam pentaksiran antarabangsa seperti Trends in Mathematics and Science Studies (TIMSS) dan Programme International Student Assessment (PISA).

Kata kunci: pengutaraan masalah matematik, kemahiran berfikir aras tinggi

PENGENALAN

Sistem pendidikan di Malaysia sedang mengalami satu proses revolusi dan transformasi melalui pendekatan yang diaplikasikan di dalam sesi pengajaran dan pembelajaran. Situasi ini secara jelasnya menekankan pendekatan pengajaran yang lebih memberi keutamaan terhadap kemahiran berfikir aras tinggi (KBAT) pelajar. Hal ini secara tidak langsung telah membawa kepada reformasi pedagogi matematik yang telah menjadi kebiasaan diamalkan di dalam kelas yang bersifat konvensional dan satu hala ke arah yang lebih dinamik di mana para pelajar digalakkan berfikir semasa proses pengajaran dan pembelajaran berlangsung.

Salah satu pedagogi matematik yang dikatakan dapat menjana KBAT pelajar ialah melalui pengutaraan masalah matematik (Chin & Kayalvizhi, 2002; Ghasempour *et al.*, 2013; Ghasempour *et al.*, 2012; Nardone & Lee, 2010). Menurut Bonotto (2010, 2013), pengutaraan masalah ditakrifkan sebagai proses menggunakan pengetahuan matematik dan interpretasi bagi mengutarakan masalah yang bermakna. Manakala dalam kajian-kajian Gonzales (1994, 1996), Silver (1994), Silver *et al.* (1996) dan Stickless (2006), mereka menjelaskan maksud mengutarakan masalah matematik sebagai membina (*generation*) masalah baru atau mengungkap semula (*formulation*) masalah yang lama.

Pengutaraan masalah juga sering dikaitkan dengan penyelesaian masalah (Kar *et al.*, 2010; Silver, 2013). Sebagai contoh, Silver (1994), mengklasifikasikan pengutaraan masalah berdasarkan kedudukannya iaitu sebelum (*pre solution*), semasa (*within solution*) dan selepas penyelesaian masalah (*post solution*). Namun, menurut Mestre (2002), Pittalis *et al.*, (2004) dan Arian dan Unal (2014), pengutaraan masalah adalah lebih sukar berbanding penyelesaian masalah kerana ia melibatkan aktiviti

kognitif yang kompleks.

Kajian tentang pengutaraan masalah matematik menunjukkan bahawa ianya dapat memberi kesan yang positif terhadap kognitif pelajar (Sheikhzade, 2009; Voica & Singer, 2013), namun masih belum diberi perhatian sewajarnya jika dibandingkan dengan penyelesaian masalah (Contreras, 2005). Hal ini demikian adalah kerana kurangnya kerangka teori yang komprehensif dapat menerangkan bagaimana pengutaraan masalah matematik dapat dijalankan secara realistik dalam kelas matematik (Ghasempour *et al.*, 2013).

Oleh itu, beberapa teori pembelajaran dan pendekatan telah dikenal pasti dalam usaha menghasilkan kerangka teori yang komprehensif iaitu Teori Sosial Konstruktivisme (Vygotsky, 1978), pendekatan Inkuiri Terbimbing (Hanson, 2006) dan Taksonomi Bloom Semakan Semula (Anderson & Krathwohl, 2001). Kesemua teori dan pendekatan ini akan dibincangkan secara mendalam bagaimana setiap satunya dapat diaplikasikan dalam persekitaran pengajaran dan pembelajaran pengutaraan masalah matematik bagi menjana KBAT pelajar.

TEORI SOSIAL KONSTRUKTIVISME DAN AKTIVITI PENGUTARAAN MASALAH MATEMATIK

Teori Sosial Konstruktivisme adalah bersifat sosial dan dipelopori oleh Vygotsky yang menekankan bahawa interaksi interpersonal sama ada dengan rakan sebaya atau orang dewasa yang lebih berketrampilan dapat membantu memperkembangkan pengetahuan individu. Menurut perspektif Vygotsky, kajian tentang perkembangan kognitif melihat kepada proses penglibatan seseorang itu semasa perbincangan (Palincsar, 1998). Tambahan pula, interaksi melalui perbincangan antara pelajar menyediakan mekanisme untuk meningkatkan pemikiran aras tinggi dengan mewujudkan konflik kognitif dan seterusnya membawa kepada perspektif yang baru.

Perbincangan antara rakan juga akan membantu pelajar itu mengubah atau mengukuhkan idea mereka. Pengetahuan asas yang kukuh dapat dibina melalui perbincangan apabila pelajar berpeluang mengemukakan pendapat dan mendengar idea orang lain. Ini bermakna fokus adalah lebih terhadap pembelajaran pelajar berbanding pengajaran guru (Sthapornnanon *et al.*, 2009). Oleh yang demikian, adalah penting untuk mewujudkan persekitaran pembelajaran yang dapat menggalakkan interaksi sosial dalam kelas matematik khususnya dalam aktiviti pengutaraan masalah matematik.

Pengutaraan masalah matematik merupakan kaedah pengajaran dan pembelajaran yang masih baru kepada para pelajar kerana mereka lebih terbiasa dengan kaedah pembelajaran menyelesaikan masalah matematik. Oleh itu, interaksi sosial antara rakan dan guru adalah amat penting di mana ianya akan mencetuskan resolusi konflik dan seterusnya membantu pelajar mencapai peringkat kognitif yang lebih tinggi.

INKUIRI TERBIMBING DAN MODUL PENGUTARAAN MASALAH MATEMATIK

Carin dan Sund (1971) mendefinisikan inkuiri sebagai proses untuk mendapatkan maklumat yang melibatkan aktiviti penerokaan yang berasaskan penyoalan. Menggalakkan aktiviti penyoalan dalam proses pembelajaran dan pengajaran akan memberi peluang kepada pelajar untuk merasai pengalaman yang dilalui oleh ahli matematik yang terdahulu, iaitu suatu proses yang *fundamental* dalam pembentukan idea matematik (Glaserfeld, 1991). Para pelajar juga digalakkan bertanya soalan kepada guru bagi mengelakkan berlakunya miskonsepsi dalam diri pelajar (Guvercin & Verbovskiy, 2014). Selain itu, idea dan konsep matematik akan dapat diperkembangkan dalam diri pelajar melalui penglibatan pelajar secara aktif dalam proses pembelajaran.

Penglibatan aktif pelajar amat dititikberatkan dalam

pendekatan inkuiri. Oleh itu, Herron (1971) telah membahagikan pembelajaran secara inkuiri kepada empat aras yang berbeza yang mana setiap aras tersebut bergantung kepada peranan yang dimainkan oleh pelajar dalam proses pembelajaran mereka. Semakin tinggi aras pembelajaran berasaskan inkuiri, semakin banyak peranan yang disumbangkan oleh pelajar dalam aktiviti pembelajaran. **Jadual 1** menunjukkan empat aras dalam pembelajaran inkuiri.

Jadual 1: Empat aras dalam Pembelajaran Inkuiri (Herron, 1971)

Aras	Jenis Inkuiri	Penerangan
0	Pengesahan (<i>Confirmation</i>)	Pelajar mengesahkan prinsip-prinsip tertentu berdasarkan aktiviti penerangan oleh guru dan keputusan sesuatu tugas telah diketahui terlebih awal
1	Inkuiri Berstruktur (<i>Structured Inquiry</i>)	Pelajar melakukan penerokaan berdasarkan soalan dan langkah-langkah yang telah ditentukan oleh guru
2	Inkuiri Terbimbing (<i>Guided Inquiry</i>)	Pelajar melakukan penerokaan berdasarkan soalan-soalan yang telah disediakan oleh guru dan pemilihan langkah-langkah ditentukan sendiri oleh pelajar
3	Inkuiri Terbuka (<i>Open Inquiry</i>)	Pelajar melakukan penerokaan berdasarkan soalan-soalan dan langkah-langkah yang dibina dan ditentukan sendiri oleh pelajar

Untuk memilih pendekatan inkuiri yang terlibat, beberapa perkara perlu dipertimbangkan seperti tahap dan keupayaan berfikir pelajar-pelajar yang terlibat. Sebagai contoh, inkuiri terbuka mungkin lebih sesuai untuk pelajar-pelajar di peringkat pengajian tinggi kerana pembelajaran dikuasai secara mutlak oleh pelajar. Manakala inkuiri terbimbing mungkin lebih sesuai untuk pelajar-pelajar di peringkat sekolah kerana pelajar masih lagi memainkan peranan yang penting dalam proses pembelajaran dengan bantuan yang minima oleh guru.

Inkuiri terbimbing merupakan pendekatan yang difikirkan sesuai dalam persekitaran pengutaraan masalah matematik kerana

pelajar yang berada di peringkat ini perlu diberikan bimbingan asas oleh guru bagi mencetuskan persoalan dan merangsang mereka untuk terus membuat penerokaan. Bimbingan daripada guru masih diperlukan kerana pelajar masih belum terbiasa dengan kaedah pembelajaran pengutaraan masalah matematik. Guru akan bertindak sebagai fasilitator supaya pelajar tidak menemui jalan buntu dalam mengutarakan masalah matematik yang berkualiti.

Menurut Hanson (2006), terdapat 3 fasa dalam kitaran pembelajaran inkuiri terbimbing iaitu penerokaan (*exploration*), pembentukan konsep (*concept invention or formation*) dan aplikasi (*application*). **Jadual 2** menunjukkan penerangan tentang setiap fasa dalam kitaran pembelajaran inkuiri terbimbing oleh Hanson (2006).

Jadual 2: Fasa pembelajaran inkuiri terbimbing (Hanson, 2006)

Fasa Pembelajaran	Penerangan
Penerokaan (<i>exploration</i>)	Pelajar akan meneroka konsep-konsep yang berkaitan dengan tajuk yang akan dipelajari dan guru bertindak sebagai pembimbing.
Pembentukan Konsep (<i>concept invention or formation</i>)	Pelajar akan mengaitkan apa yang telah dipelajari dalam fasa penerokaan untuk membentuk konsep matematik
Aplikasi (<i>application</i>)	Pelajar mengaplikasikan konsep yang telah difahami dengan situasi yang berbeza iaitu dalam aktiviti pengutaraan masalah matematik.

Menurut Irfan dan Sajap (2006), pendekatan inkuiri terbimbing lebih bersifat induktif. Ia dikatakan berupaya membantu dalam pemindahan maklumat secara aktif dengan menyediakan suasana pembelajaran yang dapat mempertingkatkan kemahiran berfikir tahap tinggi. Hal ini adalah apabila pelajar melalui fasa-fasa tersebut, mereka akan menggunakan kemahiran kognitif dalam meneroka konsep matematik. Apabila sesuatu konsep matematik telah dikuasai, mereka perlu mengaplikasikannya dengan situasi yang berbeza untuk mengukuhkan kefahaman terhadap konsep yang telah dipelajari. Oleh itu, pendekatan inkuiri adalah berbeza dengan

pendekatan tradisional yang hanya menekankan hafalan dan kurang atau tiada langsung perbincangan (Glickman, 1991).

Jika ditelusuri kajian-kajian tentang pengutaraan masalah matematik, masih terdapat beberapa isu yang perlu diberi perhatian. Di antaranya ialah:

1. Guru dan pelajar masih tidak terbiasa dengan kaedah pengutaraan masalah matematik menyebabkan ia sukar untuk diimplementasikan di dalam kelas matematik (Leung, 2013).
2. Guru memerlukan teknik dan kemahiran untuk mengendalikan tugas pengutaraan masalah matematik supaya pengajaran dan pembelajaran dapat disampaikan dengan baik kepada pelajar (Leung, 2013).
3. Tugas pengutaraan masalah matematik yang diberikan kepada pelajar kadangkala tidak jelas menyebabkan pelajar tidak dapat mengutarakan masalah dengan baik (Silver, 2013).
4. Pelajar juga didapati tidak yakin dalam mengutarakan masalah matematik (Akay & Boz, 2009).

Kesemua isu yang dinyatakan secara tidak langsung membawa kepada keperluan untuk menghasilkan modul pengutaraan masalah matematik berdasarkan kitaran pembelajaran inkuiri terbimbing seperti yang dicadangkan oleh Hanson (2006). Modul yang mengandungi pengajaran guru, pembelajaran pelajar serta tugas pengutaraan masalah matematik diharapkan dapat membantu pelajar menggunakan kognitif secara maksimum dalam menjana kemahiran berfikir aras tinggi. Pelajar akan diberi peluang untuk meneroka sendiri konsep-konsep matematik dan keadaan ini memberi ruang kepada pelajar untuk berfikir dengan lebih fleksibel tanpa terikat dengan fakta dan prosedur di dalam buku teks. Guru pula bertindak sebagai fasilitator semasa pelajar mengaplikasikan apa yang telah mereka pelajari bagi mengutarakan masalah matematik yang berkualiti.

TAKSONOMI BLOOM SEMAKAN SEMULA DAN KEMAHIRAN BERFIKIR ARAS TINGGI (KBAT)

Taksonomi Bloom telah diperkenalkan oleh Benjamin Bloom dan rakan-rakannya pada tahun 1956 (Bloom, 1976). Ia menekankan proses mental dan kemahiran berfikir yang disusun daripada peringkat rendah hingga peringkat tinggi. Susunannya daripada mudah kepada kompleks dan daripada konkrit kepada abstrak (Krathwohl, 2002). Enam hierarki tersebut disusun daripada peringkat pengetahuan, pemahaman, aplikasi, analisis, sintesis, dan penilaian (Noraini, 2001).

Selari dengan perkembangan teori pembelajaran daripada teori behaviorisme kepada teori konstruktivisme, Taksonomi Bloom ini telah disemak semula oleh Anderson, Krathwohl dan rakan-rakan (Krathwohl, 2002). Salah satu perubahan yang dilakukan terhadap Taksonomi Bloom 1956 ialah daripada ‘kata nama’ kepada ‘kata kerja’ dan enam hierarki yang baru adalah mengetahui, memahami, mengaplikasi, menganalisis, menilai, dan mencipta. Keenam-enam tahap ini dikenali sebagai tahap dimensi proses kognitif. Kementerian Pendidikan Malaysia (KPM) merujuk KBAT kepada empat aras tertinggi dalam Taksonomi Bloom Semakan Semula (Anderson & Krathwohl, 2001) iaitu :

1. **Mengaplikasi** : menggunakan pengetahuan, kemahiran dan nilai dalam situasi berlainan untuk melaksanakan sesuatu perkara
2. **Menganalisis** : mencerakinkan maklumat kepada bahagian kecil untuk memahami dengan lebih mendalam serta hubungan kait antara bahagian berkenaan
3. **Menilai** : membuat pertimbangan dan keputusan menggunakan pengetahuan, pengalaman, kemahiran dan nilai serta membuat justifikasi
4. **Mencipta** : menghasilkan idea, produk dan kaedah yang kreatif dan inovatif

Tahap tertinggi dalam dimensi proses kognitif ialah mencipta

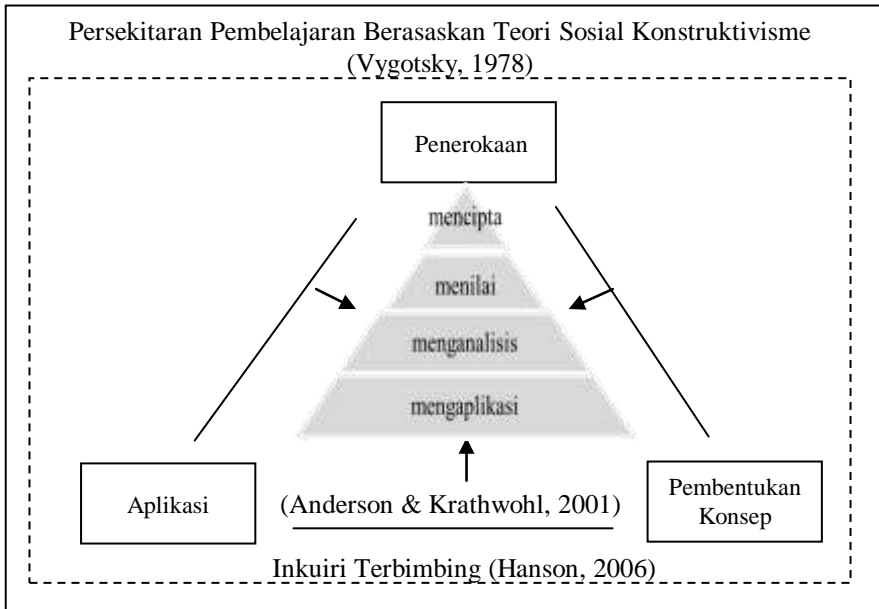
iaitu pelajar dapat menghasilkan sesuatu hasil daripada pembelajaran yang dilalui. Dalam konteks ini, para pelajar diharapkan dapat mengutarakan masalah matematik yang berkualiti. Masalah matematik yang berkualiti ialah masalah yang mempunyai penyelesaian dan tahap kompleksiti yang tinggi (Ling & Leng, 2008).

KBAT sememangnya diperlukan dalam pengajaran dan pembelajaran matematik. Isu yang perlu diberikan perhatian, adalah bagaimana cara menilai proses pemikiran tahap tinggi. Penilaian perlu diberi kepada proses yang dilalui semasa melaksanakan sesuatu tugas, bukannya kepada hasil yang diselesaikan (Brookhart, 2008). Oleh itu, adalah penting untuk melihat proses berfikir pelajar dalam mengutarakan masalah matematik khususnya pada peringkat kognitif yang tinggi.

CADANGAN KERANGKA TEORI KAJIAN

Menurut Creswell (2008), kerangka teori adalah satu koleksi konsep yang saling berkait seperti satu teori. Kerangka teori kajian ini dibina untuk memberi penerangan mengenai perhubungan yang komprehensif antara Teori Sosial Konstruktivisme (Vygotsky, 1978), pendekatan Inkuiri Terbimbing (Hanson, 2006) dan Taksonomi Bloom Semakan Semula (Anderson & Krathwohl, 2001) untuk kajian pengutaraan masalah matematik.

Rajah 1 menunjukkan ketiga-tiga teori yang akan mendasari kajian yang dijalankan.



KESIMPULAN

Kerangka teori yang dicadangkan ini diharapkan dapat dijadikan panduan oleh guru dalam usaha menyahut seruan KPM bagi meningkatkan KBAT pelajar dan seterusnya dapat memperbaiki kedudukan Malaysia dalam pentaksiran antarabangsa seperti *Trends in Mathematics and Science Studies* (TIMSS) dan *Programme International Student Assessment* (PISA). Oleh yang demikian, melalui persekitaran pembelajaran sosial konstruktivisme dan pendekatan inkuiri terbimbing, kemahiran berfikir aras tinggi pelajar mampu dijana melalui pengajaran dan pembelajaran pengutaraan masalah matematik.

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USING TECHNOLOGY IN LEARNING MOVEMENT SKILLS AMONG STUDENTS IN HIGHER EDUCATION: A REVIEW

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Zainuddin

ABSTRACT

The purpose of this study was to investigate the effects of a multimedia sports courseware in teaching movement skills, which will be developed based on the Simpson's Psychomotor Domain Taxonomy. Integrated with a video analysis technology and simulation, the courseware would be developed for all sport subjects in the sports science syllabus. In the first phase of this study, students' difficulties with understanding movement skills were identified and the information obtained will be used to develop the software as planned. However, this paper highlights the methodology that will be applied in the actual research. It will also describe in detail the literature review, the methods for data analysis for the actual study as well as the expected findings.

Keywords: Learning movement skills; Technology in teaching and learning; Technology learning materials

INTRODUCTION

Students in this era of ICT are developing differently in terms of their values, ways of thinking, ways of acting, motivation sources,

ICT skills, age, ethnicity, economic group, religion, work experience, etc. (Mohamad Bilal Ali, 2009). Other changes that have occurred in this era include the goal of learning towards developing the overall human potential, the concept of lifelong learning, learning without the constraints of time and space, learning according to one's requirement and styles as well as student-centered curriculum (Nan-Zhao, 2006). The different stages in the evolution of education have slowly changed the methods for teaching and learning. Thus, in keeping with the times, the teaching and learning process should also be infused with the use of technology, depending on learning suitability (Adjah Naqkiah Mazlan, Jamalludin Harun, Zainal Abidin Zainuddin, 2012). Teaching methods have also change from being teacher-based to student-based. According to Mohamad Bilal Ali (2009), the role of teachers has evolved from being the main source of knowledge into facilitators. These developments had transpired concurrently with the development of technology in education.

In the teaching and learning process, numerous issues have to be dealt with especially issues regarding students. As such, teaching and learning movement skill in sports are no exception. This is due to the different personalities in every aspect among the students (Mohamad Bilal Ali, 2009). According to Lemire (1996) and Reiff (1992), each student has his own unique learning styles. Meanwhile, Rahim (1995) stated that each individual is dissimilar with regards to their learning style, skill, manners, talent as well as interest and these dissimilarities should be focused on in order to create meaningful learning environments. Thus, the teaching and learning process have to be improved to cater to students' different capabilities.

LITERATURE REVIEW

Problem in Learning Movement Skills

These days, an educator's responsibility is getting increasingly challenging, with the high demands of society and their surroundings. Rivalry in the pursuit of success and the best education is also a common phenomenon. Therefore, educators often use various techniques and methods to ensure that teaching and learning is properly conducted.

The traditional way of learning plus the use of modules as teaching tools are no longer suitable for some subjects, such as learning movement skills. This is due to problems faced during learning movement skills that are different between the students and that this particular subject involves both theoretical and practical learning. The impact from lack of effective teaching will result in difficulty when learning about movement skills and when to apply it. Thus, teaching methods that are systematic and take into account the problems regarding learning movement skills should be implemented by combining theory and practice in learning via technology.

When viewed from the context of learning, the existing methods for learning movement skills is by teaching the theoretical aspects and demonstrating the basic movements. This is followed by teaching the general movements and later, specific movements or, more specifically, movements that are exclusive for a type of game will be applied. Unfortunately, theoretical and demonstrative teaching methods have weaknesses and are still not enough to allow students to truly master a movement. In order to do so, students need a long training period and exposures to real life situations. It is believed that students will understand movements better if they learn the movements via video analysis or something similar.

Additionally, there are still some other aspects that should be prioritized to help improve the teaching and learning process in general and learning movement skills in particular. Fortunately, with

the growing technology, various teaching aids that involve movement skills in the form of multimedia software have been developed. Numerous studies have been conducted to prove the advantages of using multimedia software for the acquisition of skills. For example, several studies support the use of multimedia software for learning new skills such as studies by Mohd Arif and Mohd Jasmy (2002), Mohd Jasmy et al. (2002), Wolfgang (2005) and Abang Ismail and Mohd Taib (2007). However, the overall level of proficiency for movement skills is still quite moderate despite it having a positive effect. This fact is supported by the findings in a study conducted by Arfan (2001), where the positive effect of using such software is only 42.53%. It was concluded that this could be due to multimedia softwares that were developed without focusing on aspects such as students' different approaches and learning styles, their learning environment, varying level of proficiencies, etc.

Teaching Movement Skills Using Multimedia Courseware Integrated With Simulation And Video Analysis Capability

Thus, this current study will apply the self-exploration learning approach because it offers numerous advantages when applied for learning movement skills. In order to meet the comprehensive requirements of students' varied learning environments, the constructivist learning environment was chosen because its features are more suitable for learning movement skills. In this respect, for lessons that involve movement skills, the psychomotor domain will be used as a guide in assessing students' performances. Therefore, Simpson's taxonomy of psychomotor domain (Simpson, 1966) has been chosen as a guide for movement skills in this study. However, these aspects must be identified and selected in accordance with the process of teaching and learning via objectives that are going to be implemented because, according to Mohamad Bilal Ali, Baharuddin Aris & Mohd Salleh Abu (2008) and Boon & Leng (2005), the

traditional concept of 'one size fits all' learning methods are no longer appropriate to deal with the demands of sophisticated learning. Yet, according to Baharuddin Aris, Rio Sumarni dan Manimegalai Subramaniam (2002), developing effective multimedia software requires more than the previously mentioned learning aspects. A major transformation is required whereby a combination of various types of multimedia elements is said to improve the quality of the software that is being developed. Typically, most multimedia packages that are available in the market do not incorporate all these elements, rather they only incorporate two or more elements that may be necessary or appropriate (Baharuddin Aris, Rio Sumarni, Manimegalai Subramaniam, 2002). The multimedia elements in question include texts, graphics, animation, sound and video.

The use of multimedia elements such as video in any learning software is said to attract students' attention and that students can easily understand the concept and information delivered. However, some studies suggest that the uses of video is limited and used only in certain sections. This is supported by a study conducted by Brian (2004). Still, the learning process that involves movement skills will become clearer and easier to understand if teaching methods that involve visualization such as videos are used. This is supported by researches conducted by Mohd Arif and Mohd Jasmy (2002), Mohd Jasmy et al. (2002), Wolfgang (2005) and Abang Ismail and Mohd Taib (2007). The use of video has been proven to be able to help improve students' understanding of a particular movement because the video can show the true state of the movement produced.

This study will also include the use of simulations because it offers "life-like learning experience" (Alessi dan Trollip, 2001). Simulation would be very helpful for teaching and learning that involve active movements such as movement skills. Models and realistic approaches are used to teach a concept or complex procedures and analysis of the simulation results. Learning via simulation is akin to learning through quasi-real experience and it can be used for individual or group lessons. According to

Shaharuddin Salleh dan Zaidatun Tasir (2005), multimedia based simulations are a part of the methods in education and are growing in terms of use and popularity. However, according to Kruse (2002), learning via simulation software has several disadvantages; such as lack of attention to content, contents are hard to update and the learning process can only be experienced by one user at a time. Thus, the software that will be developed in this study will focus on several elements that can eliminate its weaknesses and adaptable with everything.

In addition, this research will also attempt to develop multimedia software for learning movement skills that is integrated with video analysis capability to facilitate students through the process of learning minus problems with time constraints. They will also be allowed to explore or review softwares that they have built according to their preferences. The availability of the video analysis element in this learning software will allow the evaluation of movement skills that have been produced and improvements can be included for skills that are not perfect. This is because both the learning and evaluation process should be considered and given due attention. Assessments of movement skills would be inappropriate if conducted only via pen and paper because i) the assessment will not have presented the steps that students must accomplish to perfect their skills and ii) fail to offer information that would enable students to improve their learning process (Julismah et al. 2009). Apart from that, traditional assessments could not determine students' level of confidence in performing the movement skills. Thus, this software is expected to help students improve their confidence level when performing movement skills since they would be able to identify how to execute perfect movements by studying the analyzed videos incorporated in the developed learning software. Incidentally, this software can assist in the learning and assessment processes as well as help students to improve their movement skills performances after using it.

METHODOLOGY

Research Design

A holistic approach that merges both quantitative and qualitative surveys will be employed in this research. By combining these two approaches, it will help to create a better research. According to Neuman (2000), the combined research design used for this type of study can complement the strengths and counteract the weaknesses of each approach. In this study, the quantitative design will be implemented first in order to obtain an overview of the whole ideal. Then, the qualitative data will be used to obtain a deeper insight on the matter.

Hence, surveys will be conducted by distributing questionnaires and interviewing students so as to identify the problems associated with learning movement skills. In order to identify students' performance level in a practical assessment after using this software, a pre-experimental study will be conducted. Next, to identify their level of confidence after using this software, surveys via questionnaires, interviews and observation will also be implemented. Implications of using video analysis for movement skills will be identified by conducting a pre-experimental study, a study of video analyses and interviews. The pre-experimental study will also be used to determine whether there are any significant differences between every practical assessment conducted before and after using the software in this study.

Next, interviews, observations and questionnaires will be used to identify students' proficiency levels for movement skills and how the multimedia software, integrated with video analysis and simulation technology has helped with the level of movement skills based on Simpson's taxonomy of psychomotor domain. In the overall execution, this research will utilize these quantitative and qualitative approaches according to specified phases when analyzing, designing, developing, implementing and evaluating the software. Distribution of the quantitative and qualitative research

design based on the types of data collected is shown in Table 1.

Table 1 Distribution of quantitative and qualitative research design based on data types

RQ	Collected data	Design of quantitative/qualitative study
RQ1	Problems of learning movement skills among students	- Survey via questionnaires - Interviews
RQ2	Students' achievements during practical assessment after using the software	- Pre-experimental study (before and after, for the same group)
RQ3	Students' confidence level after using the software	- Survey via questionnaires - Interviews - Observation

RQ – Research Question

RQ	Collected data	Design of quantitative/qualitative study
RQ4	Significant differences between practical assessments after using the software	- Pre-experimental study (before and after, for the same group)
RQ5	Implication of using video analysis technology for movement skills	- Pre-experimental study (before and after, for the same group) - Study via video analysis (feedbacks from students) - Interviews
RQ6 & RQ7	Proficiency level for movement skills and how the learning multimedia software integrated with video analysis and simulation technology have helped students with their movement skills based on Simpson's taxonomy of psychomotor domain	- Observation - Interviews - Surveys

RQ – Research Question

Research Phases

This research has been distributed into three phases. The first phase involves constructing and distributing research instruments, as well as collecting and processing data to obtain more information on the problems with learning movement skills. The second phase involves the development of a software integrated with video analysis based on information regarding problems with learning movement skills. The software will be developed based on Simpson's psychomotor domain, constructivist learning environment and self-learning via exploration. The third stage involves conducting tests to answer the research questions using a set of instruments. These instruments have been developed and tested before the actual research is conducted. The sequences of this research are depicted in Fig. 1.

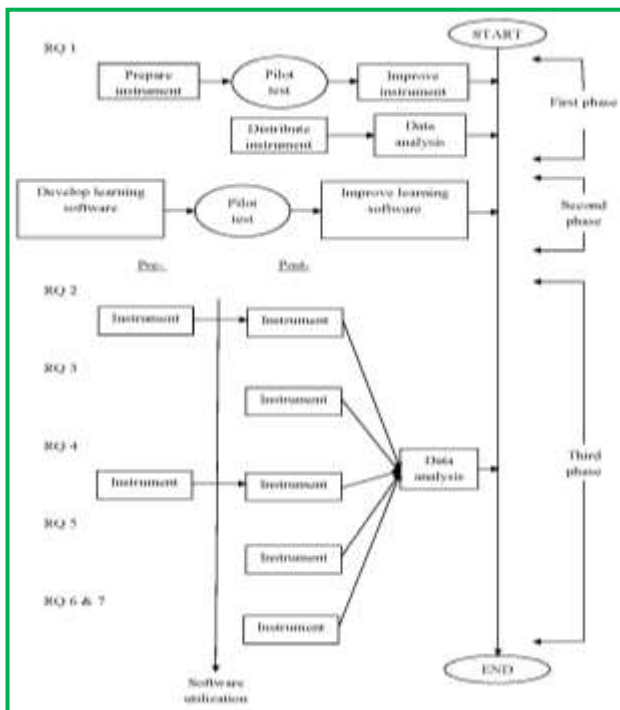


Figure 1 Research Sequence

Sampling

In this study, research samples consisted of Sports Sciences undergraduates who are taking subjects that involve movement skills in sports in one Malaysian university. Apart from that, experts in various fields are also part of the sampling for this study. This includes experts in the fields of technology and experts in the field of sports science.

ANALYSIS OF DATA

Two forms of data have been collected throughout this research; quantitative and qualitative data. Quantitative data will be analyzed using descriptive and inferential methods based on the requirements of the research questions while qualitative data will be analyzed using the constant comparative method. These data will be analyzed based on the research questions as listed in Table 2.

RQ	Collected data	Design of quantitative/qualitative study
RQ1	Problems of learning movement skills among students	- SPSS (Mean & SD) - Content analysis
RQ2	Students' achievements during practical assessment after using the software	- Rubric skills assessment - SPSS (Mean & SD)
RQ3	Students' confidence level after using the software	- SPSS (Mean & SD) - Content analysis - Checklist - SPSS (Mean & SD)
RQ4	Significant differences between practical assessments after using the software	- SPSS (Mean & SD) (Sig value) - (Pearson correlation)
RQ5	Implication of using video analysis technology for movement skills	- Checklist - SPSS (Mean & SD) - Rubric skills assessment - SPSS (Mean & SD) - Content analysis
RQ6 & RQ7	Proficiency level for movement skills and how the learning multimedia software integrated with video analysis and simulation technology have helped students with their movement skills based on Simpson's taxonomy of psychomotor domain	- Checklist - SPSS (Mean & SD) - Content analysis - SPSS (Mean & SD)

Table 2 Data analysis

EXPECTED FINDINGS

The expected outcomes of this research will be very beneficial to all parties, including students, educators, sports bodies and the country. This study is expected to help students in enhancing their proficiencies with regards to movement skills from the theoretical or practical aspects. They should also be able to understand the concept of movements easily and efficiently. In addition, this study also aims to help students improve their confidence level and level

of thinking by utilizing the developed analysis techniques. It is hoped that these students will discover more effective skills that will help them improve their performances.

Results from this study are also expected to assist educators to track and organize their teaching strategies that are suitable with the environment of their students. Educators will also have the opportunity of ensuring that their students' achievements and performances in relation to movement skills will increase and can be effectively mastered.

Additionally, this study is also expected to bring importance to sports bodies as they are expected to produce athletes who are able to achieve success. Via the developed software, it is expected that the knowledge of movement skills can be fully mastered by individuals involved in the field of sports. Hopefully, it may indirectly help the country towards training and nurturing an advanced generation who are in perfect alignment with their progressive environment.

As a conclusion, the findings in this research are hoped to be favorable in order to fulfill the formulated research questions. Moreover, the results of using video analysis and simulation in this future software are expected to help every individual to improve their movement skills to the fullest. It has been the goal of this research to increase a user's skills to the highest level as well as to detect weaknesses in any movement that is being performed. Indirectly, this software is also expected to bring benefits to all parties especially those involved in sports sciences.

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MATHEMATICAL COMPETENCIES IN DESIRED LEARNING OUTCOMES OF ENGINEERING MATHEMATICS CURRICULUM

Soheila Firouzian, Zaleha Ismail & Roselainy Abdul Rahman

ABSTRACT

Recent researches conducted by authors of this paper revealed the importance of mathematical competencies (MCs) for engineers and engineering students. Mathematical competencies refer to individuals' capabilities to apply mathematics in situations where mathematics can play a fundamental role. These situations can be problem solving, numerical analysis, modeling vast number of entities, manipulating sparse matrices, handling symbols and formulas, using technological tools, communicating, modelling engineering systems or creation of new knowledge. This paper aims to present how required MCs of engineers can be addressed in clear and distinct outcomes of an outcome-based engineering mathematics curriculum. To do so, a list of required MCs of engineers has been provided based on the results of authors' previous works. A questionnaire was designed accordingly as the instrument of this investigation. Afterward, 30 mathematics lecturers who had experience teaching engineering students were sampled purposively. They have been queried and informed this research in the form of quantitative survey. Finally, a guideline has been proposed to explicitly consider MCs into learning outcomes of mathematics courses offered in engineering programs at Universiti Teknologi Malaysia (UTM).

Keywords: mathematical competencies, learning outcomes, engineering student

INTRODUCTION

Malaysia, as a developing country, attempts to compete along with other countries in technology and science. Similar to the developed countries, training the engineers is considered as a social requirement and obligation. Over the last half century passed from the independence of Malaysia, the number of industries has been rapidly increasing, leading to a high demand for engineers. There is a lot of expectation to train highly qualified engineers, which is a difficult task. So, Universiti Teknologi Malaysia (UTM) as a premier university for engineering attempts to train qualified engineers. To do so, UTM started to develop and apply an Outcome-Based Education (OBE) model from 2002 to the programs offered by the university.

UTM requires developing the engineering curriculum according to the requirements indicated by the Engineering Accreditation Council of the Board of Engineers, as well as the Malaysia Quality Framework introduced by the Ministry of Higher Education in 2004. According to accreditation policy, engineering graduates should have essential skills, attributes, and capabilities reflected in graduate outcomes specified in EAC Manual. UTM implements its engineering program in a way to meet the objectives stated in EAC and BEM in order to prepare capable graduates. Indeed, this university attempts to enhance capabilities of students in a number of aspects. However, some researchers (Abdul Rahman *et al.*, 2012; Acharya, 2003; Khairiyah *et al.*, 2012; Shahrin *et al.*, 2008) believe that an accurate review should be done on the specification, objectives, and outcomes of programs as well as other supporting resources provided for the requirements of OBE in curriculum in UTM.

Since Mathematics is a significant tool to solve engineering problems (Tran and Nathan, 2013), some research has been conducted on

various issues connected to the students' capability in transferring mathematics to solving engineering or real life problems especially right after their graduation, in workplace arena (see Atman and Cardella, 2005; Hoyles *et al.*, 2002; Kent and Noss, 2002b; Kent *et al.*, 2007). Therefore, the concept of mathematical competency has been shaped and used in many investigations and considerations for engineering educations. Mathematical competency refers to individuals capabilities to apply mathematics in situations mathematics can play a fundamental role (Niss, 2003). An amended set of eight mathematical competencies for the first time was defined by Niss (2003) which were; Thinking Mathematically (THM), Reasoning Mathematically (RM), Problem Handling (PH), Modeling Mathematically (MM), Representing Mathematically (REP), Communicating Mathematically (CM), Symbolism and Formalism language (SAF), and Using Aids and Tools (UAT). These competencies were used later in famous studies such as OECD-PISA in 2009 and in SEFI Curriculum Reforms in years 2011 and 2013.

In recent researches conducted by authors of this paper on the importance of MCs for undergraduate engineering students, it was found that there is a need to consider the MCs in clear and distinct outcomes (PEOs, POs and LOs) of outcome-based engineering mathematics curriculum at UTM (Firouzian *et al.*, 2013; Firouzian *et al.*, 2014). Mathematics courses are important in the engineering curriculum with the approximately fifteen percent credits among offered courses (Firouzian *et al.*, 2012). Engineering mathematics I, engineering mathematics II, engineering statistics, differential equation and numerical methods are the mathematics courses offered in engineering programs in Malaysian public universities. As it is depicted as a sample in Table 1, the mathematical competencies have not been identified explicitly in the defined POs of the current engineering programs in UTM and the only required PO for Mathematics courses is acquiring knowledge (Firouzian, *et al.*, 2013).

Table 1: Mapping of subjects to program learning outcomes of an engineering faculty in UTM

Subjects Offered	Acquire Knowledge	Analysis and Tool	Design	Investigation and Research	Financial & Project Management	Team Work	Life Long Learning	Entrepreneurial and Leadership	Sustainability and Ethical
Core Subjects	PO 1	PO 2	PO 3	PO 4	PO6	PO 7	PO 8	PO 9	PO10
Engineering Mathematics I	1								
Differential Equations	1								
Engineering Mathematics II	1								
Engineering Statistics	1								
Numerical Methods	1								
1: Major Contribution					2: Minor Contribution				

Source: UTM Manual, FKA, 2013-2014

Therefore, previous work by authors of this paper gave insight to the role of MCs and to a comprehensive conceptualization of MCs notion in the intended learning outcomes of mathematics courses in the OBE (Outcome Based Education) programs of engineering education at UTM. The results showed that there is a gap between the university education and workplace demands for mathematical competence of the engineers (Firouzian et al., 2014). Consequently, a list of desired MCs was offered based on a qualitative inquiry done among engineers and engineering lecturers.

This paper answered to this question that how the desired MCs of engineers can be addressed explicitly into outcomes of engineering mathematics curriculum as perceived by mathematics lecturers? As such, in this study a framework for revising the outcome-based

mathematics curriculum of undergraduate engineering programs at UTM from the perspective of desired mathematical competencies is presented. This is followed by suggesting revision of outcomes of mathematics courses according to the recommended guideline by mathematics lecturers. This emphasis is remarkable since we could understand what should be achieved by prospective engineering students at the end of mathematics courses and what they should be able to do after their graduation as the curriculum outputs. The proposed guideline could be also applicable in developing the instructions and assessment methods of the defined mathematics curriculum of engineering undergraduates.

THE STUDY

This research reviewed the outcomes of engineering mathematics curriculum with the aid of Tyler's Objectives-Centered curriculum evaluation theory to see how mathematical competencies can be addressed into curriculum outcomes to meet the stockholders demands. According to Tyler theory of curriculum evaluation, which is one of the pioneer theories of curriculum evaluation, there is a need to revise curriculum whether the objectives (desired outcomes) of the curriculum do not meet the stakeholders' demands; subsequently, new outcomes should be defined with respect to the results of that evaluation. This theory has been recognized by curriculum developers (Jansen, 1998; Lawson and Askell-Williams, 2007; Mahomed, 1996), especially in engineering programs, as a theory associated with OBE. Although OBE approach to the curriculum design is influenced by Spady's emphasis on outcomes, Tyler theory is related directly to the importance of revising the curriculum in regard to outcomes when its necessity is felt (Lawson and Askell-Williams, 2007). Therefore, this theory was used to facilitate this research revising outcomes of the outcome-based engineering mathematics curriculum of three faculties of civil, mechanical and electrical engineering at UTM from the perspective of MCs.

This is while in previously conducted studies such as Alpers (2013b), Cardella (2010), Firouzian, *et al.* (2014), Gainsburg (2006), Hoyles, *et al.* (2002), Kent and Noss (2003), Abdul Rahman *et al.* (2013), Mohamad Yusof *et al.* (2013), SEFI (2013), it is mentioned that acquisition of every mathematical competencies is crucial for engineering students to be competent individuals in their future professions.

The findings of a recent research by authors confirmed that the acquired MCs of engineering students are not in line with the required MCs of engineers at the workplace and with expectation of engineering lecturers as curriculum stakeholders and there is no significant synergy and compromise between them (Firouzian *et al.*, 2014, Mohamad Yusof *et al.*, 2013, Abdul Rahman *et al.* 2012). Necessarily, there will be written outcomes to guide educators and engineering students to be able to step forward with a common aim in terms of what should be attained at the end of the program as desired MCs.

Our study indicated that revising an engineering mathematics curriculum should have some characteristics; firstly, the needs of stakeholders and faculty members those which are desired by engineers and engineering lecturers should be determined explicitly. Secondly, in the first step of outcome-based engineering mathematics curriculum, which is planning for outcomes (PEOs, POs, LOs), the desired MCs as demanded by stakeholders should be developed and be defined. Here is the place that the desired MCs should come to play and be proposed as the main intended outcomes of engineering students. As mentioned earlier, desired MCs are the combination of required MCs of engineers at the workplace and expected MCs of engineering lecturers from students in order to foster them in solving engineering and complex problems that should be in conform to BEM-EAC standards. Thirdly, through the implementation stage, these outcomes should be considered in developing teaching-learning activities so as engineering students have this opportunity to be fostered in regard to acquire those desired MCs and therefore they become qualified engineers in early future as the outputs of

curriculum. Finally, in the assessment stage of outcome-based engineering mathematics curriculum, the instructors should improve the methods of assessment by considering the desired MCs. They should apply those competencies to new formative or summative assessment methods for assessing the acquired MCs of engineering students.

All in all, Figure 2 shows the framework of revising the engineering mathematics curriculum with desired MCs. These desired MCs then can be transferred to the outcomes of mathematics courses in either forms of PEOs POs or ILOs. The final products of processing these factors are those demanded MCs that should to be attained by any engineering student at the end of the bachelor degree so as to be ready to enter the workplaces. Subsequently, such this curriculum can be called a competence-based engineering mathematics curriculum for undergraduate level which includes desired MCs as its outcomes (PEO, PO, LO).

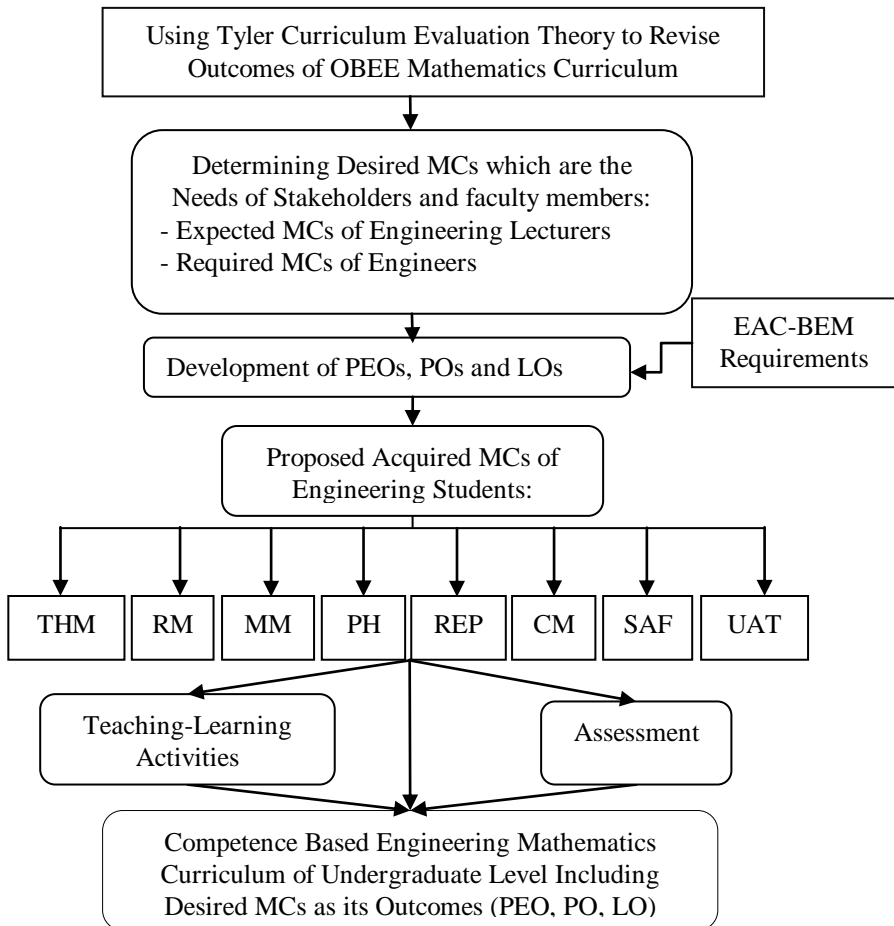


Figure 1: The framework of revising the engineering mathematics curriculum by aid of desired MCs

METHODOLOGY

A survey conducted among mathematics lecturers who were teaching engineering students in three faculties of civil, mechanical and electrical engineering in UTM. Emails of invitations for contributing in

this survey were sent to a list of all those mathematics lecturers. This list of the mathematics lecturers was collected from faculty of science for the matter of data collection with the official permission in hand from faculty of education in Johor campus of UTM. The list consisted of 29 mathematics lecturers and their email addresses; from those lecturers 14 lecturers replied their emails and participated in our study.

The survey questionnaire was online. Link of the questionnaire was included in emails of invitation. Besides, an explanation on what are the definitions of MCs was offered to them; also it was explained to them that their information will be kept confidential. The questionnaire was constructed by authors and had high reliability and validity coefficients. Some biographical questions were asked through the first part of the questionnaire, including lecturers' qualification, their academic position, year of experiences and mathematics courses they have taught. The body of the survey consisted of a table listing the mathematics subjects for per MCs to see whether from their perspective any of MCs (e.g. thinking mathematically) can be fostered via one or more than one mathematics course/s. A column provided to tick which indicates a response: agree, disagree. After completing data collection, the authors moved to the data analysis phase of the study.

RESULTS AND DISCUSSION

We discuss some of the results and implications for the core mathematics subjects, in relation to per MCs. If any subject was selected by the mathematics lecturers in conjunction with any MC, it indicated that the aforementioned course has contribution in fostering the coaccordance competency. Table 2 indicates the demographical information of participants.

Table 2 Demographical information of participating lecturers

	Gender		Academic Position				Teaching Experience			Total
	Male	Female	Professor	Associate Professor	Senior Lecturer	Lecturer	1-9 Years	10-19 Years	20 Years or Above	
Frequency	6	8	2	4	7	1	4	8	2	14
Percent	43	57	14.3	28.6	50	7	28.6	57	14.3	100

Table 3 demonstrates frequency of lecturers' who selected the mathematics courses which have contribution in fostering any of MCs.

Table 3 Lecturers' selection of mathematical courses in fostering mathematical competencies

Mathematics Courses MCs	Core Mathematics Courses Offered in Engineering Faculties				
	Engineering Math I (SSCE1693)	Engineering Math II (SSCE1993)	Differential Equation (SSCE1793)	Numerical Methods (SSCE2393)	Engineering Statistics (SSCE2193)
THM	14	12	13	10	11
RM	10	11	5	8	9
PH	13	12	13	10	4
MM	10	3	10	6	2
REP	12	11	13	4	12
CM	11	5	6	9	11
SAF	13	12	13	11	10
UAT	3	10	12	11	2

As seen in the above table, the gray cells are higher frequency of the lecturers who selected coaccordance courses in relation to fostering any of MCs. For instance, 14 lecturers recognized that thinking mathematically can be enhanced through engineering mathematics I. As another example, only 3 lecturers believed that the competency of using aids and tools can be enhanced through

engineering mathematics I.

To sum up, based on the findings of this study, a comprehensive guideline is suggested to the body of knowledge to consider desired MCs as clear learning outcomes of outcome-based engineering mathematics curriculum. That makes the curriculum parties, including mathematics lecturers and engineering students, aware of the explicit aim of mathematics education of engineers as demanded at the workplace and requirements of engineering courses (as perceived by engineering lecturers). Moreover, there must be coordination amongst Engineering and Mathematics lecturers to identify where should desired MCs be addressed into the outcomes of specific courses. The guideline for mathematics courses based on the results of this survey is presented in Table 4.

Table 3 Guideline for referring desired MCs as the intended outcomes of mathematics courses

Subjects \ MCs	THM	RM	PH	MM	REP	CM	SAF	UAT
Engineering Mathematics I (SSCE1693)	√	√	√	√	√	√	√	
Engineering Mathematics II (SSCE1993)	√	√	√		√		√	√
Differential Equations (SSCE1793)	√		√	√	√		√	√
Numerical Methods (SSCE2393)	√	√	√			√	√	√
Engineering Statistics (SSCE2193)	√	√			√	√	√	

CONCLUSION

According to the guideline provided from the results of this study, clear learning outcomes of desired MCs can be expected from each mathematics core course. These courses which are mathematics engineering I, mathematics engineering II, differential equations, numerical methods, and engineering statistics are common within the three engineering faculties of civil, electrical, and mechanical engineering at UTM. Hence, the aforementioned guideline of desired MCs can be used by these three faculties. This guideline can be also a schema of the possible outcomes in the form of desired MCs which might be effective in fostering the prospective engineering students, needs to be evaluated more accurately. However, a prototype implication is needed to be investigated through the subtopics of each course in future researches. Additionally, this research was done only in the outcomes stage of the outcome-based engineering mathematics curriculum; therefore, it is suggested to review the curriculum to understand how mathematics can be taught through a comprehensive research of MCs in Teaching and Learning stage and Assessment stage of the curriculum with the aspiration of the present research and proper curriculum evaluation theories.

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PEMBELAJARAN BERKONSEPKAN “FLIPPED” MENERUSI AKTIVITI PEMBELAJARAN BERASASKAN PROJEK

Mohamad Azaki Bin Mohamad Kadis & Zaidatun Tasir

ABSTRAK

Kajian ini bertujuan bagi melihat rekabentuk tugas Pembelajaran Berasaskan Projek (PBL) bagi persekitaran pembelajaran luar bilik darjah atau “Flipped Classroom” dan menganalisis corak pelaksanaan PBL kumpulan pelajar berdasarkan tugas. Artikel yang dihasilkan ini membincangkan konsep, prinsip dan pelaksanaan Pembelajaran Berasaskan Projek (PBL) oleh pengkaji-pengkaji terdahulu serta mengambil contoh pembangunan aktiviti atau tugas daripada kajian mereka. Daripada kajian-kajian tersebut didapati, objektif utama pelaksanaan PBL ini adalah untuk memberi pengalaman pembelajaran sebenar kepada pelajar berdasarkan tugas yang direkabentuk. Pelajar-pelajar PBL ini lebih berdikari, memahami kandungan pembelajaran dengan lebih mendalam serta mampu berkomunikasi dan bersosial dengan baik sesama rakan kumpulan dan pihak luar. Selain daripada itu, pengkaji turut membincangkan kaedah pembangunan dan pelaksanaan tugas luar kelas atau “Flipped Classroom” bagi aktiviti PBL yang telah direkabentuk itu. “Flipped Classroom” merupakan kaedah pembelajaran luar kelas dimana pelajar akan menerokai pembelajaran sendiri atau secara berkumpulan dan perbincangan tugas dan aktiviti tersebut dilaksanakan di dalam kelas. Oleh yang demikian, aktiviti dan tugas pembelajaran dapat

dibincangkan dan segala masalah dan persoalan yang timbul boleh dirujuk kepada pensyarah semasa di dalam kelas. Ini memberi lebih banyak ruang perbincangan, saling tukar idea dan komunikasi dua hala antara pelajar dan pensyarah. Penerokaan terhadap tugas luar kelas iaitu gabungan PBL dan “Flipped Classroom” yang dilalui oleh para pelajar ini mempunyai kaitan dengan teori Pembelajaran “Situating” iaitu pembelajaran melalui tugas yang berkaitan dengan aplikasi dunia sebenar dan “Learning By Doing” oleh Dewey. Kedua-dua teori pembelajaran ini mendokong kepentingan pengalaman pembelajaran terhadap pelajar kerana pelajar-pelajar adalah individu yang sentiasa bergerak aktif, beraktiviti dan terdedah dengan pelbagai teknologi dan pengetahuan hujung jari.

Kata kunci : Pembelajaran Berasaskan Projek, Situated Based Learning, Flipped Classroom, Learning By Doing

1.1 PENGENALAN

Abad ke- 21 telah memperkenalkan kita kepada capaian maklumat di seluruh dunia tanpa sempadan. Perkongsian serta saling tukar maklumat yang begitu pantas terutamanya melalui halaman sesawang atau “World Wide Web (WWW) menuntut komuniti pelbagai peringkat untuk menguasai ilmu teknologi maklumat. Bukan itu sahaja, pengenalan kepada alat mudah alih yang semakin canggih telah memudahkan lagi aktiviti harian dilakukan di mana sahaja. Pelbagai peringkat keperluan seperti perniagaan, pembuatan, perbankan, dan banyak lagi aktiviti telah secara aktif menggunakan teknologi canggih ini. Pendidikan juga secara tidak langsung telah menerima tempias daripada kecanggihan teknologi ini. Malah ianya mampu memberikan kelainan terhadap pedagogi di dalam kelas dengan memberi nafas dan wajah baru bagi generasi kini yang kononnya lebih terdedah kepada kecanggihan teknologi dalam pembelajaran (Attwell, 2007). Ini ditambah lagi dengan kepelbagaian gaya pembelajaran pelajar dan kesesuaian mod

pembelajaran mereka di dalam kelas (Takamuku & Arkin, 2007). Oleh yang demikian, sistem pembelajaran seharusnya mengintegrasikan pendekatan pembelajaran yang sesuai agar proses pembelajaran dapat dimaksimumkan. Salah satu pendekatan pembelajaran yang berpotensi diperkembangkan penggunaannya menerusi sistem pembelajaran ialah pembelajaran berasaskan projek.

1.2 LATAR BELAKANG MASALAH

Kaedah pengajaran dan pembelajaran yang kreatif mampu menarik minat pelajar untuk mengikuti kelas dengan lebih fokus. Pembelajaran berasaskan projek menjadi satu kaedah pengajaran yang popular di sekolah, kolej mahupun di universiti. Pendekatan pembelajaran ini, memberi ruang kepada pelajar untuk bertanggungjawab dalam pembelajaran mereka sendiri (Michel, James, Iii, & Varela, 2009). Ini secara tidak langsung membolehkan pelajar aktif dalam proses pembelajaran mereka. Pembelajaran Aktif pula merangkumi pelbagai kaedah pengajaran seperti latihan pendek di dalam kelas, pembahagian kumpulan kecil dalam perbincangan, kuiz dan latihan penilaian sendiri pelajar, permainan, 'role play', lawatan lapangan dan banyak lagi (Bonwell & Eison, 1991; Ebert-May, Brewer, & Allred, 1997; Sarason & Banbury, 2004). Pembelajaran berasaskan projek ini merupakan salah satu pendekatan dalam pembelajaran aktif.

Dalam kaedah pembelajaran berasaskan projek (PBL), lazimnya pelajar akan diberikan tugas luar secara individu atau berkumpulan dan pelajar dikehendaki menyelesaikan masalah yang diberikan dalam tempoh masa tertentu. Oleh yang demikian, rekabentuk projek atau masalah yang ingin diberikan seharusnya bersesuaian dengan tahap intelektual pelajar, merangkumi skop pembelajaran serta memenuhi objektif pembelajaran itu sendiri. Ini adalah penting bagi memastikan pelajar dapat meneroka pembelajaran mereka di luar bilik darjah dan seterusnya memenuhi skop pembelajaran mereka itu sendiri. Kaedah PBL ini tidak sahaja

memberi pengetahuan baru terhadap isi pembelajaran kepada pelajar malah dapat meningkatkan kemahiran generik (*softskill*) atau insaniah pelajar seperti konsep berkumpulan, berdikari, berkomunikasi, menepati masa dan pelbagai lagi.

Pembelajaran masa kini merupakan satu proses yang mencabar, berasaskan masalah sebenar dan menuntut pelajar mengalami sendiri pengalaman. Sekiranya PBL tidak dilaksanakan secara kolektif, pelajar akan terus dalam persekitaran pembelajaran sedia ada di kampus dan mungkin akan gagal bersaing di peringkat yang lebih tinggi atau alam pekerjaan apabila mereka tamat belajar nanti. Projek dan tugas luar yang diberi kepada pelajar semasa pembelajaran berasaskan projek berpotensi mendedahkan pelajar untuk mengalami sendiri masalah dunia yang sebenar dan belajar secara berkumpulan serta berani berkomunikasi dengan pihak luar dalam mendapatkan maklumat dan kandungan pembelajaran mereka.

Oleh yang demikian, kajian terhadap pengurusan pembelajaran berasaskan projek bagi penilaian luar kelas ini dilaksanakan bagi memberi fokus terhadap pengurusan dan reka bentuk penilaian atau tugas yang diberikan kepada pelajar. Ini adalah penting kerana keseronokan pembelajaran luar bilik darjah itu harus seiring dengan objektif yang ingin dicapai oleh pensyarah.

1.3 OBJEKTIF KAJIAN

Objektif kajian ini ialah:

- i. Merekabentuk tugas PBL bagi persekitaran pembelajaran luar bilik darjah
- ii. Menganalisis corak pelaksanaan PBL kumpulan pelajar berdasarkan tugas yang direkabentuk

1.4 PEMBELAJARAN BERASASKAN PROJEK

Pembelajaran berasaskan projek merupakan satu penyelesaian oleh pelajar terhadap artifak luaran dan mewakili masalah umum berdasarkan soalan-soalan yang terbimbing (Rieber, 2004). Ianya merujuk kepada pembelajaran konstruktivis (Kafai & Resnick, 2006). Kaedah pembelajaran ini menjanjikan satu proses pengajaran yang autentik kerana direkabentuk atas dasar minat pelajar (Grantt, 2011). Kebanyakan prinsip pembelajaran berasaskan projek memberi fokus dalam penghasilan dan penyelesaian masalah artifak pembelajaran. Pembelajaran berlaku melalui proses pembinaan artifak dan ianya kritikal dalam mencapai matlamat pembelajaran (William van Rooij, 2009). Kaedah pendekatan pembelajaran ini, adalah pembelajaran berpusatkan pelajar yang mana pelajar akan bertanggungjawab terhadap pembelajaran mereka dan guru atau pensyarah akan bertindak membantu mereka sebagai fasilitator pembelajaran dalam meningkatkan pengetahuan pelajar secara mendalam terhadap sesuatu topik pembelajaran. Kesan yang akan dilihat terhadap pelajar amat besar. Ini adalah kerana pembelajaran berasaskan projek memberi pengalaman sebenar terhadap kandungan pembelajaran.

Oleh yang demikian, pendokong kepada konsep pembelajaran ini menekankan bahawa kesan pembelajaran penerokaan adalah jauh lebih baik daripada menghafal kandungan pembelajaran di kelas (Harris & Katz, 2004) Konsep pembelajaran berasaskan projek ini telah banyak digunakan dalam kaedah pengajaran dan pedagogi seperti projek berasaskan Sains (Marx, Blumenfeld, Krajcik, & Soloway, 1997), Persekitaran Pembelajaran terbuka dan tertutup (Hannafin, Land, & Oliver, 1999), "*disciplined inquiry*" (Levstik & Barton, 2001), WebQuests (Dodge, 1998), Persekitaran pembelajaran berpusatkan pelajar (Land & Hannafin, 2000) dan banyak lagi. Namun begitu, rekabentuk pelaksanaan pembelajaran berasaskan projek ini amat mencabar. Kaedah ini, dianggap tidak efisien dalam persekitaran pembelajaran kompetitif kerana memerlukan masa yang panjang dalam perlaksanaannya (Clark,

2006; Grant & Hill, 2006). Peranan fasilitator, guru, pensyarah dan malah pelajar juga perlu berubah daripada persekitaran pembelajaran deduktif (Clark, 2006; Grant & Hill, 2006). Malah Mitchell et al. (2009) mencadangkan agar gabungan atau kaedah “hybrid” digunakan dalam pelaksanaan pembelajaran berasaskan projek ini dengan pengajaran di dalam kelas agar objektif, produk atau hasil pelajar adalah seperti yang dikehendaki. Oleh yang demikian tugas yang bersesuaian dengan persekitaran pembelajaran perlu direkabentuk agar aktiviti tidak hanya berfokuskan penilaian sumatif (Barak, 2005) semata-mata, malah penilaian formatif (Helle et al., 2006) perlu diterapkan agar pelajar mencapai objektif pembelajaran mereka.

1.5 TUGASAN LUAR BILIK DARJAH: “FLIPPED CLASSROOM ASSESSMENT”

Pembelajaran luar bilik darjah atau “flipped classroom” merupakan satu pendekatan dalam mengubah kaedah pembelajaran tradisional iaitu belajar di dalam bilik darjah kepada pembelajaran di luar bilik darjah iaitu belajar di rumah. Kaedah pembelajaran ini, menuntut penyediaan bahan secara atas talian yang boleh dicapai oleh pelajar di luar kelas (Lage & Platt, 2000) iaitu di rumah mahupun asrama mereka. Pendekatan ini merupakan kaedah pembelajaran bercampur atau “blended learning”. Kaedah konvensional menuntut pembelajaran di dalam kelas dan tugas diberikan untuk disiapkan di rumah, namun dalam kaedah ini, pelajar dikehendaki mengikuti kandungan pembelajaran di rumah dan melaksanakan perbincangan tugas dan aktiviti di dalam kelas (Baker & Mentch, 2000). Selain daripada itu, penyediaan bahan tugas secara atas talian membolehkan pelajar membuat perbincangan dengan rakan kumpulan mereka dengan bantuan pensyarah atau guru di dalam kelas kelak. Dengan kaedah pembelajaran luar bilik darjah ini, “engagement” antara kumpulan pelajar dan pensyarah akan lebih dekat. Panduan dalam menyiapkan tugas akan menjadi lebih

teratur, lebih banyak perbincangan antara “peer” dan pelajar mendapat bimbingan yang lebih fokus dan seterusnya mencapai objektif tugas dan menguasai pembelajaran dengan lebih mendalam (Sankey & Hunt, 2013). Komponen utama di dalam pelaksanaan model pembelajaran luar bilik darjah ini adalah perancangan aktiviti pembelajaran dan dibantu oleh teknologi pendidikan dan seterusnya menggalakkan budaya dan suasana pembelajaran yang menarik (Stayer, 2007). Model pembelajaran ini, menggunakan teknologi sebagai medium demonstrasi dan penerangan tugas secara atas talian. Guru akan bertindak sebagai fasilitator pembelajaran yang mana akan membimbing pelajar secara individu, menjelaskan tugas dan menawarkan bantuan secara terus sekiranya diperlukan. Rakan-rakan kumpulan akan bekerja bersama-sama menyelesaikan tugas dan projek yang diberikan serta melibatkan diri dalam perbincangan yang lebih berkualiti.

1.6 REKABENTUK TUGASAN LUAR BILIK DARJAH

Perlaksanaan tugas luar bilik darjah perlu dirancang dan direkabentuk dengan teliti agar objektif pembelajaran dapat dicapai oleh pelajar dan meningkatkan keupayaan pemikiran aras tinggi atau *Higher Order Thinking* (HOT) pelajar. Kandungan bahan pengajaran disediakan melalui video atas talian, capaian bahan e-pembelajaran, carian bahan internet dan lain-lain. Guru yang bertindak sebagai fasilitator pembelajaran akan meminta pelajar melayari dan mencapai kandungan pembelajaran sebelum kelas sebenar bermula. Pelajar akan lebih bermotivasi kerana ingin mengetahui dengan lebih lanjut aktiviti yang akan dilaksanakan pada kelas sebenar. Tugas-tugas penyelesaian masalah berbentuk kajian kes yang umum mungkin boleh diberikan kepada pelajar atau kumpulan pelajar. Kajian kes akan dibincangkan di dalam kelas dan kesimpulan akan diberikan hasil daripada pembentangan setiap kumpulan. Ini menunjukkan kelas merupakan satu lokasi perbincangan pembelajaran melalui tugas-tugas awal yang

diberikan. Ini berbeza dengan kaedah konvensional dimana pelajar hanya mendengar kandungan pembelajaran dari pensyarah di dalam kelas dan membuat latihan sendiri di rumah atau di asrama. Dengan rekabentuk tugasan yang betul, keterujaan pelajar terhadap pembelajaran itu akan meningkat dengan sendirinya dan pelajar akan bermotivasi tinggi serta bersemangat untuk berkongsi idea, pengalaman dan pengetahuan mereka dengan rakan-rakan sekelas.

1.7 “SITUATED LEARNING THEORY”

“Situating Learning” merupakan salah satu kumpulan daripada teori pembelajaran atau strategi pedagogi pembelajaran (EduTech Wiki, 2014) sama juga seperti teori konstruktivisme-sosial. Pembelajaran berasaskan projek mempunyai kaitan dengan Teori Pembelajaran “Situating” kerana “Situating Learning” biasanya melibatkan tugasan berkaitan dengan aplikasi dunia sebenar. Tujuan utama kaedah pembelajaran ini adalah untuk meningkatkan mutu pembelajaran dengan memotivasi pelajar dan penyediaan persekitaran pembelajaran yang berkualiti. “Situating Learning” menekankan aplikasi dan konteks pengetahuan berbanding pembelajaran dengan menghafal fakta semata-mata (Heeter, 2005). Selain daripada itu, konsep pembelajaran “learning by doing” lebih diminati oleh pelajar kerana pelajar-pelajar adalah individu yang sentiasa bergerak aktif, beraktiviti dan terdedah dengan pelbagai teknologi dan pengetahuan hujung jari. Kaedah konvensional “chalk and talk” adalah tidak sesuai sama sekali kerana maklumat tersebut hanya boleh dicapai melalui capaian internet sahaja. Konsep pembelajaran “learning by doing” ini juga merupakan satu pendekatan yang telah lama diperkenalkan. Idea ini telah diperkenalkan oleh Dewey sejak tahun 1897. Beliau percaya pelajar seharusnya diberikan peluang untuk menerokai persekitaran dan pengalaman pembelajaran mereka sendiri. Oleh yang demikian, “situating learning theory” dan “learning by doing” menekankan kepentingan terhadap aktiviti pelajar di luar kelas. Penerokaan terhadap aktiviti atau projek yang

direkabentuk memberikan pengalaman dan seterusnya menjadikan satu kaedah di mana pembelajaran akan berlaku secara tidak langsung. Selain itu, aktiviti sosial dan kolaboratif antara rakan kumpulan akan berlaku sepanjang tugasan. Pelajar akan terdedah dengan komunikasi tidak hanya dengan rakan mereka, malah dengan pihak luar dan menjadikan pengalaman pembelajaran yang lebih menarik.

1.8 METODOLOGI KAJIAN

Kajian ini akan mengambilkira penglibatan pelajar-pelajar Diploma Pengurusan Logistik Bersepadu yang mengambil kursus Pemodelan dan Simulasi pada semester empat pengajian mereka. Populasi melibatkan keseluruhan pelajar yang mengambil kursus tersebut pada dua semester kajian dan dibahagikan kepada kumpulan-kumpulan kecil. Kaedah persampelan rawak mudah akan digunakan dalam pemilihan sampel kajian. Di dalam menentukan saiz sampel yang ingin diambil, jadual penentuan saiz sampel Cohen (1992) akan digunakan berdasarkan kelas semasa kajian ini dilaksanakan. Penentuan saiz sampel Cohen sesuai kerana ianya mengambil kira asas kesignifikanan dan ralat persampelan. Dua pendekatan pengumpulan data akan dilakukan terhadap populasi kajian. Kajian kualitatif berasaskan kajian kes secara kolektif menjadi panduan dalam melaksanakan kajian ini. Kajian kes secara kolektif ini dapat meningkatkan kefahaman kajian terhadap sesuatu teori atau membina teori dari konteks yang lebih luas (Chan, 2011). Manakala kajian kuantitatif dilaksanakan dengan membangunkan soal selidik terhadap populasi kajian dan menggunakan Model Rasch. Ini adalah kerana Model Rasch mengambil kira kebolehan dan kemampuan responden yang menjawab soal selidik, ujian atau instrumen disamping kesukaran item bagi setiap ujian atau item kajian (Rasch, 1980). Model Rasch mampu mengira skor setiap responden dalam bentuk data selang walaupun item ujian dibangunkan menggunakan skala Likert (Rosseni Din et al, 2009). Pengurusan tugasan dalam

pembelajaran berasaskan projek dilaksanakan dengan pembangunan sistem maklumat pengurusan tugas PBL. Kesan penggunaan pengurusan maklumat tugas terhadap kualiti penyelesaian tugas yang diberi akan dianalisis melalui kaji selidik, temubual, pemerhatian, dokumen tugas dan video tugas yang akan dilakukan kepada setiap kumpulan pelajar.

Analisis data secara triangulasi akan dilaksanakan bagi menyepadukan pelbagai kaedah pengumpulan data supaya kesahan data yang dikumpul dapat dipertingkatkan (Othman, 2011). Data-data yang telah dikumpulkan akan diproses menggunakan bantuan perisian seperti SPSS dan juga NVivo.

1.9 JANGKAAN HASIL KAJIAN DAN KESIMPULAN

Daripada analisis yang dilaksanakan, kajian ini diharap dapat memberi maklumat berkaitan pengurusan pembelajaran berasaskan projek yang lebih sistematik dan tersusun. Ini adalah kerana, proses pembelajaran berasaskan projek dan dibantu dengan rekabentuk tugas luar bilik darjah memberi fokus kepada pembelajaran berpusatkan pelajar. Oleh yang demikian, satu sistem pemantauan yang sistematik perlu digunakan agar pembentukan pembelajaran berasaskan projek ini dapat dilaksanakan dengan baik dan mencapai objektif pembelajaran tersebut. Selain daripada itu, rekabentuk tugas luar bilik darjah dapat dihasilkan bersesuaian dengan keperluan dan tahap pembelajaran aras tinggi pelajar atau “HOTS”. Sistem pengurusan tugas luar kelas dapat membantu guru, pensyarah dan fasilitator dalam pemantauan terhadap hasil tugas pelajar pada satu titik masa tertentu. Pada titik tersebut, fasilitator dapat memberikan pendapat, cadangan, pandangan malah memperbetulkan konsep pembelajaran melalui tugas yang diberi sekiranya pelajar lari daripada objektif utama tugas dan pembelajaran. Dengan sistem pengurusan ini, matlamat pengajaran dan pembelajaran berasaskan projek dan berpusat kepada pelajar ini dapat dilaksanakan dengan sistematik dan mencapai matlamatnya

iaitu pelajar bertanggungjawab terhadap pembelajaran mereka. Selain daripada itu, corak pelaksanaan tugas oleh pelajar juga diharap lebih tersusun, mematuhi masa dan tidak melaksanakan tugas di saat akhir, yang mana akan menghasilkan tugas yang tidak berkualiti. Dengan yang demikian motivasi dan persepsi pelajar akan sentiasa positif dalam melaksanakan tugas yang diberikan oleh guru dan pensyarah mereka. Dengan itu, tugas secara berkumpulan ini juga dapat dilaksanakan secara kolaboratif tanpa ada istilah menumpang di dalam tugas. Apabila setiap ahli kumpulan melaksanakan tugas secara bersama, kandungan tugas akan mencapai objektif pembelajaran yang digariskan seterusnya prestasi di dalam tugas tersebut dalam diaplikasi di dalam ujian-ujian individu kerana setiap ahli kumpulan merasai pengalaman pembelajaran yang sama.

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PROCRASTINATION AMONG UNIVERSITY STUDENTS OF MALAYSIA AND PAKISTAN

Azlina Mohd Kosnin, Muhammad Umar Khan

ABSTRACT

Procrastination is a widely noted global human problem affecting people from all spheres of life especially the academic one. Many studies have been done in Western and Individualistic countries but there is an evident lack of research in Asian and collectivistic countries such as Malaysia(MY) and Pakistan(PK). This study explored the prevalence of procrastination in university students of Malaysia and Pakistan and 200 students from two (one Malaysian, one Pakistani) universities took part in it. Tuckman's procrastination scale was used and it was found that participants from both countries had very similar percentage of students falling into different severity levels of procrastination. The percentage of mild procrastination was 19%(PK) to 21%(MY), moderate procrastination was found in 70%(PK) to 67%(MY), whereas 11%(PK) to 12%(MY) of participants were found to be having severe procrastination. Further exploration of this phenomenon of procrastination in Asian and collectivistic milieu, and provision of support services especially for students with severe procrastination, has been suggested.

Keywords: Procrastination, University Students, Malaysia, Pakistan

INTRODUCTION

Procrastination can be defined as the intentional delay of an important task in the favor of an unimportant and trivial task in order to avoid doing the important task. Delaying the important task usually causes hindrance in its completion and makes the person become less productive than they can otherwise be. (Wolters and Corkin, 2012).

Procrastination can be found in many aspects of one's life and it is quite pervasive phenomenon in terms of its affect on different strata of people. Nonetheless, during the course of this study the focus would be on procrastination that is present in a student of higher education during their studies. Such procrastination among student population is sometimes denoted as academic procrastination (Steel, 2007) but here in this article, the word procrastination would be used synonymously with academic procrastination. This is so because many researchers have not made any distinction in referring to general procrastination and academic procrastination while studying it among students (Tuckman, 1991; Steel, 2011). Procrastination has been widely studied in university students and it has been found that it can lead to a lot of undesirable consequences. Emotional disturbance and poor academic performance are its most common outcomes. Increased unease, burden and illness are linked to procrastination (Steel, 2007, 2011).

Studies suggest that procrastinators not only tend to perform poorly than non-procrastinators but also experience poorer health, higher levels of stress and fatigue, mild depression, anxiety, and lower self esteem; all affective attributes that may impact the learning experience (Wolters and Corkin, 2012). Following are some of the results of procrastination of university students; incomplete assigned tasks, cramming instead of understanding the subject matter, social and/or test anxiety, employment of self crippling strategies, poor achievement, dread of failure, distressed mental health (Dewitte and Schouwenburg, 2002).

Data from multiple countries suggest that between 50% and

95% of college students procrastinate on a regular basis (Steel and Ferrari, 2013). Ellis and Knaus have also reported a similar estimate in 1977. Steel (2007) suggested that nearly everyone procrastinates to some degree. The rate of severe or serious procrastination among tertiary level students has been reported to be 32 to 24 % in the western countries (Burka and Yuen, 2008; Costa *et al.*, 2009; Day, Mensink, and O'Sullivan, 2000; Steel and Ferrari, 2013; Steel, 2011).

However there still is a need to assess the rate of procrastination among university students of Malaysia and Pakistan because of two reasons. First is that there is a dearth of studies regarding in issue in the Asian collectivistic milieu (Klassen and Kuzucu, 2009) and the second reason is that the percentage of heavy or extreme procrastinators, needing immediate help, is not readily available as Hussain and Sultan (2010) have argued that such studies are virtually nonexistent in Pakistani context. Side by side Komarraju, Karau, and Ramayah (2007) have found a similar state of affairs in Malaysia. Both Malaysia and Pakistan share a lot of characteristics. Both countries share a history of being a British colony. Both model their higher education system on British higher education system. Both countries are multiethnic collectivistic Asian countries. Both use English as the medium of instruction in most of the higher education institutions (Encyclopædia Britannica, 2009). Although there are many differences between the two countries but still we deemed them similar enough to compare and contrast the obtained data owing to the aforesaid evidences. The likelihood of procrastination mostly corresponds with age, gender, geographical location, education and marital status. Most commonly the procrastinators are unmarried and young men who do not possess high education and live in such countries that have a poor overall self-discipline. It is to be noticed that procrastination has a linkage between education and sex, hence this further endorses that men academically lag behind women (in higher education) due to less skills for self-regulation (Steel, 2007, 2011).

However, most of the aforesaid procrastination studies

have been executed in the western/northern and individualistic countries (Ozan Gundogdu, Bay, and Celkan, 2012; Steel and Ferrari, 2013) and data from more eastern/southern and collectivistic countries is very limited. Moreover, data from Malaysia and Pakistan is especially scarce with respect to the knowledge about the profile of a procrastinator (Hussain and Sultan, 2010; Komarraju *et al.*, 2007). This gap in the international research literature should be addressed by researchers from such countries and the present study is aiming to do so. The primary aims of the current study include investigating the level of procrastination among university students of Malaysia and Pakistan (Asian collectivistic countries). Here, the different percentages and severity levels of procrastination will be shown. Then the issue of different settings and a rough estimate of the prevalence of procrastination will be explored. Although such a study with limited data cannot predict the prevalence rate of any problem in a society or culture. But still, some rough estimates can be drawn. And although stress is not being considered directly as a variable of interest in the current study but maybe severity of procrastination may indirectly show some hint in this regard as stress has been shown to coincide with procrastination (Wyk, 2005). Moreover, it has been assumed that there would be more similarities than differences found between the sets of data from Malaysia and Pakistan because both countries have more cultural and environmental factors similar and the differences between the two countries are not much pronounced on many a dimensions (Encyclopædia Britannica, 2009; Hofstede *et al.*, 2010). Hence, this study aims to demonstrate whether our hypothesized Asian (collectivistic) perspective is similar as assumed or does this categorization not get supported by the data.

METHOD

Instrument

Tuckman's procrastination scale was used in this study to measure procrastination among university students (Tuckman, 1991). It is a 16 item scale and responses on are given on a 4 point Likert type scale ranging from 1 to 4. Maximum scores can be 64 and minimum 16. Higher scores mean higher procrastination level. A score below 20 means absence of procrastination and the person is among 'non procrastinators'. Scores in the range of 21 to 32 mean that there is mild procrastination and the person is among 'not serious procrastinators'. Scores in the range of 33 to 47 mean that there is ample procrastination present and the person is among 'procrastinators'. Scores that are 48 or higher mean that there is a seriously significant level of procrastination and the person is among 'serious procrastinators'. This level of procrastination may be damaging to the study life of the person (Tuckman *et al.*, 2008). The scale was used in its original form in English language as the participants were university students with English as their medium of instruction. The alpha reliability coefficient of 0.79 was obtained in the present study.

Participants

The current study had 200 participants (81 males, 119 females) who were students of two public sector universities of Malaysia and Pakistan. The Malaysian university is located in the state of Johor and Pakistani university is from Punjab province and Faisalabad district. Out of these total participants, 100 (43 males, 57 females) were from Malaysia and 100 (38 Males, 62 females) were from Pakistan. The mean age of the participants was about 23 years. Those university students who volunteered to fill in the research instrument were taken as participants of this study.

RESULTS

The results of this study show that the students of both Malaysia and Pakistan are affected by procrastination in almost equal proportions. Moreover, this proportion is almost comparably similar in both countries and across gender. One more thing to note here is that there was no one found absolutely free from procrastination in both countries. The gender differences between participants were quite negligible i.e. not more than 5% at any severity level and at both within and between the two countries except at moderate procrastination severity where the gender disparity has been found to be about 10% within Malaysian participants.

Table 1(a) Percentage of Pakistani and Malaysian students and levels of their procrastination severity

	Pakistani	Malaysian
Non Procrastinators	0%	0%
Not Serious Procrastinators	19%	21%
Procrastinators	70%	67%
Serious Procrastinators	11%	12%

Table 1(b) Gender wise percentage of Pakistani and Malaysian students and levels of their procrastination severity

	Pakistani		Malaysian	
	Males	Females	Males	Females
Non Procrastinators	0 %	0 %	0 %	0 %
Not Serious Procrastinators	15.8 %	21.0 %	16.3	22.8 %
Procrastinators	71.1 %	69.4 %	74.4	61.4 %
Serious Procrastinators	13.2 %	9.7 %	9.3	14.0 %

The dispersion of students, as per their level of severity, can be seen evidently in the tables 1(a), 1(b) and in figure 1.

One of the most significant points to note here is that there

were about 11 to 12 percent of students found suffering from severe form of procrastination. Students suffering from severe procrastination should seek professional help as per Tuckman *et al.* (2008). Vast majorities (67-70%) of students from both countries moderately procrastinate and few (19-21%) are mild procrastinators.

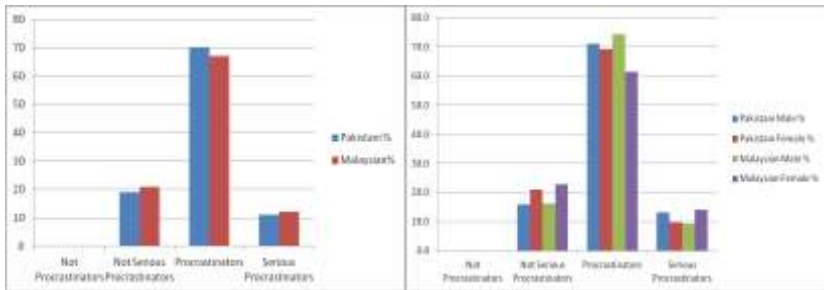


Figure 1 Bar charts showing the dispersion of university students according to their levels of severity, country and gender.

CONCLUSION

The results found in this study are quite similar to those reported in other studies across the globe (Steel and Ferarri, 2013). Most of the student procrastinate and this study has found that 100% of the students procrastinate to some degree and this statistic is comparable to the one put forth by Steel (2007) in his meta analysis where he reports this statistic to be close to 95%. Mild and sever procrastinators both have been found to be a minority as compared to the moderate procrastinators. Moreover, the number of students who are affected by serious procrastination is a bit lower than what has been suggested by other studies as Steel has noted the number of serious procrastination to be about 20%. In our study we found that about 11% of Pakistani students and 12% of Malaysian students suffer from sever procrastination. Albeit lower than other

countries, but 10% is still a big number when we consider them from the perspective of extending institutional support to them. It was noted that there was no specialized support program for such students suffering from severe procrastination in either of the universities from where the data was collected (i.e. Malaysian and Pakistani). Then another thing that needs to be underscored is that the number and dispersion of university students affected by different severities of procrastination were found to be in really close proximity. This can mean that the two Asian countries Malaysia and Pakistan are more similar in their culture and student habits supporting the similarity notion we hypothesized. Plus this study begs for more studies to be conducted regarding procrastination and its support arrangements in collectivistic Asian countries especially Malaysia and Pakistan.

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MOBILE LEARNING IN MALAYSIA

Rozita Abdul Jalil, Zaidatun Tasir

ABSTRACT

An increasing number of mobile usage, make more demand for the development of mobile application. Educators need to strive and explore the potentials of mobile technologies to fulfill learning need. Today, mobile learning has become a strategic topic for many organization specifics concerned with education. This paper discussed the current top mobile operating system in the market with the aims to facilitate developers to make the right choice before any development initiated. Specifically, the paper is focused on mobile learning in Malaysia setting explore government support and education aspiration. Follow with a brief review of selected research studies, conduct on technologies acceptance and readiness of Mobile Learning in Malaysia. Its aim, these findings may provide insights for researchers and educators into future research.

Keywords: mobile learning, m-learning, mobile operating system, acceptance, readiness

INTRODUCTION

Now days, mobile and wireless technologies are the fastest growing areas of technology. It offers an opportunity for learners to transcend the knowledge through accessing alternative source of information. Pocket size minicomputer; can be carried around easily;

increases the pace and scale of attempts to innovate learning and teaching process. Through innovative technologies, one can develop learning applications, which will lead to a new learning model that offers people the opportunity to learn at anytime and anyway. A new era of mobility in learning can be achieved nowadays by using a mobile device, such as cell phones, tablet computers and smartphones.

Research on mobile learning has expanded significantly and these developments encourage educators and researchers to develop educational applications for mobile devices to support any teaching and learning, (Kukulska-Hulme & Traxler, 2007). However, a few aspect to consider before developing any mobile learning is to know the market demand, local environment support, user readiness, education setting, security, appropriate learning strategies, and many more. Therefore, this work aims to provide a current analysis on market trend of mobile operating system and the mobile technologies acceptance and readiness among students and educators. Therefore, a research on mobile learning in Malaysia context should be explored.

This paper has had five sections organized as follows. Section 1, Introduction, in section 2, mobile learning definition. Section 3, explore on the mobile operating system market (worldwide and Malaysia). Section 4 is an overview of mobile learning in Malaysia with a further look on government policy and selected research of technology acceptance and readiness and Section 5 is a conclusion.

MOBILE LEARNING

Mobile Learning has become more important in 21st century (Hwang & Tsai, 2011; Wu et al., 2012). Previous researcher has been conducting studies on the use of mobile technologies in education, where these technology-supported learning approaches recognized as Mobile Learning by researchers (Hwang & Tsai, 2011). Different

researcher and organization give the different definition of mobile learning. A commonly accepted definition of mobile learning (M-learning) is using mobile technologies to facilitate and promote learning anywhere and at any time' (Hwang & Tsai, 2011).

M-learning is a powerful approach to enhance learning experiences and engage learners by different learning situation. These few definitions share the same idea on how it applied in learning activities either classroom setting or any field. It becomes the current trend in future learning.

MOBILE OPERATING SYSTEM MARKET

There are boost number of mobile devices, which create intense competition among operating system developers. Companies such Apple, Microsoft keep promoting in order to remain sustain and capture the majority of market share. The developer needs to determine the target Operating System (OS) platform for mobile learning. The market share visual presentation can provide the overview of the current trend of mobile operating system (m-OS). Figure 1 displays of top eight m-OSs' worldwide market share from year 2011 to 2014. The results show that Android and iOS clearly lead the table. Android conquer more than 40% of market share follow by iOS with 24%, and remaining SymbianOS, Samsung, Blackberry OS, Windows Phone and others. The graphic line display trend of the market is constantly changing and evolving throughout the year.

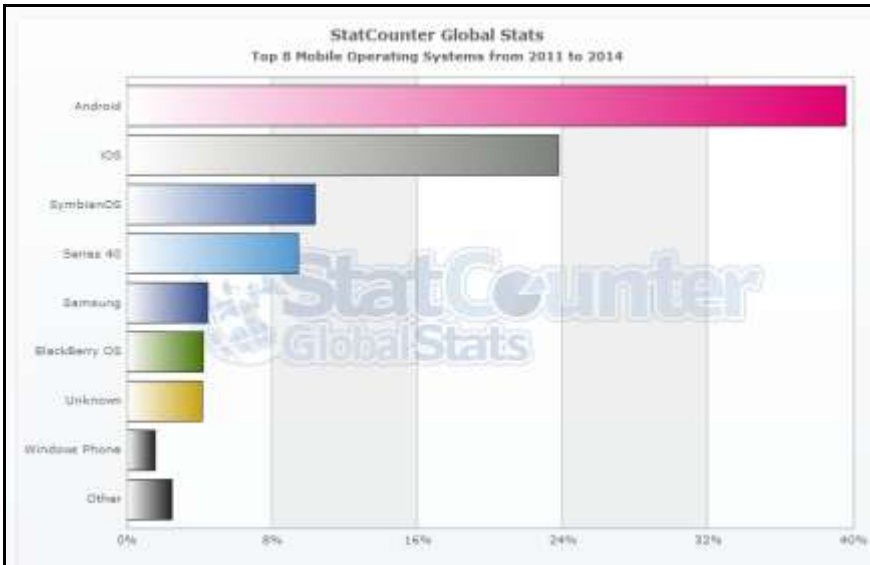


Figure 1 Mobile Operating System Worldwide from 2011 to 2014
(source :StatCounter Global Stats)

Figure 2 presents the top operating system in Malaysia from year 2011 to 2014. The statistics show that Android leads the way, monopolized more than 60% of market share in Malaysia followed by its rivals iOS, Symbian OS, Sony Ericson, Series 40, Blackberry and others. Nevertheless, the evolving of technologies with new features give chance for the m-OSs' in low rated position to climb the top. Based from the previous figures, the most promising mobile OSs in Malaysia are Android follow by iOS. Both two m-OSs' to consider for any development of mobile learning in Malaysia.

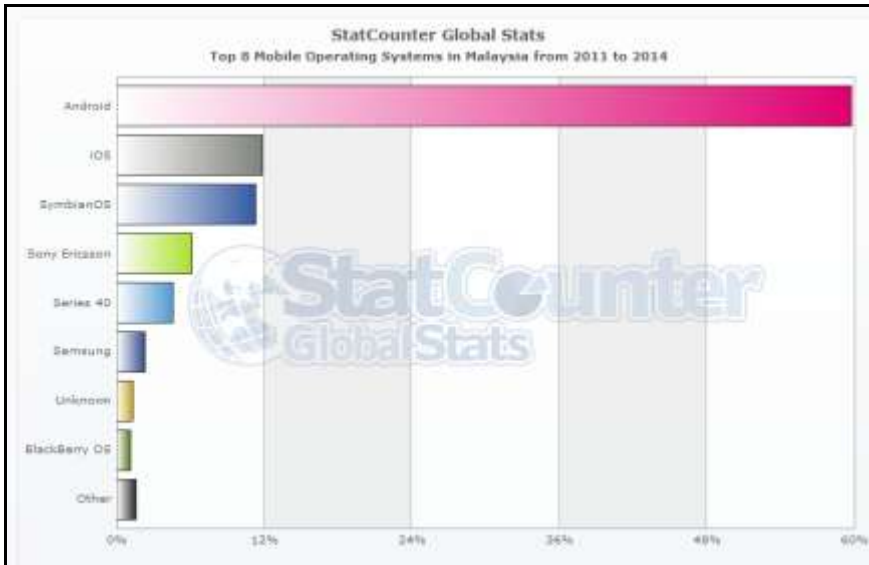


Figure 2 Mobile Operating System in Malaysia from 2011 to 2014
(source :StatCounter Global Stats)

MOBILE LEARNING IN MALAYSIA

Overview Of Government Effort

Ministry of Education (Malaysia) translates the future direction of government effort and aspirations to become competitive nation by documented National Higher Education Strategic Plan (PSPTN) 2007-2020. Ministry of Education (MOE) has developed 21 Critical Agenda Projects (CAPs) to monitor progress PSPTN stages. Each of these CAPs has three main items (strategic objective, indicator, target) to be achieved through various planned activities. Mobile learning has been spot as one of CAPs and key Result Area (KRA) of MoE. In the context of developing country like Malaysia, using portable technologies as learning enhance technologies often remain unrealized.

Malaysia Education Blueprint 2013-2025 is a new document by MOE on context of raising international education standards. This Blueprint written 11 strategic and operational shift of a vision of the government's aspiration of better preparing education system with consider student both needs and deserves. "Leverage ICT to scale up quality across Malaysia" in Shift 7, positively encourage the mobile learning technologies to grow. Therefore, a brief discussion of some selected research studies on technologies acceptance and readiness Mobile Learning in Malaysia is relevant here.

TECHNOLOGIES ACCEPTANCE AND READINESS

Article searching was conducted from computerized bibliographic databases Scopus and ISI Web of Knowledge. There are six studies met the selection criteria, acceptance and readiness Mobile Learning in Malaysia context. The results of the analysis are simplified and presented. More syntheses and organized item-based information (including research focus, participant information, methodology, research outcomes) are provided in Figure 3.

No	Study	Research focus	Participant	Methodology	Outcome	Details
1	Ismail, I. et al. (2013)	Teachers' acceptance and readiness of mobile technologies	38 teachers, teach information and Technology (IT) subject from different primary schools in Penang, Malaysia	questionnaire survey	positive acceptance	-Teachers' readiness for the use of mobile phone in T&L was found to be at a considerably low level -Gender is a possible factor influencing the respondents' readiness.
2	Krish, P., et al. (2013)	The readiness of students in mobile learning	81 student undergraduate and post graduate students: two local universities, University of Technology MASA and Universiti Kebangsaan Malaysia	online questionnaire survey	positive	- The students are highly familiar with computing skills positively welcome the integration of mobile learning in education.
3	Hamat, A., Embi, M.A., Hassan, H. A (2012)	The readiness of UKM lecturer in mobile learning	374 lecturers in Universiti Kebangsaan Malaysia	online questionnaire survey	positive	-The majority (85.7%) respondent believe that mobile learning would be useful for their students
4	Rahmat, R. et al. (2011)	The students' readiness and perceptions towards the use of mobile technologies in learning	235 student aged 16 years old (Form4) of six daily schools in Seremban, Negeri Sembilan.	questionnaire survey	positive	-The participants displayed readiness and positive perceptions toward using mobile technologies for learning
5	Peng, C.L., et al. (2010)	The readiness of OUM students in mobile learning	OUM student	questionnaire survey	positive	-The majority of respondents would be ready for mobile learning within six months of the study.
6	Poon, W. C., Koo, A. C. (2010)	The readiness of students in universities mobile learning	Student in six universities in Malaysia	questionnaire survey	positive	-Most respondent prefer online learning and willing to try out m-learning.

Figure 3 Analysis of selected studies on technologies acceptance and readiness Mobile Learning in Malaysia

Two studies investigate on educator acceptance and readiness of mobile technologies (Ismail, I. et al., 2013; Hamat, A., Embi, M.A., Hassan, H. A. 2012), while four others research focusing on student readiness of Mobile Learning (Krish, P., et al., 2013; Rahmat, R. et al., 2011; Peng, C. L., et al., 2010; Poon, W. C. & Koo, A. C., 2010). All of the studies were conducted using questionnaire survey and surprisingly gave the positive outcomes.

The findings support some insights to teachers and students so that they can employ suitable approaches and integrate mobile technologies in teaching and learning. In addition, the findings also support the implementation of mobile learning in Malaysia.

CONCLUSION

Based on the availability of mobile technology globally, educators have had the opportunity to allow individuals from around the world to access educational resources to enable education for all. Facilitated by many initiatives, making educational resources available as open educational resources. Thus, it provides access to learning more affordable for anyone who wants to learn. The highest demand on mobile technology in the worldwide market with the support by government gives opportunities for more and more mobile learning development. Readiness of learners and educators to facilitate the transformation of education using mobile technology is aligned with the needs of learners in the 21st century through the concept of New Academia.

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ONLINE SCAFFOLDING THROUGH ASYNCHRONOUS ONLINE DISCUSSION FORUM

Noor Izzati Ariff & Zaidatun Tasir

ABSTRACT

Scaffolding has proven to be effective for supporting teaching and learning practices. In this paper, the authors intend to highlight the importance of online scaffolding in asynchronous online discussion forum (AODF) and how online scaffolding can make students' learning process more effective. We also discussed how online scaffolding is implemented in AODF. The discussion will be focusing into instructor scaffolding and peer scaffolding, including the classification of each type of scaffolding, the strengths and limitation of each scaffolding.

Keywords: online scaffolding, asynchronous online discussion forum

INTRODUCTION

Since the last decade, the rapid development of information and communication technology (ICT), brings a lot of changes to nearly every fields of life including management, entertainment, financial, and legislation (Mohd Fuad, 2014). With internet, humans have access to infinite knowledge and communication can be made to people across the globe with just a few clicks. The immense potential of internet creates interest for the educators to take advantage and implement online communication in educational

setting.

Nowadays, online learning is commonly practiced in many higher learning institutions throughout the world (Yaacov and Yaacov, 2003). Online learning not only been practised in distance education, but more campus-based higher learning institutions are starting to incorporate online learning as a major part of student learning experience. Apart from the relative cost-effective of online learning, learning has become significantly more flexible, and internet has opened the doors for the learners to reach wider sources of knowledge and worldwide expertise from their desktops.

Among other online learning activities, researchers across the globe have shown a great interest in online learning discussion because of its positive impact in students' learning and besides it has been widely used in teaching and learning process. Online learning discussion forum is a computer mediated communication that is text-based, where students are given the opportunity to share their opinion and ideas, with their instructors and their peers regardless of time and space. The importance of asynchronous online discussion forum (AODF) in online courses has been emphasized by Thomas (2002). AODF can be a medium to engage instructor and students in a way that promotes critical thinking, meaningful problem solving, and knowledge construction. Thomas (2002) also stated that AODF can lead to enhanced learning outcomes for students.

Activities involving AODF often require students to express their view, posing questions, consider other students' opinion, critically analyse every information received, and constructing comprehensive explanations. However, students may come across difficulties when they engage in a complex learning tasks. As such, students often need appropriate assistance to develop their cognitive development (Veermans and Tapola, 2004). One of the best solution is by using scaffolding. Scaffolding is an instructional support by an expert that helps student to accomplish a specific task or to fulfil a specific goal (Wood, Bruner and Ross, 1976). The expert can be a teacher, parent, or other knowledgeable peers.

Scaffolding also may enrich students' knowledge by providing them support that gradually fades. Scaffolding of learning is analogous to the scaffolding that is used in constructing a building, which is removed when the building can stand by itself. The same concept with scaffolding for learning, scaffolding is provided to help students accomplish tasks that are beyond their capabilities and it gradually reduced and eventually removed completely once the students become more competent.

SCAFFOLDING

Scaffolding was first introduced by Wood, Bruner, and Ross (1976) in their report "The Role of Tutoring in Problem Solving". According to the original definition, scaffolding refers to instructional support from more knowledgeable peers that helps student to accomplish task that cannot be done on their own. The instructional support is gradually removed or fades away as student's competence increases. Two years after that, the scaffold definition is revised and compared to Vygotsky's (1978) notion of zone of proximal development, ZPD (Sharma and Hannafin, 2007). Vygotsky's (1978) idea of ZPD concept consists of two levels of learning, which is actual developmental level, and potential developmental level. Whereas actual developmental level refers to the level where the student can accomplish task without the help of others, potential developmental level refers to the level where the student manage to accomplish task with the assistance and support by expert or more knowledgeable peers. The distance between these two levels is called the student's zone of proximal development. Figure 1 shows the illustration of ZPD concept by Vygotsky (1978).

Wu (2010) in his research about scaffolding in technology-enhanced learning environment has studied 56 research articles that focused on the implementation of scaffolding. He found out that 34 of the 56 failed to define scaffolding. The rest 22 research articles

comprised one or more of the following components: (1) receiving guidance and assistance from a more capable person (such as instructor, peer or parent) or tools, (2) constructing mutual understanding on the goals between a student and more knowledgeable peers which encourage students to engage in the task, (3) providing suitable and timely support by observing each students' learning process (4) helping students to do activities that are unable to accomplish on their own, and (5) gradually fading support as students competency increases.

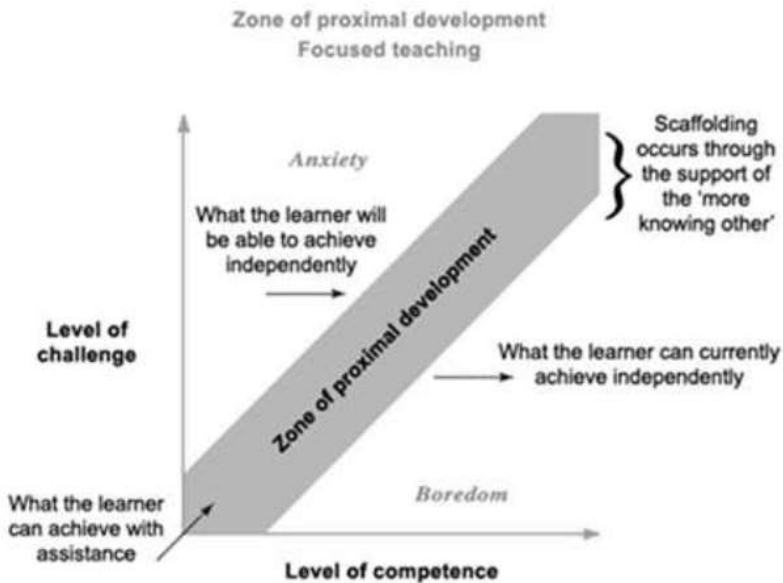


Figure 1 ZPD concept by Vygotsky (1978)

According to Saye and Brush (2002), scaffolding can be classified into two groups: hard and soft scaffolds. Hard scaffolds are fixed, non-negotiable, and primarily technology-mediated. Hard scaffolds can be in the form of computer or paper-based cognitive tools. Examples of hard scaffolds are computer simulations and animations where the scaffolds are static and support common

learning needs. On the other hands, soft scaffolds are dynamic, customized and negotiable. Soft scaffolds can be in the form of instructors' facilitation and through small group learning (Sharma and Hannafin, 2007; Choo, 2012). Example of soft scaffolding are instructor scaffolding and peer scaffolding in AODF. As this article focus on scaffolding in AODF, the author will discuss about soft scaffolds in AODF which are instructor scaffolding and peer scaffolding.

Instructor Scaffolding

Unlike peer scaffolding, instructor scaffolding is more commonly practised and past studies that utilized human-based scaffolding tended to focus on instructor scaffolding than peer scaffolding (Wu, 2010). Instructor scaffolding is important in AODF to ensure the students' discussion achieve its learning goal. Zhu (2006) also claims that cognitive engagement does not happen naturally by just making AODF available, but it needs the "intentional mediation of instructors". This is when the instructor's role is very important.

Pol, Volman and Beishuizen (2010) have highlighted the importance of scaffolding. Scaffolding not only aids students development of cognitive ability but it can increase students motivation in accomplish difficult task. Other than helping the student's learning on target and achieve learning objective, instructor scaffolding also provides explanation and justification for deeper understanding. Student's degrees of freedom can be reduced by taking over those parts that the student still not yet able to perform and thus simplify the task for the student. Scaffolding also may instil interest in a task and help students to coop with the requirement of the task. The facilitation that instructors provide may prevent or minimalize frustration by facilitating students' performance.

Rimor, Reingold and Heiman (2008) use "Tool for analysing Instructors' Online Scaffolding" (TIOS) that help them analyse

different types of instructors scaffold in online course. By using the tool, four types of online scaffolding provided by the instructor that has been identified are technical, content-centred, procedural, and metacognitive. Technical support are referring to technical assistance regarding working in online environment. Examples of technical scaffolds is “I haven’t got your paper otherwise I would have responded. Please send me your paper using another E-Mail address”. Content-centred scaffolds are support that add information, elaborate and correcting misconceptions. Examples of content support is “I recommend that you read the article by Banks, which deals with multicultural democracy, and Taylor’s book named: Politics of Recognition”. Procedural scaffolds assist students in managing data process such as searching information, organizing information and representing the data. Examples of procedural scaffolds is “Finally a comment based on assigned articles. Your previous postings were interesting and scholarly, but this is the first one which is related to the theoretical framework of the course”. Finally, metacognitive scaffolding refers to instructors support that present rational for task and activities, present the relationship between reading items, course objectives and tasks, support reflective writing, supervising text comprehension, and encourage relationship among participants. Examples of metacognitive scaffolding is “You are right, there are several democratic models, and this is the topic of this course. Which model do you prefer? ”.

Even though instructor scaffolding benefits student learning, instructor should know when and how to scaffold students’ learning. As ‘fading’ is an important concept in scaffolding, instructor should know when is the right time to minimise and eventually remove the scaffolding. Another point to consider, Stone (1998) point out that instructor scaffolding is not effective to be applied for a large number of people in a group. It is because every students have different levels of ZPD, thus in this situation peer scaffolding might be a better option.

Peer Scaffolding

Peer scaffolding benefits both parties involved; students who provide scaffolding, and students who receive scaffolding. Oliver and Naidu (1996) stated that when students engage in a discussion, explaining, elaborating, and defending one's position to others, as well as to oneself, students are integrating and elaborating their knowledge in ways that facilitate higher-order learning. Findings from Vonderwell, Liang, and Alderman (2007) study also found that when students are questioned or given further information on a topic, they expand their knowledge base because they are forced to dig deeper into a topic than they have done otherwise on their own.

Moreover, interactions between peers provide them with the opportunity to identify their relative strengths and weaknesses. Students who are knowledgeable in the topic discussed can provide scaffolding by sharing the knowledge with their peers. If there are disagreement or discrepancies at this stage, students can raise these issues for discussion. In addition, peer scaffolding may motivate other students to learn (Forman, 1989). Also, students may be more willing to express their opinions and engage in discussions when interacting with peers than with teachers (Tudge & Rogoff, 1989).

Kim and Hannafin (2010) comes up with four patterns of peer scaffolds which are; demonstration, procedural assistance, validation, and exchange of multiple perspectives. Demonstration typically involved asking/showing technical problems. This pattern of peer scaffold are obvious when the discussion is about activities that require the students to acquire computer skills. Procedural assistance usually occur when students helped each other to master certain procedure. Validation pattern occur when students confirming their answer with their peers. Last but not least, exchanging perspectives usually happen when students discussing about a project. The students exchange ideas on structure, content and design.

Despite its advantages, peer scaffolding also has some drawbacks. The most dominant limitation for peer scaffolding is

students will never provide the same quality of scaffolding as instructors. Plus, the more knowledgeable peers may not know how to provide support that adapts to the changing needs of their fellow students (Wu, 2010). Other than that, without the supervision of the instructor, it is possible if the more knowledgeable peer are actually having misconception. Thus, it is unavioded if the student provides wrong information to other peers. Nevertheless, peer scaffolding is more helpful for completing tasks than developing higher level thinking skills. Thus, it will be more appropriate for the students to collaborate with each other than relying on a more knowledgeable peer (Wu, 2010).

CONCLUSION

When designing and implementing AODF, it is important for the instructor to consider how students discussion in AODF might assists students to achieve learning goals. Both peer scaffolding and instructor scaffolding have their strengths and weaknesses. It is up to the instructors to choose the right scaffold that suits their students' background and learning objectives.

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AUGMENTED REALITY AND ITS APPLICATION TO LEARNING

Somaiyeh Vedadi, Baharuddin Aris & Zaleha Abdullah

ABSTRACT

Technology has affected everything including education in today's world. The present-day schools feel the responsibility to educate and prepare learners for a society that does not yet exist. This feat requires a different tool from those employed in the old non-technological classrooms of the past and is making the 21st-century world become more and more complex. One of the key developments in technology is Augmented Reality (AR), which has proven to be a veritable tool for communicating information in ways that are otherwise impossible. Similar, yet different from its predecessor, Virtual Reality (VR) in that in VR people are expected to experience a computer-generated virtual environment whereas in AR, the environment is real, but extended with computer-generated information and imagery, AR properly employed can actually deliver many advantages as a tool for technology-enhanced learning. It effectively bridges the gap between the real and the virtual in a seamless way. It has great advantages for the learner and has potential as a practical and valuable classroom tool, however, little investigation has focused on actual human performance gains associated with the use of the AR medium. This paper examines the existing literature on practical classroom implementation of AR and its gains. Furthermore, the current problems are identified and suggestions are made. This will help in raising and maintaining learners' attention in a class to facilitate and improve teaching and learning experiences in a digital classroom.

Keywords: augmented reality, educational technology, education, and media

1. INTRODUCTION

Personal computers have contributed significantly to the growth of technology in the last century. Information Technology has become a major factor that determines the pace that how everything is done. However, the technological bloom has also placed new demands on institutions of learning at all levels not only to keep abreast of information but to produce technologically sound and digitally compliant individuals who can function in today's world as well as in the 'one to come' In an effort to keep education up to date the last one decade has witnessed the introduction of new Informational and Communication Technologies. Research has confirmed the efficacy of ICTs as learning tools. One of the key developments in technology is Augmented Reality (AR). AR supports the understanding of complex phenomena by providing unique visual and interactive experiences that combine real and virtual information and help communicate abstract problems to learners. Finally, AR can enable new forms of face-to-face and remote collaboration and shared learning experiences (Dünser, 2012).

1.2 AR VERSUS VR

AR or Augmented Reality is a system whereby a real environment is extended with digitally-generated information. It is thus a mixture of real and virtual. It is different from Virtual Reality (VR), a previous and similar technology in that in VR the environment is completely virtual; it is wholly computer-generated. According to Chang, Morreale, & Medicherla (2010), AR constitutes a seamless bridge between the real and the virtual world. The advantages of

AR however have not been fully explored. Assessing the effectiveness of AR as a learning tool deserves in-depth review of the fields of cognitive psychology in conjunction with computer-based virtual reality (Majoros & Neumann, 2001) It is a blended experience, a digital overlay onto the real world involving the synthesis of digital information and reality (Zachary, Ryder, Hicinbotham, and Bracken, 1997).

1.3 HOW AR WORKS

Graphical information appears in a person's field of view; audio then coincides with what is seen. This information gets updated continually to reflect head movements. Augmented Reality adds 'reality' to the natural world through graphics, sounds, blurring the line between what's real and what's computer-generated by enhancing what is seen, heard or touched.

1.3.1 AR As A Learning Tool

Johnson, et al. (2010) argues that AR can provide opportunity for very strong, context-based learning in the real world. The use of AR in both school and non-school settings needs to be explored. However, a major previous challenge with AR is the cumbersomeness and non-portability of the equipment or units; but with increasing technological development, AR is becoming more and more compact and AR experiences are becoming quite easy to deliver in not only corporate but also academic settings. PCs as well as other modern electronics such as smart phones, tablets have opened up many opportunities especially in education and training.

1.4 AR IN EDUCATION

Informational and Communication Technologies have consistently been found to offer improvement to the capabilities of a standard curriculum. With the advent of AR, text and multimedia can be added to student's real time environment. Traditional educational reading material can contain embedded links that can generate digital, multimedia information in the user's field of view when scanned by AR equipment. For example, an AR device can help to access digital media objects related to a place, space, thing or event; learners can interact with virtual simulations of historical events, exploring and learning details of each location. In science education, AR can assist students in their understandings by allowing them to visualize the spatial structure of a molecule and interact with a virtual model of it. AR-based technology is also helpful for distance learning by promoting a means for student-student and instructors-students collaboration in a common virtual learning environment.

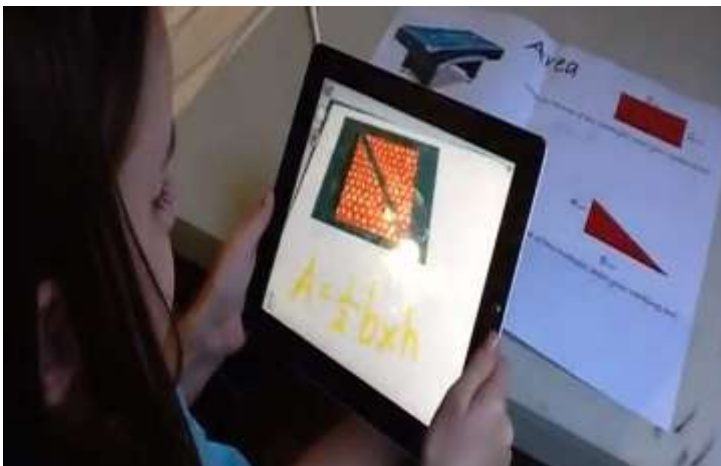


Figure 1. Image guided Augmented Reality in Mathematic Education

1.4.1 AR In The Classroom

Research provides evidences about the application of AR in the science classroom. The adoption of augmented books and student guides have also been explored. However, Shelton (2002) found that the advantages of AR have not been fully explored due to the twin reasons of the financial implications as well as a low level of awareness of its many advantages in an academic setting.

1.4.2 AR In Higher Education

AR can be a veritable and efficient tool in higher education. It can be applied to the resolution of complex theories, equipment operations, and other complicated systems. Liarokapis, et al. (2004) shows that AR can assist university students to understand complicated mechanisms and difficult theories through enriched interaction using AR technology. They showed an AR view of a student by examining an augmented 3D model of a camshaft arrangement in conjunction with a set of real engine components.

1.4.3 AR Reading Materials

An Augmented Reality product of the United State Institute for the Promotion of Teaching Science and Technology is an AR-based 3D Book that teaches children about the earth and its layers, their functions, siesmic waves. The AR material has the potential to appeal strongly to the interests of children because of its unique 3D interaction and presentation.

1.5 THE TRANSFORMATION CAPABILITIES OF AR IN EDUCATION

1.5.1 User-Content Interaction

A single picture is worth a thousand words' is a common saying that lends credence to the importance of graphics in combination with ordinary text in enhancing learning. AR can be a suitable way to enhance a story. Though reading through a text creates a visual picture in the mind, the impact can be multiplied through the addition of AR graphics. The future holds the potential for more advanced storytelling through AR-enabled books and mediums. Students will not only be able to read, and see the characters come alive but will also be able to interact with the characters.

1.5.2 Engagement Of The Senses

There is a famous Chinese saying "What I hear I forget, what I see I remember, what I do, I understand." could not have been more appropriate. Seeing is undoubtedly a great way to learn, but being able to touch or interact with what is being learnt is a great way to improve learning. AR allows for user-content interaction, thereby improving learning experiences.

1.5.3 Bringing The Past To The Present

Imagine the possibility of learning about persons that lived centuries ago through a digital interactive view of them in their lifetime; or being able to watch and 'participate' in an event that happened in the past; that is what history education is simply about. Rather than an abstract picture of the details, AR can create a situation where the learner becomes a part of the event. This will create such a learning experience that otherwise is impossible.

1.5.4 Learning: Anytime, Anywhere

It is quite clear to see about current technologies is the fact that learning environments are changing. The traditional four-walled classroom is fast becoming outdated as the world moves into wall-less classroom with the removal of geographical and time restrictions. With AR technology, a learner can multi-task; learning can take place anywhere and anytime. Children, as well as adults can learn while playing. With new mobile applications, including smartphones and tablets, learning can be extended to any environment the learner finds him/herself.

1.5.5 Collaborative & Social Learning

Social Learning or learning from others as well as Problem Based Learning are both learning modes that are important for today's learner. Learners can work together on projects, share with one another, collaborate to solve problems and even share the results of problems solved to improve learning. AR is one means by which this is made possible. Through mobile applications, groups of learners can interact in real-time, exchange opinions, offer suggestions and draw conclusions together.

1.6 CONCLUSIONS

This paper reviewed the place of Augmented Reality in education. The paper concludes that AR is a suitable way to bring about 'learning through doing' which has been found to be critical to the learning process. It provides learners with the opportunity to be involved in their own learning, to experience the virtual world in a real way and interact with what was previously abstract and unreachable. As low-cost infrastructure continued to become more available, Augmented Reality as an educational technology deserves

more attention. The paper suggests that teachers not only need to become positioned to make use of these technologies but application development should also focus on classroom-adapted applications for various learner groups including students, adults and even special learner groups like the physically and mentally challenged. The paper further suggests that the invaluable improvement to teaching and learning can be made with AR cannot be over-emphasized. The paper concludes that Augmented Reality is still in its developmental stages and the advantages that have been seen are pointers to what lies in the future of the digital classroom. But is essential that both teachers and students should avail themselves of the currently available opportunities to be able to follow future progress.

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QUALITY OF REFLECTION IN LEARNING THROUGH BLOGGING: A THEORETICAL FRAMEWORK

Siti Khadijah Mohamad, Zaidatun Tasir

ABSTRACT

Developing students' capability to reflect at meaningful standard serves as a way to assess their learning process. Even though numbers of literature which support this goal seem to be growing, to systematically apply reflection strategies in learning has yet to be scrutinized. Thus, a proper theoretical framework is needed and it is common in educational research where, for every learning process created, it must in line and backed with specific educational theories as those theories should be able to describe how the learning process takes place. We will first look into how blogging is supported by the social constructivism theory and followed by the grounding theory of reflective thinking, case-based learning, and feedback, respectively as to achieve the target of this research study that is quality of reflection in learning through blogging.

Keywords: Blogging; Reflection

INTRODUCTION

Developing students' capability to reflect at meaningful standard serves as a way to assess their learning process. Even though numbers of literatures which support this goal seem to be growing,

to systematically apply reflection strategies in learning has yet to be scrutinized. Thus, a proper theoretical framework is needed and it is common in educational research where, for every learning process created, it must in line and backed with specific educational theories as those theories should be able to describe how the learning process takes place. We will first look into how blogging is supported by the social constructivism theory and followed by the grounding theory of reflective thinking, case-based learning, and feedback, respectively as to achieve the target of this research study that is quality of reflection in learning through blogging.

BLOGGING AND SOCIAL CONSTRUCTIVISM THEORY

Blogs have been used for variety purposes - ranging from individual interests, businesses, educational purposes, and etc. In educational aspect, blogging has garnered wider interest in higher education as reported by several researchers (Churchill, 2009; Deng & Yuen, 2011; Dippold, 2009; Downes, 2004), all thanks to its learning environment that is capable in sustaining good pedagogical strategies. In the context of this research, blogging serves as the main activity to foster reflection in learning as it shared the affordance of reflective thinking and tool for reflection (electronic journal) and collaborative learning (Deng & Yuen, 2009). Based on that statement, in general, social constructivism perspectives seem to address the practicalities of reflection through blogging in certain ways (Sharma & Monteiro, 2012).

Social constructivism theory emphasizes on learners which are able to build new comprehension and knowledge during the social interaction with peers (Wink & Putney, 2002). Vygotsky (1978) stated that a person can develop deep understanding through collaboration and from more knowledgeable peers rather than from his/her own ability. Learners are invited to activate their prior knowledge and construct new information based on what they already know (Driver & Easley, 1978). They are given

opportunities to test new knowledge claims with peers and link these new ideas with personal experience and existing knowledge (McRobbie & Tobin, 1997) and finally construct shared meanings (Prawat, 1993).

Blog, meanwhile acts as an ideal interactive knowledge-exchange platform (Herring, 2004) –“interactive in a sense that learner can respond with comments which will be beneficial in promoting a collaborative learning environment” (Ahmad & Lutters, 2011) and further support the social constructivism underlying perspectives. Responding and interacting through blogs may stimulate reading, motivate learning and build the community space. Blogging may grant these positive attitudes and conditions when essential features like comment box, Really Simple Syndication (RSS) feed, follow button, tag function, to name a few, are used in order to initiate and engage in social interaction. Even interacting through written form may provide positive impact on learning since it allows learner to have quality time to reflect and articulate on the ideas in regard to certain issues (Meyer, 2003; Yang, 2009). Blogs enable learner to archive article and categorize content easily via its tag function. New articles or blog contents can be subscribed and delivered in instant through the RSS news feeder (West et al., 2006). A good learner will see this as a way for he/she to take ownership of his/her own learning. Since articles and information can be easily gathered, all that left to do is to share the knowledge to the rest member of community, get together online and critically negotiate shared meaning on that knowledge, by posting ideas regarding their prior knowledge and past experience on that matter, thus new understanding can be constructed rather than communicating already formed answer (Boyd, 2013). This is how blogging is actually operationalized in action as to fit with the fundamental perspectives of the theory concerned.

REFLECTIVE THINKING AND CONSTRUCTIVISM THEORY

Reflective thinking is rooted from John Dewey's (1933) seminal work on reflection concept. Reflection activity is said to benefit the learning process since it has proven connection with deep learning which in turn leads to personal growth and meaningful change, though students sometimes get tired with the process. If reflection is missing in teaching and learning process, only shallow learning can result (Biggs, 1999). Reflective thinking as suggested by Dewey (1933) is an "active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends". It means that one is supposed to be conscious of his/her own thinking by continuously evaluating what they know (which is based on prior experience and belief) and what they need to know and how they go with the understanding he/she gained in order to be applied in making judgment in certain situation.

As we all know, thinking happens so fast in one's mind and often we found ourselves come out with the idea or suggestion without even notice how we actually arrived to that point. Reflective thinking therefore gives us an opportunity to track and gain access to our thinking process by documenting the mental process, that is through series of questioning oneself on related aspects of experiences which aims to create confusion and conflict. By doing so, we will then have clear understanding on how one can reaches to a conclusion and able to gain some rationale justification along with it, thus the same strategy is applicable to be used in the future encounter of related problem. If educators are planning to implement reflective thinking in learning, they must impede the rote memorization act and focus on encouraging individuals to step back, rethink, relate and adapt to their prior experience and knowledge as this will help them to develop different perspectives and strategies to be applied to complex situations and problems.

Besides being the famous scholar for reflection concept,

Dewey is also known as the philosophical founder of constructivism theory. This theory emphasized for learning to be based in real experience. Dewey against the idea that focus on rote memorization way of learning. Students, in fact, are supposed to engage in real-world thus they are more able to think and articulate their thoughts and presenting their knowledge creatively (Mapes, 2009). This perspective is closely align with the reflective thinking concept where students are warrant to engage in reflective thinking process by using the prior knowledge and experience in order to weave new generated knowledge and understanding. Besides, Noddings (1990) in his view of constructivism also convinced that certain part of knowledge is actually constructed via reflection process.

Now, in this research study, students' reflective thinking process is captured through blogging activities. In order to assess their reflective thinking process, a model is needed. There are numerous models have been developed by the researchers (Hatton & Smith, 1995; Lamy & Goodfellow, 1999; Jay & Johnson, 2002; Thorpe, 2004; Ward & McCotter, 2004; Lee, 2005; Oner & Adadan, 2011; Etscheidt, Curran & Sawyer, 2012 and etc). Despite the existing models that available, this study will use the one that originally created by Hatton and Smith (1995). The model consists of four levels which are descriptive writing, descriptive reflection, dialogic reflection and critical reflection.

To think reflectively demands the use of appropriate strategies like effective instructional learning activity and provision of guidance. This is to ensure that when students are engage with the reflection activity, they are able to learn and construct meaningful information on the subject matter areas and retain knowledge. Further elaboration on these matters can be found on the following sections.

CASE-BASED LEARNING AND SOCIAL CONSTRUCTIVISM THEORY

There are many terms used to describe case-based learning, for instance, enquiry based learning, problem based learning, scenario based learning, and etc. Despite the differences in the terms used, the researchers however, have agreed upon the case-based learning concept as an innovative teaching and learning method whereby it offers students and teachers to embrace active role in an authentic learning, and facilitate the development in critical thinking and vital employability skills (Hale, 2005). Case-based learning is said to align with the central perspectives of social constructivism theory where this learning strategy has stressed on the importance of cultural, social context, real-life experience and collaborative in building knowledge and understanding. It becomes operational in two ways (Koc, 2011):

1. Case-based learning calls for students to collaborate on the given cases/situations. Students should get into collaborative learning setting (to express thoughts, emotions, practice negotiation, communication skills, and articulate different perspective) as to weave knowledge and understanding. By nature, this spots the importance of social interaction in forcing learning among students as penned by Vygotsky (1978).
2. Students are not spoon-fed with knowledge as done in traditional way of teaching. In case-based learning, students are given with adequate knowledge just to initiate the discussion on the cases and from there they need to solve the problem themselves and construct shared meaning. This requires students to embrace active role and critical thinking and eventually fill in the hole in one's knowledge regarding the problem/situation. Again, this is consonant with the social constructivism theory where each student needs to construct collaboratively on knowledge based on past experience, cultural factors and repetitive testing with assumptions (no

single right answer) that are relevant to real life practices (Vygotsky, 1978).

The main component in case-based learning is problem solving. Students are said to be more motivated in learning by solving real world problems (Lombardi, 2007). In computer-based subject (like Authoring System), the cases are designed based on the problems often faced by students during the development of multimedia application.

There is a challenge to come out with cases that deal with computer-based matter in regard to real setting since students do not have access to real environment as compared to those in law, medicine or business discipline. The least that could be done is that, the cases should be able to make students to feel, think and engage like they are in the real situation, and making connection of what they learnt today with future job task. For this to happen, an effective case should be designed and include the following characteristics, as suggested by Herried (1997):

1. The case should resembles the subject matter objectives
2. The case should provide an authentic situations
3. The case should tell a story, relevant and focus on an issue that stirs interest, states the dilemma without resolving it
4. The case should promote decision making and there is no single right answer

When students are given the case, they need to read through the scenario and embrace the role of decision maker. They are then required to perform certain analysis by constructing relevant assumptions on what might cause the problems and the possible solutions/recommendations. Prior knowledge that they received during lecture will support them in making those analyses. The knowledge is delivered through the form of apps, where the apps consist of interactive information on learning the subject matter. To get the most out of the cases, they need to do some hands-on work to prove that the solutions they proposed earlier are working or not – it is more to see the ability to apply the skills taught practically

rather than theoretically.

FEEDBACK AND SOCIAL CONSTRUCTIVISM THEORY

The central focus of this research study is on the quality of students' reflection in learning Authoring System subject. As pointed out by some researchers, quality of reflection does not occur in a void without some influence from external factor like feedback (Chen et al., 2009; Dippold, 2009; Dymont & O'Connell, 2011; Ertmer et al, 2007; Xie et al., 2008). This is parallel with Dewey's view where he underlined the importance of interaction between learners towards effective reflection since this process involves meticulous thinking which takes time to develop (Mapes, 2009; Rodgers, 2002). In accordance to a study conducted by Chen et al. (2009), they claimed that by leveraging the power of feedback, the quality of reflection will be positively affected.

In order to understand how the behavior of provision and utility of feedback can affect the quality of reflection done, we must first aware about what feedback is all about. Feedback, according to Liu and Carless (2006) is "a communication process through which learners enter into dialogues related to performance and standards". In other word, it is kind of feedback that rich with detailed comments without involving the formal grades (Liu & Carless, 2006). Good feedback and clear guidance is said could assists students to gain understanding and improve learning on subject matter (Orsmond et al., 2013).

Numbers of studies on feedback are supported by the social constructivism theory that is popularized by Vygotsky (1978). This is due to the shared perspectives between these two. Social constructivism states that knowledge is developed and progress through social interaction among learners and it requires consistent and active engagement with others (Vygotsky, 1978). Vygotsky further claims that an individual supposed to exchange and negotiate understanding as well as drawing from more

knowledgeable person in order to be able to learn a concept and construct knowledge.

Building from this perspective, feedback is seen as bidirectional transmission of knowledge between instructor-student, student-student and feedback environment (Higgins et al., 2002; Price et al., 2011). This highlights the requirement for feedback to be part of a dialogic process (Orsmond et al., 2013). Feedback also plays a role in determining the engagement since “it not only carries content, but also relational information about the person giving it and the context in which the giver and receiver is situated (Orsmond et al., 2013)”. This somehow reflects the aspect of community of practice as suggested by Lave and Wenger (1991) where, the notion of community of practice implies that when students join the academic community – by sharing and discussing ideas will help them to slowly start to assimilate and think like the rest member of academic community and eventually led to the empowerment of students, therefore meeting the expectations of the community. This actually supports the idea that knowledge is not only located in the real world, however in specific practice and social relations (Carlile & Jordan, 2005) and can only be realized through feedback process provided that dialogue interaction between members of communities takes place (Blair & McGinty, 2010).

Despite the fact that the social constructivism theory has promising perspectives to lift up the feedback process in learning, much of the research on feedback still face some criticism and misunderstanding every time the theory is translated into practice. It is cited that less structured strategy used to enforce feedback and students’ engagement with the process is to blame for the failure in carrying out the process effectively (Orrell, 2006). This certainly calls for serious adjustment to the nature of the research conducted by looking into the aspect of feedback delivery, as suggested by some researchers (Blair & McGinty, 2010; Wang, 2008). Considering the fact that this research study will be carried out through online mediated environment, thus it is important to

evaluate prudently the processes of provision and responding to feedback towards deeper understanding on the quality of reflection done (Cho et al., 2011).

Although learning via online environment can help students easily in gathering feedback (Tseng & Tsai, 2007), provision of effective learner support would still needed which include the assistance for reflective thinking, social dialogue and extension of ideas with feedback on the issues concerned (McLoughlin, 2002). Research does claim that the use of guided-question has been effectively increase quality of discourse and deeper engagement (Zingaro, 2012). Nevertheless, designing guided-question for learning has becomes an issue in an effort to increase the quality discussion because types of questions given to the students will affect the way they might respond to it - surface level of questions will reflect the surface level of thinking and vice versa (Bradley et al., 2008; Ertmer et al., 2011; Ge & Land, 2004). Thus, in creating appropriate guided-question to facilitate the feedback process, we must first associate it with the need of the study and the nature of the task. This is to ensure that it is able to influence students thinking and understanding of the course content. Since this study will incorporate the use of case-based learning instructional strategy in its learning activity, thus guided-question type which developed by Bradley et al. (2008) will be used in order to facilitate students' reflective thinking in learning.

For this strategy to benefit learning the most, especially in leveraging the quality reflection, the whole process should be done transparently. For example, when students are expected to discuss and interact in online discussion, they should be given training and whatever guideline and support that might be needed by them, thus they will have the confidence in participating and also the sense of connection with the whole process. This is not going to be easy anyway, since it demands enormous amount of energy, time and patience, however, if every parties, including the teachers and students are aware from the very beginning on the pedagogical benefits of this strategy might bring, then the chances of having it to

be implemented successfully is high.

The following figure represents the theoretical framework as suggested by this research study.

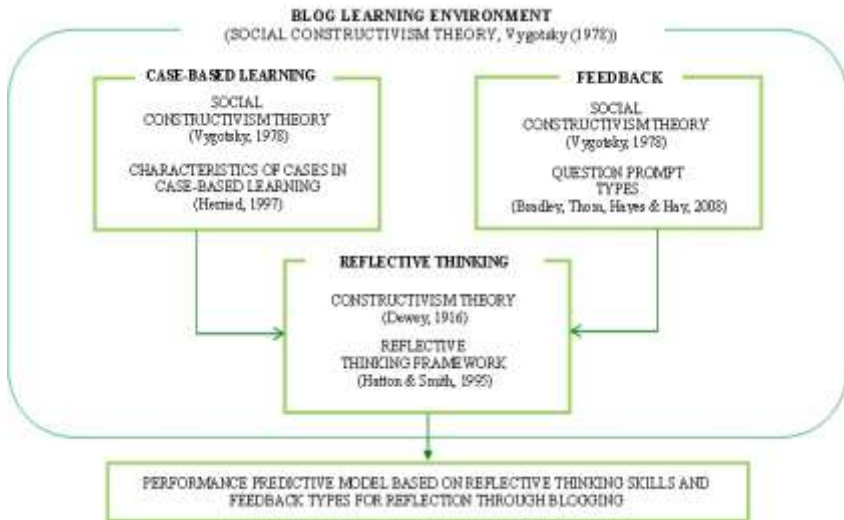


Figure 1 The proposed theoretical framework

CONCLUSION

In summary, this article has described in detail regarding the theoretical underpinning of the selected pedagogical strategies and how they are blended together as a basis to carry out the research study. It is cited that “theory matters because without it education is just hit and miss...we risk misunderstanding not only the nature of our pedagogy but the epistemic foundations of our discipline” (Webb, 1996). In relation to this, it is hoped that if the proposed theories blended well on a paper, it will also work effectively in practice, where the quality of reflection in learning through blogging is expected to be achieved.

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KERANGKA KONSEP PEMBENTUKAN KEMAHIRAN REKA BENTUK PELAJAR BERMASALAH PEMBELAJARAN SPESIFIK MENERUSI PEMBELAJARAN AKTIF DALAM PERSEKITARAN AUTENTIK

Nurul Athirah Mohd Zahirruddin & Noor Azean Atan

ABSTRAK

Setiap individu mempunyai kemampuan dan keupayaan menerima sesebuah pembelajaran yang berbeza terutamanya gaya pembelajaran mereka untuk mencapai ketahap pemikiran aras tinggi. Namun begitu, segelintir pelajar masih berada dalam golongan pelajar bermasalah pembelajaran dimana ketidakupayaan sesetengah pelajar ini untuk senantiasa seiring dalam pembelajaran dengan rakan-rakan lain telah menimbulkan perasaan rendah diri, penurunan tahap motivasi serta mengalami gangguan emosi dan tingkah laku EBD (Emotional or Behavioral Disorders) dalam menyesuaikan diri mereka dengan persekitaran pembelajaran sekeliling. Pelajar ini juga sering menghadapi masalah dalam mengikut arahan, mengalami kesukaran dalam menerima maklumat visual atau auditorit, kurang kemahiran serta tidak dapat melaksanakan tugas dengan baik. Golongan pelajar ini dikenali sebagai Pelajar Bermasalah Pembelajaran Spesifik atau pelajar lembam (slow learners). Justeru, dalam usaha membantu pelajar bermasalah ini, suatu strategi pembelajaran yang efektif perlu dirangka dan dilaksanakan bagi memberi peluang kepada mereka

mengikuti pembelajaran dengan baik. Oleh demikian, sebuah pembelajaran aktif serta bermakna dan menyokong kepada peningkatan fahaman dan ingatan dalam persekitaran autentik iaitu realistik diintegrasikan bersama supaya dapat merangsang motivasi serta minda mereka agar terus memberi fokus dalam pembelajaran, berpeluang menimba pengalaman melalui aktiviti pembelajaran yang autentik dalam menyokong kepada pengekalan maklumat ingatan, dan seterusnya pembentukan kemahiran reka bentuk mereka. Maka, ruang bagi membina pengalaman autentik dan penyediaan ruang refleksi sendiri terhadap aktiviti pembelajaran pelajar direka bentuk bagi membantu pelajar bermasalah pembelajaran spesifik belajar lebih berfokus melalui penambahan elemen teknologi bervisual menerusi kemudahan teknologi web masa kini dalam menyokong kepada pembentukan kemahiran reka bentuk mereka.

Kata Kunci: Pembelajaran Aktif; Pelajar Bermasalah Pembelajaran Spesifik; Persekitaran Autentik

PENGENALAN

Pada zaman teknologi yang serba canggih ini, pelbagai usaha diambil bagi menggalakkan dan melaksanakan unsur-unsur teknologi dalam apa jua bidang yang diceburi iaitu melalui aktiviti-aktiviti pembelajaran yang melibatkan penggunaan teknologi seperti ICT. Persekitaran pembelajaran yang lebih dinamik perlu diterapkan sekiranya penggunaan ICT ingin dilaksanakan dalam menarik perhatian pelajar. Namun begitu, dalam kerangka menyetengahkan teknologi dalam pendidikan kita, terdapat pula pelajar yang agak ketinggalan dalam banyak perkara yang menyebabkan mereka hilang motivasi diri untuk meneruskan proses pembelajaran (Al-hashmi, 2008; Malik *et al.*, 2012). Hal ini sering berlaku dalam kalangan pelajar-pelajar yang mempunyai masalah pembelajaran spesifik (*specific learning disability*). Hopkins (2007) menyatakan, antara strategi pembelajaran yang membantu

pelajar bermasalah pembelajaran spesifik belajar haruslah mampu menggerakkan mereka melakukan suatu aktiviti pembelajaran yang aktif agar mereka dapat berinteraksi bersama dalam proses pembelajaran mereka.

Oleh yang demikian, kaedah pembelajaran tertentu beserta penggunaan teknologi harus dilaksanakan bersama agar kemudahan media ini dapat menarik minat pelajar, membantu pelajar yang mempunyai masalah pembelajaran spesifik belajar dengan lebih baik dan bermotivasi.

LATAR BELAKANG

Sebagaimana yang dinyatakan oleh (Malik *et al.*, 2012; Shaw, 2010), bagi guru-guru dan pentadbir, salah satu cabaran terbesar dalam populasi pelajar adalah pelajar bermasalah pembelajaran spesifik yang dikenali sebagai pelajar lembam (*slow learners*). Seorang pelajar yang lembam adalah kerana pelbagai sebab, antaranya ialah motivasi diri yang rendah, masalah perilaku, masalah menumpukan perhatian dan latar belakang keluarga (Hopkins, 2007). Manakala, Kavale *et al.*, (2009) menjelaskan, definisi atau terma kepada “masalah pembelajaran spesifik” adalah kelewatan perkembangan melebihi satu daripada proses pertuturan, pembacaan, pengiraan, penulisan atau lain-lain mata pelajaran yang diajar di sekolah.

Jika diteliti dengan lebih mendalam, pelajar-pelajar yang mempunyai masalah pembelajaran ini menghadapi pelbagai masalah dan memerlukan perhatian yang secukupnya untuk membimbing mereka. Hal ini disokong oleh kenyataan beberapa penyelidik ‘masalah pembelajaran’ terdahulu seperti (Levine *et al.*, 2008; Shaw, 2010; Malik *et al.*, 2012) iaitu aras pemikiran pelajar-pelajar ini berada di sempadan intelektual oleh kerana mereka biasanya belajar atau melaksanakan sesuatu tugas dengan perlahan dan kurang memberikan tumpuan terhadap perkara yang sedang dilakukan. Dengan kata lain, ketidakupayaan pelajar untuk seiring

dengan pembelajaran kelas boleh menghasilkan perasaan kekurangan, tiada motivasi diri, kebimbangan prestasi dan juga ketidakupayaan tingkah laku dalam menyesuaikan diri terhadap persekitaran (Levine & Barringer, 2008). Ekoran daripada masalah dan cabaran yang dihadapi oleh pelajar bermasalah pembelajaran dan guru yang mengajar, pelbagai kaedah atau strategi telah dicadangkan oleh penyelidik terdahulu dalam membantu pelajar-pelajar ini dan antaranya adalah pembelajaran yang berasaskan aktiviti dengan melakukan kerja yang melibatkan banyak pergerakan tubuh (Brunswick, 1999). Hal ini disokong oleh Richards (2008) bahawa aktiviti yang banyak melibatkan pergerakan atau pembelajaran berasaskan aktiviti adalah bersesuaian dan berfaedah bagi pelajar bermasalah pembelajaran. Darling-hammond *et al.*, (2010), menyarankan elemen dalam pembelajaran aktif yang bukan sahaja untuk melibatkan diri dalam pembelajaran, malah prestasi kemahiran juga adalah lebih penting dan kebanyakannya dapat dikenal pasti ketika melakukan aktiviti yang melibatkan pergerakan atau dikenali sebagai '*hand's on*'. Tambahan pula, pelajar yang mempunyai masalah pembelajaran ini akan mendapat kebaikan yang pelbagai melalui aktiviti yang melibatkan mereka secara aktif contohnya menerusi pembelajaran aktif (Richards, 2008).

Sebagai salah satu cara membantu mengatasi cabaran ini adalah dengan mewujudkan suatu persekitaran pembelajaran yang menarik dan kondusif. Dengan ini, persekitaran pembelajaran aktif perlu diwujudkan untuk menarik pelajar-pelajar bagi membolehkan mereka melibatkan diri dalam aktiviti kelas. Melalui definisi pembelajaran aktif yang dinyatakan oleh Silva (2010), pembelajaran aktif adalah melibatkan pelajar melakukan sesuatu dan berfikir tentang apa yang mereka lakukan secara aktif di dalam kelas atau semasa aktiviti pembelajaran. Manakala, (Auster, 2006; Beer *et al.*, 2010), pula menyatakan bahawa pembelajaran aktif melibatkan pelajar dalam pembelajaran melalui aplikasi teori dan konsep iaitu proses pembelajaran menyelesaikan masalah latihan, simulasi, kumpulan kecil tidak rasmi, peranan bermain dan aktiviti-aktiviti

lain.

Dalam menyokong pembelajaran aktif, aktiviti yang dilaksanakan adalah berasaskan situasi sebenar iaitu bersifat realistik dan autentik (Herrington *et al.*, 2014). Herrington (2006) pula berpendapat bahawa, pelajar sebenarnya secara tidak langsung terlibat dengan masalah realiti apabila pembelajaran itu adalah bersifat autentik. Sehubungan dengan itu, Herrington (2006) telah menggariskan sembilan ciri-ciri persekitaran pembelajaran autentik menerusi situasi ini yang akan diguna pakai bagi menyokong pembelajaran aktif. Ciri-ciri bagi persekitaran pembelajaran autentik menerusi situasi adalah menghasilkan konteks autentik di mana menunjukkan cara ilmu pengetahuan akan digunakan dalam kehidupan sebenar, menghasilkan aktiviti-aktiviti autentik, kemudian menghasilkan akses untuk pelaksanaan yang baik dan proses memodelkan atau peniruan kepada konsep sebenar, seterusnya, menghasilkan pelbagai peranan dan perspektif, menyokong pengetahuan dalam membentuk kolaboratif, menggalakkan refleksi, menggalakkan artikulasi dan akhirnya menyediakan *coaching* dan *scaffolding* serta menghasilkan penilaian pembelajaran autentik termasuklah tugasan (Herrington & Kervin 2007).

Walaupun begitu, dengan kecanggihan yang ada pada zaman serba moden kini, pembelajaran yang dilaksanakan tanpa melibatkan elemen teknologi menjadikan pembelajaran kurang bermakna dan hambar lebih-lebih lagi pembelajaran yang memerlukan pelajar untuk menjalankan aktiviti di dalam kelas.

Hung & Khine (2006) menyatakan bahawa belajar dengan menggunakan komputer atau komputer dalam pembelajaran adalah salah satu penggunaan teknologi yang mampu membina persekitaran pembelajaran yang berkesan, dimana teknologi merupakan alat atau media visual yang digunakan untuk membantu pembelajaran. Tambahan pula, teknologi seperti pembelajaran berasaskan web yang digunakan secara meluas dalam pendidikan juga boleh menarik minat pelajar-pelajar untuk kekal bermotivasi untuk belajar. Manakala, Beer *et al.*, (2010) dan Huang *et al.*,

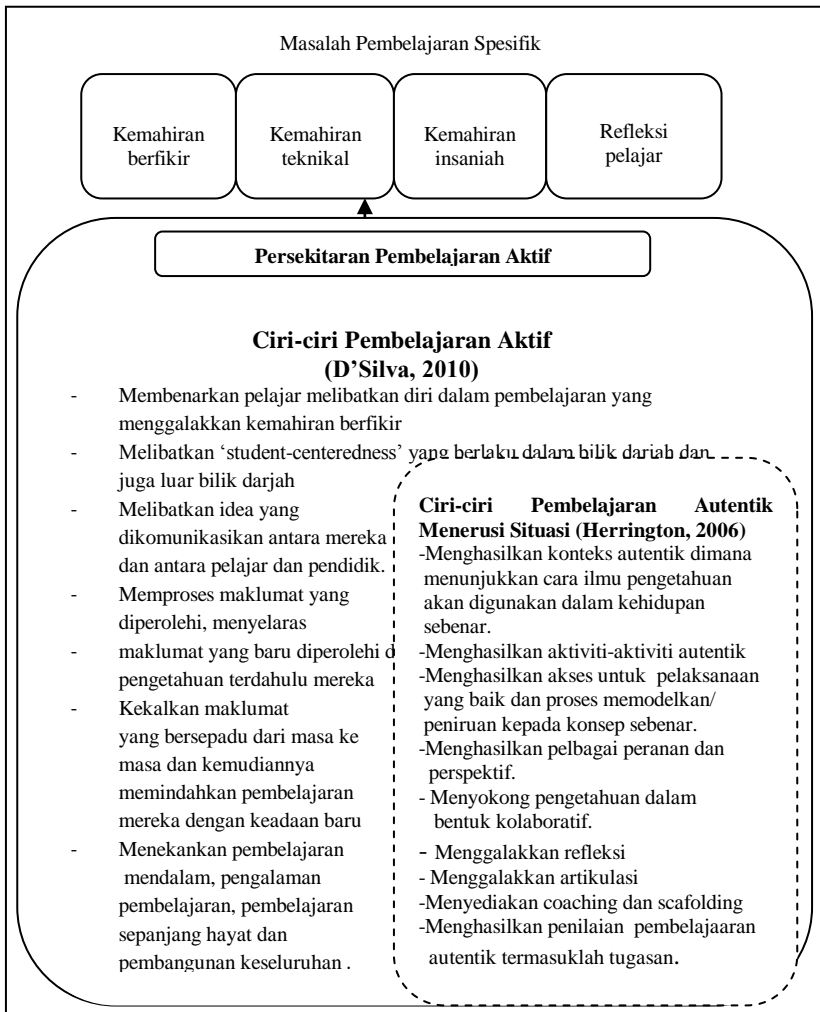
(2011) mencadangkan campuran persekitaran pembelajaran melalui persekitaran pembelajaran dalam talian (bervisual), yang melibatkan pengajaran bersemuka melalui web atau komponen secara maya ini merangkumi sistem yang dinamik yang memudahkan dan menyokong penglibatan pelajar.

KERANGKA KONSEP

Dalam kajian ini melibatkan kedua-dua ciri-ciri pembelajaran aktif dan ciri-ciri persekitaran pembelajaran autentik menerusi situasi yang diguna pakai untuk mewujudkan satu persekitaran pembelajaran yang berkesan bagi pelajar bermasalah pembelajaran spesifik. Pembelajaran aktif merupakan strategi pembelajaran yang diketengahkan melalui kajian Prince (2004), kemudian diguna pakai dalam kajian Auster (2006), Knapper *et al.*, (2007) dan Chambers (2009). Walau bagaimanapun, penggunaan ciri-ciri pembelajaran aktif dalam pembelajaran diterangkan dengan lebih mendalam melalui kajian Silva (2010). Manakala, bagi persekitaran pembelajaran autentik menerusi situasi, kajian terhadap persekitaran pembelajaran ini telah dijalankan oleh penyelidik terdahulu seperti Herrington dan Herrington (2006) serta Herrington (2006). Justeru, ciri-ciri persekitaran pembelajaran autentik menerusi situasi yang diguna pakai dalam kajian Herrington (2006), diadaptasi ke dalam kajian ini sebagai menyokong kepada pembelajaran aktif. Lanjutan daripada penggabungan strategi pembelajaran aktif dan persekitaran pembelajaran autentik menerusi situasi, elemen seperti teknologi diselitkan bagi memaksimumkan penglibatan pelajar dalam aktiviti yang dirangka. Penggunaan aplikasi web adalah sebagai salah satu alat untuk membentuk pembelajaran bersifat realistik dan menarik minat untuk terus fokus terhadap pembelajaran melalui aktiviti yang berasaskan situasi permasalahan secara berperingkat.

Oleh demikian, pelajar bukan sahaja diberi peluang untuk menggunakan kemudahan teknologi iaitu aplikasi web sebagai

medium pembelajaran. Menurut, Yang, Huang, Tsai, Chung, & Wu (2009), kandungan multimedia berbanding teks tradisional berasaskan pembelajaran adalah lebih berguna untuk pembelajaran dan pengajaran. Oleh kerana itu, aplikasi berdasarkan Web telah menjadi satu platform yang standard untuk pendidikan jarak jauh sejak awal tahun 2000 (Chen, Lambert & Guidry, 2010). Rajah 1.1 menunjukkan pembentukan kerangka konsep bagi kajian ini.



Rajah 1.1: Kerangka Konsep

Pembelajaran Aktif

Kajian ini adalah berdasarkan kepada teori pembelajaran aktif yang diketengahkan oleh beberapa penyelidik terdahulu seperti Prince (2004), Auster (2006), (Knapper *et al.*, (2007) dan Chambers (2009) yang diguna pakai untuk pelbagai bidang kajian. Kemudian kajian terhadap pembelajaran aktif dilakukan oleh Silva *et al.*, (2009) dan seterusnya ciri-ciri pembelajaran aktif diterangkan dengan lebih mendalam melalui kajian Silva (2010). Ciri-ciri dalam pembelajaran aktif dijadikan sebagai domain dalam membentuk aktiviti pembelajaran pelajar di sekolah mahupun di peringkat pengajian yang lebih tinggi.

Menurut Silva (2010), pembelajaran aktif boleh berlaku sama ada di dalam mahupun di luar bilik darjah dimana ia adalah untuk melibatkan diri pelajar dengan idea-idea yang telah dibincangkan di kalangan mereka yang berlaku di antara pelajar dan pendidik. Pembelajaran aktif itu sendiri merujuk kepada model pengajaran atau strategi pengajaran yang memfokuskan kepada pelajar. Sehubungan dengan itu, pembelajaran aktif melibatkan pembelajaran yang berpusatkan pelajar di mana, pelajar memainkan peranan penting dalam aktiviti yang dijalankan di dalam kelas dan membenarkan mereka untuk mencari atau bertanyakan sendiri tentang apa yang mereka ingin dapatkan. Ini disokong oleh kenyataan Knapper (2007) bahawa, dengan pembelajaran aktif, pelajar tidak hanya mendengar pengajaran guru di hadapan tetapi melibatkan diri dalam melontarkan idea yang dibincangkan dan mengintegrasikan maklumat yang diperolehi dengan pengetahuan sedia ada ke dalam situasi baru. Manakala, Silva (2010) & Beer *et al.*, (2010) pula menyatakan bahawa fokus pembelajaran aktif yang membentuk pemindahan pembelajaran kepada situasi baru dan peristiwa adalah penilaian sendiri dan refleksi terhadap apa yang berlaku serta peningkatan kepada keperluannya.

Berikut dinyatakan ciri-ciri bagi pembelajaran aktif yang dihuraikan oleh Auster (2006), kemudian dikemaskini oleh Knapper

(2007) untuk melibatkan pelajar melalui pembelajaran aktif dan seterusnya dihuraikan dengan lebih mendalam bagi setiap elemen yang ditekankan dalam pembelajaran aktif oleh Silva (2010). Kajian daripada Silva (2010) lebih berfokuskan kepada pengajaran dan pembelajaran yang melibatkan ciri-ciri pembelajaran aktif.

- i. Membenarkan pelajar melibatkan diri dalam pembelajaran yang menggalakkan kemahiran berfikir
- ii. Melibatkan ‘student-centeredness’ yang berlaku dalam bilik darjah dan juga luar bilik darjah
- iii. Melibatkan idea yang dikomunikasikan antara mereka dan antara pelajar dan pendidik.
- iv. Memproses maklumat yang diperolehi, menyelaraskan maklumat yang baru diperolehi dengan pengetahuan terdahulu mereka
- v. Kekalkan maklumat yang bersepadu dari masa ke masa dan kemudiannya memindahkan pembelajaran mereka dengan keadaan baru
- vi. Menekankan pembelajaran mendalam, pengalaman pembelajaran, pembelajaran sepanjang hayat dan pembangunan keseluruhan

Berdasarkan ciri pembelajaran aktif yang kedua, pembelajaran aktif yang melibatkan pembelajaran berpusatkan pelajar memakimumkan pembelajaran melalui “pembelajaran autentik” di mana, pelajar terlibat dalam proses inkuiri yang bersifat situasi sebenar (Newmaster et al., 2006). Oleh yang demikian, kajian ini juga akan mengimplementasikan ciri-ciri autentik menerusi situasi sebagai pelengkap dan sokongan kepada aktiviti pembelajaran aktif yang akan dilaksanakan

Pembelajaran Autentik Menerusi Situasi

Kajian autentik telah lama diguna pakai dalam pengajaran dan pembelajaran di sekolah mahupun di pusat-pusat pengajian tinggi. Ia telah diketengahkan oleh penyelidik terdahulu dan telah

dilakukan penambahbaikan mengikut beberapa penyelidik lain (Noor Azean, 2012).

Pembelajaran autentik merupakan pembelajaran yang berasaskan pembelajaran dalam persekitaran yang memfokuskan kepada dunia sebenar, aktiviti berasaskan masalah, kajian kes, masalah kompleks dan penyelesaiannya serta penglibatan dalam komuniti maya (Lombardi, 2007). Manakala, Herrington (2006) berpendapat bahawa, pelajar sebenarnya secara tidak langsung terlibat dengan masalah realiti apabila pembelajaran itu adalah bersifat autentik. Pelajar diberi peluang untuk membuat hubungan antara pengetahuan sedia ada pelajar dengan bahan baru yang dipelajari. Dengan itu, motivasi dalam diri seseorang pelajar itu dapat dipertingkatkan untuk terus belajar, memahami dan mengimplementasikan sesuatu konsep itu pada konteks yang sebenar.

Terdapat sembilan ciri-ciri bagi pembelajaran autentik menerusi situasi akan diguna pakai dalam kajian ini. Ciri-ciri berikut merupakan huraian Herrington (2006) yang telah dikemaskini dan lebih berfokuskan kepada aktiviti pengajaran dan pembelajaran yang bersesuaian. Ciri-ciri pembelajaran menerusi situasi serta garis panduan pengimplementasiannya adalah seperti berikut:

- Menghasilkan konteks autentik di mana menunjukkan cara ilmu pengetahuan akan digunakan dalam kehidupan sebenar.
 - Berdasarkan kepada persekitaran fizikal yang menunjukkan keadaan sebenar, reka bentuk yang tidak linear dan menyediakan sumber rujukan yang pelbagai.
- Menghasilkan aktiviti-aktiviti autentik
 - Menerusi aktiviti yang relevan dengan dunia sebenar, aktiviti yang tidak dihuraikan dengan lengkap/sedia ada (ill-defined), memberi tugasan yang kompleks, memberi peluang kepada pelajar untuk memahami tugasan, masa yang cukup untuk mengkaji, peluang untuk mengenal pasti maklumat yang relevan, peluang untuk bekerjasama dan tugasan yang boleh diintegrasikan kepada pelbagai situasi.

- Menghasilkan akses untuk pelaksanaan yang baik dan proses memodelkan/ peniruan kepada konsep sebenar.
 - Merujuk kepada penggalakkan pemikiran kritis dan proses memodelkan atau meniru sesuatu daripada keadaan sebenar, membenarkan mereka belajar pada pelbagai aras kebolehan dan berkongsi cerita.
- Menghasilkan pelbagai peranan dan perspektif
 - Merujuk kepada pelbagai perspektif terhadap sesuatu perkara itu serta menggalakkan pelbagai pendapat selain peluang untuk menunjukkan pelbagai pandangan dan persilangan unjuran respon.
- Menyokong pengetahuan dalam membentuk kolaboratif.
 - Pemberian tugas yang menjurus kepada aktiviti berkumpulan berbanding individu, organisasi bilik darjah dalam bentuk kumpulan-kumpulan kecil dan struktur insentif yang bersesuaian untuk pencapaian berkumpulan secara keseluruhan.
- Menggalakkan refleksi
 - Galakkan adalah melalui tugas dari sudut konteks autentik, navigasi yang pelbagai dan peluang kepada pelajar untuk membandingkan/ menunjukkan perbezaan secara positif.
- Menggalakkan artikulasi
 - Mampu menerangkan/ membentangkan tugas yang kompleks dalam penyampaiannya, kumpulan yang cekap mengendalikan penyampaian, persembahan awam berbentuk perdebatan bagi mempertahankan pembelajaran.
- Menyediakan coaching dan scaffolding
 - Implementasi melalui Persekitaran pembelajaran yang kompleks dan terbuka, reka bentuk multimedia yang pelbagai, panduan untuk menggunakan program dalam pelbagai konteks dan sokongan daripada pensyarah yang bersesuaian dengan pengajaran.
- Menghasilkan penilaian pembelajaran autentik termasuklah tugas.
 - Berdasarkan kepada ketepatan konteks, peluang kepada

pelajar untuk memperbaiki persembahan dan hasil, masa yang bersesuaian kepada pelajar dan usaha secara kolaboratif, kompleks dan cabaran secara tidak berstruktur, penilaian yang mengintegrasikan bersama dengan aktiviti yang dijalankan, pelbagai penunjuk pembelajaran, kesahan dan kebolehpercayaan dengan kriteria untuk mencapai hasil yang dikehendaki.

KESIMPULAN

Dengan pengintegrasian elemen teknologi ke dalam pembelajaran yang bersifat aktif melalui persekitaran autentik ini, pelajar yang bermasalah pembelajaran spesifik tidak mempunyai alasan untuk tidak berminat bagi meneruskan pembelajarannya di sekolah kerana ciri-ciri yang diketengahkan melalui pembelajaran aktif dan persekitaran pembelajaran autentik adalah lebih bersifat realistik dan dekat dengan pelajar. Pelajar diberi peluang untuk merasai sendiri pengalaman pembelajaran mereka bentuk melalui aktiviti di dalam kelas bersama rakan-rakan sebayanya tanpa rasa rendah diri atau kurang bermotivasi.

Oleh yang demikian, guru dan pelajar hendaklah senantiasa bekerjasama dalam menjayakan pengajaran dan pembelajaran ini supaya kesemua pelajar tidak kira pelajar bermasalah pembelajaran atau tidak mendapat ilmu yang sama dan bergerak seiring dalam mengejar cita-cita masing-masing.

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MENINGKATKAN KEMAHIRAN BERFIKIR ARAS TINGGI DALAM TOPIK PECAHAN

Nur Liyana Zainal Abidin & Abdul Halim Abdullah

ABSTRAK

Punca kegagalan pelajar tidak menguasai kemahiran berfikir aras tinggi (KBAT) dalam topik Pecahan apabila pelajar melakukan kesilapan dalam menyelesaikan masalah matematik dan mempunyai visualisasi yang rendah. Punca tersebut disebabkan oleh strategi pengajaran yang kurang efisien dan efektif. Justeru itu, Kementerian Pendidikan Malaysia (KPM) telah mengambil pendekatan dengan memperkenalkan Thinking Blocks yang mana telah digunakan secara meluas di seluruh sekolah di Singapura. Thinking Blocks merupakan suatu alat kognitif yang dapat membantu pelajar dalam proses pengajaran dan pembelajaran (PdP) Pecahan. Kertas konsep ini akan mengupas dengan lebih lanjut hubungan antara kesilapan yang dilakukan oleh pelajar dengan KBAT dan juga hubungan antara visualisasi dengan KBAT. Di akhir kertas kerja, penggunaan Thinking Blocks dikatakan membantu untuk mengatasi masalah yang dihadapi oleh pelajar

Kata Kunci: Kemahiran berfikir aras tinggi, kesilapan, visualisasi

PENGENALAN

Salah satu matlamat kurikulum matematik di Malaysia adalah untuk melahirkan individu yang mempunyai pemikiran matematik dan menggunakan pengetahuan dan kemahiran matematik secara

berkesan (KPM, 2003). Oleh itu sebagai agen perubahan, guru memainkan peranan yang penting dalam merealisasikan matlamat pendidikan matematik negara. Hal ini penting untuk menyediakan generasi akan datang yang mampu menghadapi cabaran dalam kehidupan seharian kesan daripada kemajuan sains dan teknologi. Pengetahuan dan kemahiran matematik yang perlu dikembangkan dan disemai dalam diri pelajar merangkumi numerasi, manipulasi aritmetik dan algebra serta penggunaan algoritma (KPM, 2011).

Pecahan merupakan salah satu topik yang disenaraikan penting dalam bidang pembelajaran matematik. Kepentingan Pecahan dalam bidang matematik adalah untuk membangunkan dan membentuk idea matematik untuk digunakan dalam kehidupan seharian (Zakiah et al., 2013; Misquitta, 2011; Azlina et al., 2010; Butler et al., 2003). Selain itu, Pecahan adalah asas kepada pengenalan topik matematik yang lain contohnya algebra yang mana penting bagi setiap pelajar sekolah di peringkat rendah untuk menguasai topik Pecahan sebelum mempelajari algebra pada peringkat yang lebih tinggi (Zakiah et al., 2013). Groff (1997) menyatakan bahawa topik algebra mudah untuk dikuasai pelajar sekiranya guru mengajar topik Pecahan dengan sistematik dan intensif. Manakala Aida Suraya (1994) menyatakan asas dalam pembelajaran matematik adalah menguasai operasi asas iaitu Nombor Bulat, Perpuluhan dan Pecahan. Justeru itu pelajar perlu menguasai semua operasi asas matematik kerana asas pengetahuan operasi asas matematik dapat memberi struktur mental untuk pembangunan intelek yang berterusan (Zakiah et al., 2013).

Pecahan merupakan suatu nombor yang mempunyai sifat yang unik (Zakiah et al., 2013). Keunikan Pecahan menyebabkan kesukaran pelajar untuk memahami dan mempelajari isi kandungannya (Sean, 2005; Watanabe, 2002). Oleh sebab itu, pelajar tidak dapat menguasai makna sebenar Pecahan kerana mereka memiliki pemahaman konsep Pecahan yang rendah dan tahap penguasaan konsep Pecahan yang kabur (Zakiah et al., 2013). Memetik kenyataan Calik dan Ayas (2005), antara faktor yang menyebabkan pelajar tidak dapat menggunakan konsep yang

dipelajari ke dalam kehidupan seharian adalah kerana pelajar tidak dapat mentafsir dan menjelaskan asas bagi teori subjek tersebut. Hung et al. (2013) juga menyatakan bahawa kelemahan pelajar dalam menguasai konsep fizik dan matematik mengakibatkan pelajar tidak dapat menggunakan konsep tersebut untuk menyelesaikan masalah yang berasaskan kepada Sains, Teknologi, Kejuruteraan dan Matematik (STEM). Justeru itu, para pendidik perlu memainkan peranan yang penting untuk mendalami kesukaran dan masalah yang dihadapi oleh pelajar dalam pembelajaran matematik terutamanya dalam Pecahan.

LATAR BELAKANG MASALAH

Dalam melahirkan individu yang mempunyai pemikiran matematik, guru digalakkan untuk menggunakan pengajaran formal mengenai Kemahiran Berfikir Aras Tinggi (KBAT) di dalam bilik darjah (Nagappan, 2001). Bagaimanapun, pengajaran KBAT di dalam bilik darjah dilihat masih belum mampu untuk melahirkan minda pelajar ke arah kepelbagaian tahap berfikir, (Noor Rohana, 2009). Pelbagai pendekatan dan usaha perlu dilakukan oleh para pendidik dan pihak berkepentingan dalam bidang pendidikan untuk menyelesaikan segala permasalahan yang berlaku.

Pecahan & Kemahiran Berfikir Aras Tinggi (KBAT)

Berdasarkan pentaksiran antarabangsa *Trends in International Mathematics and Science Studies* (TIMSS) 2011 pencapaian pelajar menunjukkan kadar penurunan (Mullis et al., 2012). Pentaksiran peringkat antarabangsa TIMSS 2011 jelas menunjukkan pelajar di Malaysia sangat lemah dalam domain kognitif mengaplikasi dan menaakul (Mullis et al., 2012) yang mana domain kognitif yang diuji terdiri daripada item-item yang memerlukan pelajar menggunakan kemahiran berfikir aras tinggi

(KBAT). Pencapaian pelajar di Malaysia yang lemah dalam domain kognitif telah menggambarkan bahawa mereka tidak memiliki KBAT. Oleh itu, KBAT amat penting bagi mata pelajaran matematik kerana menjadi alat pengukur membantu pelajar untuk meningkatkan pencapaian dalam pentaksiran antarabangsa.

Selain itu, perbandingan diantara pencapaian pelajar di Malaysia pada TIMSS 2007 dan TIMSS 2011 dalam domain kandungan menunjukkan kadar penurunan yang sangat ketara (Mullis et al., 2012). Domain kandungan yang diuji merangkumi daripada empat bidang matematik iaitu Nombor, Geometri, Algebra, Data dan Kebarangkalian. Topik Pecahan terkandung di dalam, domain kandungan. Topik Pecahan dipilih untuk dikaji kerana Pecahan adalah asas dan kesinambungan kepada topik matematik yang lain. Tambahan pula, dalam pentaksiran antarabangsa TIMSS, domain Nombor dan Algebra merupakan domain yang paling kerap dinilai iaitu sebanyak 30% berbanding domain kandungan yang lain.

Amalan pengajaran dan pembelajaran bagi topik Pecahan di dalam Malaysia adalah tertumpu kepada penghafalan formula (Tengku Zawawi et al., 2009; Noraini & Narayanan, 2011). Situasi pengajaran tersebut tidak dapat memberi sebarang makna kepada proses pembelajaran. Selain itu juga boleh mengakibatkan kesilapan konsep dalam kalangan pelajar. Oleh itu tidak mustahil jika ada sebahagian pelajar menyatakan topik Pecahan ini sukar untuk dikuasai dan dipelajari. Pengajaran guru di dalam bilik darjah juga didapati kurang bertanyakan bentuk-bentuk soalan yang menuntut pemikiran aras tinggi (Sukiman et al., 2012). Situasi pengajaran tersebut tidak mampu untuk merangsang minda dan pemikiran pelajar malah mereka tidak berkesempatan untuk menyatakan pendapat, membuat kesimpulan dan menjana idea-idea baru.

Sebaliknya pengajaran dan pembelajaran bagi topik Pecahan di luar negara iaitu di Singapura telah menggunakan pendekatan heuristik iaitu *Model Method* (Cheong, 2002; Jiang & Chua, 2010). Mengikut Ho dan Lowrie (2014), *Model Method* dapat membantu pelajar kerana pelajar dapat menggambarkan permasalahan yang

berlaku. Kaedah *Model Method* ini juga dapat meningkatkan pemikiran pelajar. Hal ini kerana, strategi pengajaran dan pembelajaran tersebut mengkehendaki pelajar untuk melukis segi empat tepat bagi mewakili semua maklumat dan hubungan yang dinyatakan bagi menyelesaikan masalah. Strategi tersebut dapat membantu pelajar untuk memahami masalah yang diberikan dengan lebih jelas dan sekaligus menyelesaikan masalah pada pelbagai tahap.

Analisis Kesilapan & Kemahiran Berfikir Aras Tinggi (KBAT)

Antara usaha untuk membangunkan pemikiran matematik pelajar adalah dengan mengenal pasti punca-punca kesilapan atau kesalahan dalam pembelajaran matematik dengan terlebih dahulu. Dengan menganalisis kesilapan pelajar melalui jalan kerja penyelesaian masalah matematik, tahap pemikiran mereka dapat ditentukan. Mengikut Shong et al. (2013), kajian perlu dilakukan bagi mengenal pasti corak kesilapan dan kesalahan yang dilakukan oleh pelajar. Zakiah et al. (2003) juga menyatakan bahawa dengan kenal pasti kesilapan yang sering dilakukan pelajar, guru dapat menentukan tahap penguasaan sebenar dan corak kesilapan mereka.

Menurut White (2010), Analisis Kesilapan Newman merupakan salah satu alat diagnostik yang dapat menentukan “di mana” dan “kenapa” pelajar melakukan kesilapan dalam matematik. Analisis Kesilapan Newman mempunyai hierarki tertentu dan setiap jenis kesilapan adalah berdasarkan tahap penyelesaian masalah seperti di Jadual 1(a) (Effandi & Siti Mistima, 2010). Jika dilihat, proses untuk menyelesaikan masalah matematik mengkehendaki pelajar memahami maksud soalan dalam konteks matematik sebelum mereka meneruskan proses matematik yang seterusnya bagi mendapatkan jawapan. Maka, Analisis Kesilapan Newman memberi peluang kepada para guru untuk melakukan diagnostik bagi mengenal pasti dan merekod kesilapan yang dilakukan oleh pelajar.

Jadual 1(a) Peringkat dalam Analisis Kesilapan Newman

Bil	Peringkat Newman
1	Membaca: pengecaman ringkas mengenai ayat-ayat dan simbol-simbol.
2	Kefahaman: memahami apa yang dibaca.
3	Transformasi: menjalankan transformasi mental daripada masalah kepada pemilihan strategi matematik yang sesuai.
4	Kemahiran proses: Pelaksanaan proses matematik
5	Encoding: Keputusan daripada proses matematik

Sumber: Parkitpong & Nakamura (2006)

Visualisasi & Kemahiran Berfikir Aras Tinggi (KBAT)

Menurut Tambychik dan Meerah (2010), visualisasi merupakan salah satu kemahiran matematik yang membantu pelajar dalam menyelesaikan masalah matematik. Visualisasi dalam matematik dapat ditakrifkan sebagai kebolehan untuk mencipta, mentafsir, menggunakan dan mencerminkan imej di dalam minda, di atas kertas atau dengan alat-alat teknologi (Arcavi, 2003). Rafi et al. (2008) mendefinisikan kemahiran visualisasi sebagai keupayaan kognitif untuk melakukan kerja-kerja harian dan sangat penting dalam bidang pendidikan kerana membantu pelajar - pelajar di dalam pembelajaran. Dengan adanya seseorang individu dengan kemahiran visualisasi, mereka berpeluang untuk melihat fizikal objek tersebut dan perwakilan gambar dengan penuh bermakna. Individu tersebut juga dapat menghubungkan konsep-konsep abstrak yang ada dalam kurikulum matematik. Menurut Van Garderen (2006), kemahiran visualisasi amat penting dalam pengajaran dan pembelajaran matematik terutamanya semasa menyelesaikan masalah kerana membantu pelajar dalam menganalisis, membezakan, menghubungkan dan menyusun maklumat secara bermakna. Justeru itu, setiap individu perlu memiliki kemahiran visualisasi dalam meningkatkan prestasi

matematik.

Antara kepentingan kemahiran visualisasi di dalam matematik adalah membantu untuk meningkatkan KBAT pelajar. Kajian yang dilakukan oleh Samsudin & Fatimah (2004) mendapati bahawa pelajar telah menggambarkan imej visual seperti melukis lakaran dan membina perlembangan untuk mengenal pasti operasi yang terlibat, mengenal pasti matlamat dan keperluan soalan dan menjadikan tugas untuk memahami soalan dengan mudah. Dua kemahiran yang penting dalam menyelesaikan masalah adalah dengan melukis lakaran dan membuat penaakulan yang betul (Nik Azis, 1996) sekaligus dapat merangsang KBAT. Sekiranya proses penaakulan dapat dilakukan, individu tersebut telah mencapai tahap KBAT. Hal ini kerana penaakulan terkandung di dalam taksanomi bloom yang mana penaakulan tergolong dalam pemikiran aras tinggi. Justeru itu, kemahiran visualisasi adalah penting dalam memupuk KBAT pelajar.

ALAT KOGNITIF & *THINKING BLOCKS*

Permasalahan yang dihadapi oleh pelajar dapat diatasi dengan penggunaan alat kognitif di dalam bilik darjah. Alat kognitif merupakan alat peranti mental dan pengiraan yang menyokong proses minda pelajar (Derry & LaJoie, 1993; Kommers et al., 1992). Mengikut Francaviglia dan Servidio (2011), proses pengajaran dan pembelajaran matematik dengan menggunakan alat kognitif dapat meminimumkan kesilapan pelajar seperti penukaran tanda apabila berpindah ke sebelah. Penggunaan alat kognitif juga dapat menjana pengetahuan prosedural seperti menambah dan menolak Pecahan melalui pembelajaran penerokaan (Kong, 2008) dan meningkatkan kemahiran pelajar dalam menyelesaikan masalah matematik melibatkan Pecahan (Azlina et al., 2004). Alat kognitif ini juga mempunyai ciri-ciri visual yang mana membantu pelajar untuk meningkatkan kemahiran matematik mereka seperti visualisasi. Menurut Isiksal dan Cakiroglu (2010), bahan

pembelajaran yang dilengkapi dengan ciri-ciri visual sangat penting kerana membantu pelajar mengatasi kesukaran dalam pendaraban Pecahan.

Penggunaan bahan bervisual dapat membantu guru dalam proses penyampaian isi kandungan pelajaran dan juga membantu pelajar agar mereka memahami isi kandungan yang disampaikan. Mengikut Ho (2010), peranan visualisasi dalam matematik adalah untuk memahami dan mempermudah masalah, sebagai pengganti untuk membuat pengiraan, untuk menyemak jalan penyelesaian dan untuk mengubah masalah ke dalam bentuk matematik. Penggunaan bahan bervisual dalam mewakili sesuatu situasi dan gambaran sebenar dapat membantu pelajar untuk meningkatkan kefahaman, daya pemikiran dan pengetahuan serta memberi pengalaman yang sebenar kepada pelajar (Kong, 2011). Hal ini kerana maklumat yang dipaparkan dalam bentuk visual dapat diterima oleh otak sebanyak 80%. Oleh itu, penggunaan bahan bervisual ketika proses pengajaran dan pembelajaran matematik adalah penting kerana memberi impak positif kepada pelajar, antaranya dengan memberi gambaran yang jelas untuk memahami sesuatu masalah yang diberikan dan membina konsep dalam matematik serta membina kemahiran seperti visualisasi dan KBAT.

Thinking Blocks diperkenalkan oleh Kementerian Pendidikan Malaysia (2013) sebagai salah satu alat kognitif matematik yang dapat membantu pelajar dalam pembelajaran matematik khususnya dalam topik Pecahan. Melihat kepada kajian-kajian yang lalu (Ho & Lowrie, 2014; Mahoney, 2012; Hoven & Garelick, 2007; Cheong, 2002) keberkesanan *Singapore Math Model Drawing System* tidak dapat disangkal kerana membantu pelajar di Singapura untuk menyelesaikan masalah matematik. *Thinking Blocks* juga telah memperkenalkan satu kaedah penyelesaian masalah matematik yang mana ayat-ayat matematik secara diskrit dapat diringkaskan dan difahami dengan mudah. Melalui *Thinking Blocks* ini juga pelajar dapat menggambarkan masalah yang diberikan secara visualisasi.

KESIMPULAN

Berdasarkan maklumat dan bukti yang dinyatakan sebelum ini, terdapat petunjuk bahawa kesukaran pelajar Malaysia dalam pembelajaran Pecahan dikaitkan dengan kelemahan pelajar dalam domain kognitif menaakul dan mengaplikasi. Domain kandungan menaakul dan mengaplikasi yang terkandung dalam komponen KBAT seharusnya dikuasai oleh pelajar Malaysia agar mereka memiliki pemikiran aras tinggi dan mudah mempelajari topik Pecahan. Terdapat juga petunjuk bahawa pelajar Malaysia lemah dalam domain kandungan nombor yang menyebabkan kesukaran mereka untuk mempelajari dan menguasai domain lain.

Kelemahan dalam domain kognitif dan domain nombor menyebabkan pelajar Malaysia melakukan kesilapan dalam menyelesaikan masalah melibatkan Pecahan. Oleh itu usaha untuk mengatasi kesukaran pelajar dalam pembelajaran Pecahan perlu dilakukan dengan mengenal pasti jenis-jenis kesilapan yang sering dilakukan oleh pelajar. Sementara itu, penggunaan alat kognitif iaitu *Thinking Blocks* dalam pembelajaran berpotensi untuk memperbaiki kesilapan pelajar dengan adanya bahan bervisual yang mana membantu pelajar untuk memahami dengan lebih jelas maklumat matematik.

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A REVIEW OF STUDIES ON THE USAGE OF BLOG IN TEACHING AND LEARNING

Nur Lidiana Edyanti Mohd Esa & Zaidatun Tasir

ABSTRACT

The popularity of studies on the usage of blog in teaching and learning is undeniable. There are numerous studies on the usage of blog in teaching and learning which demonstrate the increased interest on blogging research among researcher. Conversely, there has been a significant decline of interest on the usage of blog in teaching and learning since there is still lack of research that incorporated an appropriate learning activities and the strategies. Nevertheless, the combination of these two elements would enhance student performance on blogging in science and math as well as assist students to understand highly this conceptual subject. However, researchers face some challenges in integrating appropriate blogging activities into an educational setting (Halvorsen,2012). Additionally, some argue that learning theories are often to broad to be implemented on blogging (Nikleia et al.,2013). Therefore, this conceptual paper provides a review on the usage of blog in teaching and learning, especially on those that integrated with learning activities and strategies.

Keywords: Blog, Blog Usage, Teaching and Learning

1.0 INTRODUCTION

Blog provides a platform for students to do reflections on their understanding towards learning. Studies on the usage of blog in teaching and learning are becoming popular due to the potential of blog in enhancing student performance. Therefore, there is a need to analyze the existing research findings on the use of blog in education. This paper will review few studies on the usage of blog in teaching and learning. It emphasizes that the usage of blog in teaching and learning is critical. Hence, teachers and students should place themselves in a position from which they are able to provide and share the knowledge and ideas to support the effort on the usage of blog in teaching and learning.

Why should blog have been used regularly in education specifically in teaching and learning? Does blog have its own attractions that can fulfill educators intend on sharing their desirable knowledge to others? The review on selected of 55 article journals will reveal the secret of blog and blogging. A blog can be traced as the place that we can share any knowledge to be spread out to others (Anderson et al., 2013). Further, it is a social networking medium that comes with a real high impact to the users. Hence, in using blogs, the writer can add in or fill up the most recent issues, knowledge, information and laws to the public that reads his or her blogs (Nikleia et al., 2013).

Blog is a most simple Web 2.0 application that can be easily accessed with less obstacles and it is suitable for all ages of users. Although, some blog needs permission for user to read all the articles written by the blogger, there are many other blogs that are free and more informative. With more selections of blogs, students face challenges in selecting and assessing the accuracy and validity the content of the blog. Therefore, teachers should teach students skill in reviewing the blog contents. Furthermore, the purpose of the teacher is to ensure those educational blogs published must be enforced with the proper path with the right guidance of an instructor in fostering the best teaching practice outside the

classroom for the students (Farmer et al.,2008).

2.0 RESEARCH BACKGROUND AND PROBLEM STATEMENT

Blog is a medium that can be browsed by everyone in getting the information either it is a fiction or non-fiction material. Through this research, we are going to review studies on the usage of blog in teaching and learning. The blog is a well-known medium in education in sharing the knowledge among students and teachers. Moreover, blogging can be deemed to be an important medium for effective learning if appropriate activities and learning theory of blog in teaching and learning are used. The popular usage of blog in teaching and learning nowadays has prompted the demand for delivery structures and pedagogical patterns that most appropriate. Most of the instructors receive a singular opportunity to foster an interaction and collaboration among their students respectively by creating the learning communities (Blood, 2002).

Lately, blog have helped the establishment of online users and extensive online communities in educations, which originally it did as a personal journaling tool. Hence, the teachers will use most appropriate ways in blogging such as discussion boards in guided discussions, technological tasks in exchanging the ideas, limited in-class conversations and observations of students' behaviors in educational blogging (Shiang and Hsua, 2008). However, utilizing blog in education require in depth understanding of learning theory structure and learning concept by teachers. Besides that, blog that being utilized with multiple multimedia elements such as audio, video, pictorial and animation will help students to entertain their learning process effectively.

3.0 RESEARCH OBJECTIVES

This study embarks on the following objectives:

- i. to identify the number of study area and level of respondent involved in research on the usage of blog in teaching and learning.
- ii. to identify the activities that have been applied in research on the usage of blog in teaching and learning.
- iii. to identify the dominant learning theory that have been focused by most research on the usage of blog in teaching and learning.

4.0 RESEARCH METHODOLOGY

The reviewed of studies on the usage of blog in teaching and learning have been retrieved as the title and keywords stated. The research paper that were published, original and empirical papers, as well as papers containing the implementation of constructivism learning theory in science and mathematics for secondary school students. The studies have reviewed on the published paper since the year 2004 until the end of 2012, as stated in the Table 5.1 were selected in this study. This method also may exist any limitation due to limited years and relevant meta-analyses. The procedure of this meta-analysis is based on the previous review by (Kempton et al., 2008). The terms of Learning through blog, Blogging in teaching and learning, Learning theory in science and math through blogging, Active learning in blogging, Blogging in education, Blogging in the classroom, Weblogs, Blogging on establishing communities, Creating blogs in writing course, Using blogs as students teachers assessments and e-portfolio and most of the terms were used via databases such as JITE, AJET, SAGE Journal, EBSCOHOST, IEEEExplore Digital Library, Web of Science

ScienceDirect and ProQuest.

5.0 FINDINGS

As results of the reviewed that have been done, findings of studies on the usage of blog in teaching and learning have been retrieved as follow.

5.1 Number of research concentrated on blogging

Studies related to the number of research concentrated on blogging stated in the Table 5.1. It shows there are an increasing number of studies from 2004 to 2012 on the usage of blog in teaching and learning respectively. Moreover, the awareness on using blog has been absorbed positively to making meaning of effective method in teaching and learning. The increasing number of research is an important information for the researchers, who intent to focus on research of blog in teaching and learning. A different number of researches between the years 2004 to 2012 shows that the finding has been retrieved to fill the gaps and refine the studies on the usage of blog in teaching and learning.

Year	Number of research concentrated on blogging
2004	1
2005	1
2006	1
2007	5
2008	8
2009	5
2010	12
2011	7
2012	15
TOTAL	55

Table 5.1: Number of research concentrated on blogging

5.2 Level of respondents and Study Area on the usage of blog in teaching and learning

Table 5.2 shows the level of respondents in studies reviewed. The less number of respondents due to this study goes to the secondary schools students. Based on the literature that has been done, there are only 7 studies involving secondary school students. The number of undergraduate student involved in research conducted was the highest among the other level of respondents. Based on positive results showed from the previous studies, it proves a positive contribution of research held on the undergraduate students. To balance the harmonic of this study, it is good to conduct a research of blog usage in teaching and learning among secondary school students. This will give a chance for them to experience the use of blog in teaching and learning.

Level of respondents	Frequencies of article journals
Postgraduates	10
Undergraduates	34
Secondary School	7
Public	8
Trainee	8
Total	55

Table 5.2 : Category of respondents

As many researchers have pointed out, the link between the studies areas on blogging could be strengthen because a specific allocation of studies areas that can be used for research incorporated. Table 5.3 shows the results of study area research conducted previously. Study area for science and technology has 23 researches, which is the highest number among the rest. Social science and arts has 18 research goes on it while 14 researches is going to language study area. These differences will be the appropriate reason on how to get the most catchy and valuable study in the future.

Study Area	Frequencies of article journals
Social Science and Arts	18
Science and Technology	23
Language	14
Total	55

Table 5.3 : Study Area on blogging

5.3 Learning Activities applied on blogging the usage of blog in teaching and learning

Based on the previous literature review, the activities listed in the table 5.4 showed that the activities for instructions and reflection has the top activities applied on blogging. This attribute refers to ensuring knowledge that students gained understanding in learning are appropriate with the usage of blog in teaching and learning. Practice and discussion referred to 19 research conducted reflects as a good activities on blogging preferable by the researcher. Moreover, it proves that both activities presented a positive stimulus to access student performance on blogging.

Learning Activities	Frequencies of article journals
Demonstrate and Listening	10
Practice and Discussion	19
Experience and Observing	10
Inquiring and Interview	10
Instruction and Reflection	26
Total	55

Table 5.4 : Learning Activities applied on blogging

5.4 The dominant learning theory used on blogging the usage of blog in teaching and learning

Applying learning theories and strategies in developing any application of learning instruction is necessary. Table 5.5 shows that constructivist learning theory researches are 27. Almost half of learning theory on blogging used constructivist in developing a proper structure of learning principles. In this study, the dominant learning theory of instruction is merged as framework for the study. However, the process of merging the dominant learning theory and its principles is an issue that is yet to be solved to enhance learning performance among the students.

Theory	Frequencies of article journals
Behaviorist	9
Constructivist	27
Cooperative	9
Cognitive	10
Total	55

Table 5.5 : Learning Theory

6.0 DISCUSSION

Blog in education has been used for many years and its benefits had been documented by the researchers effectively (Savas, 2013). According to Huffaker (2005) cited in Savas (2013), blogs could be utilized to encourage reading and writing, to showcase the work of students, and exchange ideas among students, teachers or school administrators. Moreover, in education, blogs can also be used to enhance the fluency in writing in both, local and foreign languages (Savas, 2011). Blogs are also the most appropriate medium in educating student-teacher learning because of its simplicity of use and incorporation of various resources such as multimedia, socialization and individualizations (Huang, 2013). There are many advantages of using blogs in education in delivering formal and

non-formal learning contents (Huang, 2011; Lin & Kao, 2010).

The role of educational blogs should be managed in a systematic manner to optimize the efficiency in delivering information to students. Blogging can be a more interesting medium in education if it is emerged within the accessibility of social applications on the internet and its consistency to modern learning theories (Fessakis, 2013). According to Han and Bhattacharya (2001) cited in Fessakis (2013), there are several views that constitutes learning through blogging in education including its environment, authenticity of the theme design, a balance mixture of constraining, discussion, collaboration, inquiry and self-reflection. Blogging will allow students-teachers interactions and collaboration to take place by fostering activities that are designed effectively with regards to the subject matter (Fessakis et. al., 2008).

Wickersham and Chamber (2006) cited in Huang *et al.* (2013) concluded that learning is best facilitated in contexts that include hands-on, experiential opportunities and high degrees of student participation, interaction with peers and student-teacher communication. Internet-based communication technologies allow educators to produce these kinds of learning settings. These settings are more focused on informal learning environments where students will socialize with their colleagues in learning a certain concept. Blogs are an additional tool now that is being used to facilitate online learning, as they allow students to develop, publish and organize knowledge in their own place. The purpose of blogs is to hive away and record information, share, and save observations (Blood, 2002). Besides that, blogs can also encourage the communion of ideas and collaborations. In addition, blogs support the implementation of in social constructivism in teaching and learning. Blogs create a sense of interactivity that leads to social structure of meaning where students can communicate with other students, teachers and professionals in the community.

Web blogs can also provide students with access to many different types of information resources that help them realize the culture of others. Moreover, blogs are a networked writing

program where it furnishes a unique program of collaborative authorship. Students can write for real audiences who respond instantly and who take part in the collective writing activities. In the social constructivism environment, educators create a learning context in which students can get absorbed in interesting activities that encourage and facilitate reading. The educator does not have to be there, but he or she needs to watch students' exploration and discovery of knowledge. On the other hand, the educator needs to lead and help students as they approach problems, encourage them to go in groups to conceive around issues and questions, and most importantly is to support them with encouragement and advice as they tackle problems, adventures and challenges.

As for educators, blogging can be utilized to make student work public, to promote student reflection, to capture accumulated knowledge, and to create space for feedback from a bigger community (Ferdig & Trammell, 2004). In order to interpret and reflect the concept in blogs, students have to use proper metacognitive strategies. Metacognitive is thinking about thinking (Flavell, 1978), therefore metacognitive strategies are more focused on thinking strategies of thinking where it can activate one's thinking and lead to improved learning performance in general (Anderson, 2013).

According to Pressley *et al.* (1987) cited in Huang *et al.* (2009), metacognitive strategies are potentially conscious and controllable. Usually, in learning, students will not think about their thinking when performing certain tasks. They will automatically employ their metacognitive strategies to the learning problem, study the problem, and react towards any circumstances while working out the trouble. All the same, when asking to explain and reflect on how they worked out the trouble and what processes they had gone through, they can commonly describe their metacognitive process and strategies slowly. These students can be categorized as those who have developed their knowledge and understanding in their awareness, and they can supervise their own learning progress easily.

The learning theory and strategies should be studied among other students who are not able to crack their thinking awareness yet. According to O'Malley *et al.* (1985) cited in Regina (2010), learners without the understanding, thinking and knowledge of awareness have no direction or ability to monitor their progress and future learning directions. However, apprentices who have developed their thinking awareness are likely to become more independent in their own learning. Using blogs in learning requires learners to be independent in their own learning is supported by Ellison and Wu (2008) whom suggested that blogging gives learners more responsibility for their own learning.

The use of blog among students nowadays is widespread. Based on a study done by Nurul Izzah and Zaidatun (2009), it was found that university students' perceptions towards the usage of blogs in learning activities are positive. Students frequently wrote and shared information in blogs when they aware that their reflections and posts will be evaluated by their lecturers. Results from a study by Farmer *et al.* (2008) showed blogging to be an enabling learning tool in higher education. Stiller and Philleo (2003), explored the use of blogs in the pre-service education and marked that the depth and breadth of students reflectivity were positively affected through blogging.

There is an immense number of reviews and analysis of processes and strategies through blogging. The discussion on processes linked to effective blogging activities, and dominant learning theory through blogging have been revealed generally by researchers. Therefore, for upcoming future studies towards effective learning process and strategies through blogging should explore these issues at a deeper level:

- i. The number of secondary school as student respondents was the least in this research. Hence, a larger sample of them in the future research will give a positive contribution in secondary education effectively.
- ii. Most of the researchers applied instructions, reflections, practice and discussion. They did not randomize the

activities listed creatively. Hence, add on activities must be considered to be used in upcoming research.

- iii. The present study argues that the constructivist learning theory is most suitable in explaining educational blogging, and does not give much consideration to student behavior and cooperative learning. It seeks to find the most effective learning process and strategies through blogging.
- iv. Referring to the table 5.3, science and technology is a wide field that requires in depth exploration to support the needs of secondary students' profiles as respondents, therefore, multiple add on activities that make up a blog medium should be assessed together with the suitability of the learning theory.

7.0 CONCLUSION

Blogging in the educational setting among colleagues, teachers and other bloggers can provide a salient reading to advance students professional skills and giving an extraordinary resource in achieving their higher order thinking skills at the top level (Lina Lee, 2010). This implication of blog practice in learning mode will engage students in critical thinking with their degree of reading freedom; hence, it provides them with questions, replying points of thoughts and creating a great forum of discussion respectively (Regina D. Royer, 2010). Besides that, the statement of problems and objectives of the research, have to be explained clearly. More research on effective pedagogy through blogging is needed to educate students to modify their perceptions and motivation in the most proper way.

The aim of this present study is to develop pedagogy through blogging (Pedabloggy) that enhance learning among secondary school students. This is important in this dissertation as the main point is to develop learning activities based on reflections and discussions, and to identify reflections and discussions based on

the performances of self. Hence, students' perceptions and motivation can be evaluated through blogging. In all, this concept paper is aimed to review studies investigating the usage of blogs in teaching and learning. Most importantly, this study has identified and discussed the potential activities and the dominant learning theory that will enhance students' performances in blogging. The proposed activities and dominant learning theory can be used to implement blogging in teaching and learning. However, further studies are needed to prove the effectiveness of these activities and dominant learning theory.

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CHALLENGES ENCOUNTERING CAREER DEVELOPMENT OF WOMEN IN ADMINISTRATIVE POSITION OF HIGHER EDUCATION IN DEVELOPING COUNTRIES

Bahieh Mohajeri & Mahani Mokhtar

ABSTRACT

Purpose – This paper attempts to set the stage for the exploration of female leadership in administrative position within non-western countries by reviewing the studies on women in administrative positions within non-western countries and suggesting guidelines for future studies in this area in developing countries.

Methodology – The paper is based on a systematic review of papers that have been published in journals.

Findings – The review focuses on challenges to women's career development in higher education in developing countries (e.g. strong family responsibility, low levels of women faculty members, social values and gendered cultural factors).

Practical implications – Further guidelines for future examination of this field of study are suggested (e.g. adopting a different theoretical view).

Value – The article is an initial attempt to gather knowledge about challenges of women administrators in higher education of developing countries. The subject has received less attention in studies on administration and gender. In addition, the article provides suggestions for future studies in order to understand female administrators' experiences in different educational and cultural settings.

Keywords: Administrative position, Female administrator, Developing countries, Career development.

1. INTRODUCTION

The managerial knowledge of gender in educational systems has progressed in developed countries, and studies conducted in this area have been marginalized in developing countries (Dimmock & Walker, 2005). In this sense, little is known about the career experiences and lives of female in administrative positions within developing countries. In recent years, a similar trend has characterized the research on women in administrative position of higher education (Bagilhole & White, 2011; Lie & Malik, 2014).

This article sets the stage for the investigation of female administrators in higher education in developing countries comparing between developing and developed countries in terms of cultural and social setting, and social perceptions of gender. Specifically, as cultural contexts impact women academician sets of values, attitudes and norms for behavior (Akpınar-Sposito, 2013; Aslanargun, 2013).

Developing countries that have been experiencing quick modernization processes in recent years have much influence upon employment opportunities for women and their professional development that might increase the number of women in teaching and administrative positions within many developing countries (Moghadam, 2003). In East Asia, for example, the industrial progress from the 1980s onwards opened up additional employment opportunities for women, even though most women are wanted in the lowest paying occupations and some cultural and social factors might slow this process or limit its scope. Even there are political and social processes that have some impact upon changing female's situations at teaching and work (Oplatka, 2006). Contemporary women's movements in India, Lebanon, Egypt and Kenya, for instance, have challenged the male-dominated structures in their countries and gender-inequalities. They strived

for the introduction of gender-sensitive policies and programs so as to develop career of women in their countries (Mikell, 1997; Sidani, 2005; Vimala & Kalaimathi, 2012).

In spite of the range of cultural challenges in developing countries, female hold proportion of professional positions in higher education of Latin America (Bain & Cummings, 2000), and have access to managerial positions in many occupational sectors within Africa and Asia countries (Jayaweera, 1997; Malik & Courtney, 2011; Yousefy & Baratali, 2011).

To sum up, economic, social and political processes in many developing countries reflect a potential trend towards greater numbers of women gaining administrative positions in higher education. It is likely to be a logical reason to justify the emergence of study on female in administrative position within developing countries.

Yet, the research on female in administrative positions has drawn almost completely on realities and perspectives taken from western practice and literature, giving a feeling that our existing knowledge of female leadership is a universal pattern. Therefore, studies should extend outside its current near-exclusive grounding in western theories and move toward including more various perspectives from multiple cultural contexts within which administration takes place (Dimmock & Walker, 2005).

Considering the situation of women in administrative positions within developing countries may challenge the methodology and epistemology of existing concepts and theories in the study of female management, as well as offer policy makers with better insight into women leadership particular to developing nations. Because, practice and policy of developed countries agencies that are not well-matched with the contexts of the developing countries (Stromquist & Monkman, 2014).

Understanding the particular challenges to female's access into administrative positions in developing countries may contribute to the improvement of career strategies for career development that are well-matched with the social contexts and organizational of female in developing countries. Exploring the

careers and lives of female administrators in developing countries that “allow” women to be concerned in leadership positions of universities, in addition, inform us a lot about the experiences these female undergo on their way to administrative positions (Aslanargun, 2013).

2. BACKGROUND OF LITERATURE

The study on women in administrative position within developing countries has become a significant field of research since 1980s. There also is a large volume of literature that identifies the challenges and facilitators for women assuming executive and management positions, in society generally and in higher education institutions. Over time, scholars have addressed issues of external and internal influencing factors for women’s development in higher education career structure (Acker, 1989; Shakeshaft, 1989; Walsh, 1996; Blackmore, 1999; Young, 2002; Luke et al., 2003; Oplatka, 2006; Dominici et al., 2009; Lam, 2009; Wajcman, 2013; Li, 2014; Lie & Malik, 2014). An additional category of questions, during the 1990s onwards, emerging mainly referred to the careers and lives of administrative women, especially in developing countries (Walsh, 1996; Aslanargun, 2013; Stromquist & Monkman, 2014).

A variety of studies have suggested diverse explanations to description for the low representation of women in leadership status in higher education of developing countries. Cultural scripts among these are recognize feminine attributes as contributing to unsuccessful leadership (Al-Khalifa & Migniuolo, 1990; Blackmore & Sachs, 2012; Hall, 2013) Blackmore, 1999; Curry, 2000), latent discrimination (Coleman, 2003), and male dominance in administrative positions, which, in turn, hinders the leadership opportunities of many women (Hill & Ragland, 1995; Kabasakal et al., 2011). For example, male dominance of key leadership positions is likely to lead to recruiting new administrators who resemble their sponsors

in attitude, philosophy, deed and appearance, hobbies, club membership, i.e. men (Hill and Ragland, 1995). Women's under-representation in leadership positions may be attributed also to women's own decision not to apply for promotion in higher education for a variety of reasons, such as lack of necessary aspirations, lack of awareness of the promotion system and a lack of confidence that they will succeed, gender-based socialization, fear of failure, and lack of competitiveness(Martin, 2008;Baker, 2012).

3. METHODOLOGY

The data presented here are based on review of related studies published in journals. The focus of this paper is on the career development challenges faced by female administrators in higher education of developing countries .The papers have been reviewed and constricted chronologically as far back as 1995 until 2014. The literature included in this review comprises feature length articles concerning female leadership in higher education in developing countries published in major journals(Fitz, 1999; Heck & Hallinger, 2005; Oplatka, 2006; Yang, 2008;Ullah & Skelton, 2013).

The papers gathered for this review are analyzed through the following steps: major findings concerning the context and features of the female leadership in each source are documented and coded. Then, the themes are compared and contrasted in order to identify common and different findings to create a "story" of the female in administrative position of higher education in developing countries in recent years.

4. FINDINGS

This review paper focus on challenges encountering the participation of women in higher education administrative status in

developing countries. Five major obstacles to women's progress to administrative positions in higher education have emerged from the studies done by researchers in different developing countries: Some of the barriers are well-known to researchers in developed countries: women's low self-confidence; gender discrimination, or job-family conflicts. Others, however, seem to be particularly to female in developing countries: cultural and social values background, low women' participation in career structure, and majority of men in teaching position.

4.1 GENDERED CULTURED AND SOCIAL STRUCTURE:

A major obstacle to female's access to administrative positions in higher education refers to the cultural and social structure that divaricates the society into men and women arenas. Deep-rooted norms inscribed in the culture of many developing countries (such as, Turkey, China, Islamic countries) attribute certain spheres and duties of responsibility to each sex, assuming that one must behave in accordance with the social expectations of one's gender (Celikten, 2011; Reishus, 2012; Sidani & Al Hakim, 2012; Rezai-Rashti, 2013). In this sense, management positions are belonging to male members of the society and women should avoid doing from any attempting to attain this type of status. Otherwise they are at risk of diverse social sanctions, such as reduced opportunity to get married (Cubillo & Brown, 2003; Ely et al., 2011).

For instance, in the traditional Chinese culture, women have been in the submissive roles both in society and at home (Yang, 2008). Women are less strong than men and therefore cannot hold managerial positions is common in many developing countries is based the social and cultural assumption (Calvert & Calvert, 2001). In Nepalese culture, women are in various cases still chained to the house, which is seen as the space where they may obtain spiritual and ritual purity. If a woman obtains this purity, which many still believe to a significant degree can only be achieved in

the home, through domestic activities, then, she can evolve to the next spiritual plane, that is, can be reborn as a man. The barriers to career advancement experienced by women in developing countries seem to be determined by specific religious beliefs, cultural and values that identify femininity in terms of child-raising, marriage, and housekeeping (Schulz, 1998).

Low women's participation in higher education and career structure of higher education in many developing countries makes it less reasonable for many women to be able to obtain the competencies, skills and training necessary for professional and administrative positions in higher education. In Africa, clearly is maintained that women's career development is impeded due to discrimination experienced in society against girls' education(Chabaya et al, 2009) .

4.2 GENDER DISCRIMINATION:

Researchers conducted in developing countries expose a wide-ranging of discriminative behaviors towards women in administrative position of higher education system. Men are preferred by authorities to hold administrative positions in Papua New Guinea(Potek, 2009) , Pakistan(Malik & Courtney, 2011),Uganda (Sperandio & Kagoda, 2008), Turkey (Celikten, 2011), Iran(Shahtalebi et al., 2011),China (Yang, 2008), and many other developing countries. female and male with the equal educational qualifications and same experiences reach different occupational position; the men having easier access to official sector employment, managerial and technological careers or entrepreneurship(Jayaweera, 1997;Oplatka, 2006). Stereotypes 'think manager–think male' attitude is an entrenched view, especially among males (Schein, 2001).

One critical reason for this discrimination relates to many men's tendency to hire people who feel, look, think and act similar to them(Özkanlı & White, 2008;Wajcman, 2013).in addition, men are interested in holding onto authority and power rather than

distribute it with women. Women in Nepal, although, are aware of female dehumanization on the path to development (Schulz, 1998).

4.3 MAJORITY OF MEN IN THE TEACHING POSITION:

When the majority of faculty members in developing countries are male, it is hardly surprising that there is a small number of women in leadership positions in higher education. To illustrate this situation, statistical data from various developing countries indicate that of the more than 82% are male in Pakistan, and in middle east ,faculty members women are only 20 %, and in the 14 poorer countries, there were more male faculty than female faculty, in 2010, in Iran the figure was 25 % of women held teaching positions in tertiary education, in other parts of the developing world, the trend remains the same; college and university teaching is a male-dominated arena (Lie & Malik, 2014).

4.4 LOW SELF – ESTEEM AND CONFIDENCE:

Some studies argued that women's low confidence and self-esteem with respect to their management capabilities are likely to stunt women's career advancement in administrative positions(Oplatka, 2006;Karadag & Bektas, 2014).Studies in non-Western universities found that the barriers for career development of female sometimes lay within the women themselves (Adair, 1999; Cubillo and Brown, 2003; Lam, 2009). Some women refuse to attempt their way to reach the top position because of their lack of self-confidence(Nguyen, 2013). Hoeritz(2013)found that gender stereotyping has a profound impact on women's behavior and attitude. In other words, women have long been the sufferers of the socially and culturally generated values that describe them as weak and subordinate on men. As a result, In Turkey, many women do not aspire to leadership positions because they believe themselves incapable. Women are worried that they cannot resolve problems

or continue effective and creative work relationships with their male superiors or subordinates (Karadag & Bektas, 2014).

Cultural stereotypes of women as less able and less proficient than men to administer challenges are probably to make women consider they cannot be risk-takers (Lam, 2009; Nguyen, 2013). Even women who are achievement-oriented can undergo from such stereotypical portrayals (Madsen, 2008). For instance, Pakistan women who have been socialized to adopt family roles were indicated to have low self-esteem and low self-confidence in their abilities outside the household role (Ullah & Skelton, 2013). Similarly, research conducted in Turkey showed that women do not submit an application to be administrator, even when they are as well proficient as the male applicants, at least in part, because they have negative self-perceptions and lack self-confidence in their experience and qualifications (Karadag & Bektas, 2014). Jayaweera's (1997) work was insightful in illuminating this aspect in Asian countries. He showed that gender role stereotypes in educational materials, in the curriculum and in the school environment transmit gendered attitudes towards the roles of girls and boys and engender negative self-perceptions in girls that could impede their personal development.

4.5 FAMILY RESPONSIBILITY:

For some writers, the major barrier to women's career development refers to the family responsibilities that the majority of women in developing countries are forced hold ((Luke et al., 1997; Olsner, 1997; Oplatka, 2006; Lam, 2009; Celikten, 2011). In traditional society, women are expected to be in charge for their families, including remaining close to their children, the wife, and the extended family. In this sense, Turkish women do not desire administrative positions that mean long working hours and difficult conditions, while their wives' resistance obviated any career promotion (Celikten, 2011).

The pressure of family household tasks results in women continuing to be the ones who break off their careers, take more

days off work, and work part-time. As a effect, they have less years of job experience, and less hours of employment per year, which slow their career promotion and progress (Eagly and Carli, 2007)

5. DISCUSSION AND IMPLICATIONS FOR FUTURE RESEARCH

This article has documented the common barriers that emerged from the research on women in administrative position in developing countries. The research to date has been concerned with documenting barriers to women's career development in higher education. But, while there are comprehensive research on women administrators in developed countries, the research on women administrators in developing countries is highly restricted to only a few areas.

While the current article pointed to five unique barriers to women's career development in higher education of developing countries, there are probably other barriers and obstacles that women in developing countries might face, with which are not yet familiar.

The study of these barriers needs to be conducted within higher education systems in developing countries in their contexts and as a whole, otherwise, as Grant(2000) maintained, we are in danger of misunderstanding how educational systems work. Thus subsequent study on barriers to women's career development desires to focus both on barriers in the slightest economically developed countries and on developing countries that have been experiencing fast modernization in recent years. It is likely that different barriers exist in each group of countries.

To explore the lived experiences and leadership of women administrators in cultures that are different from those of developed nations, it is suggested to underline the researches on a wide variety of perspectives like: post-structuralism, post-feminism, post-modernism, or standpoint theory. This view may

shed light on many issues of female whose careers and life experiences are dissimilar from those of many women in the developed world.(Tubin 2004).

Obviously, there is limited knowledge of how women leaders in developing countries are similar to or different from female administrators in developed countries, or from their counterparts in other developing countries. Therefore, we need more comparative research studies that investigate the contexts, processes, leadership and work experiences and attitudes of women administrators in the developing countries, with particular reference to dissimilarities and similarities among countries that experience modernization (e.g. South East Asia), and the poorest nations (South Asia).

Further researches on women in administrative status within developing countries must be aimed at generating a worldwide database that would assist policy-makers to recognize the “best” way to develop women in higher education institutions. Only when policy-makers have sufficient and deep knowledge about women leaders in developing countries, they will be able to develop as universal a model of female leadership as possible for theoretical background that is underpinned by multi-national insights and investigations. Our current information in this respect are unlikely to give us with satisfactory practical knowledge to develop programs for developing careers for women in higher education that are based on practical knowledge that has been gathered in the particular situation of developing countries. Therefore, the reader is invocated to seek at this review as a starting stage in the coming out of a new study agenda.

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WOMEN AS TRANSFORMATIONAL LEADERS: A CASE STUDY IN SABAH

Thomas Jalin & Lokman Mohd Tahir

ABSTRACT

The study was conducted by researcher to identify women in leadership practices of teachers and principals from selected schools in Sabah. The study is based on the theory of transformational leadership by Kouzes and Posner (2003). The four components of transformational leadership are studied by researcher that the job performance, job satisfaction, job commitment, and job effectiveness. A total of 500 respondents from the five (5) Government Department and five (5) NGOs Non-governmental organizations involved the study in Sabah. The instrument used was a questionnaire and raw data collected were analysed using the software “Statistical Package of Social Science” (SPSS), version for windows 16.0. For each test, a prior significant level was set at $p < .05$. Analysis generated descriptive statistics of frequency, percentage, mean and variance of uses in qualitative and quantitative methods.

1.1 INTRODUCTION

Women leaders have a very significant role in determining the level of excellence or success of an organization while she leads. Women leaders will determine the future direction of the organization. The main challenge faced by women leaders is how

to plan, develop, and accomplished for change making better leaders within organization. The important of transformational leader is able to influence followers awareness and at the same time support of change to individual personal priority for the government department and NGOs non-governmental organizations. For example, the success of women leaders in school is all on the responsibilities of women principals, assistant principals and all qualified teachers who have practice to be an effective as educators and leaders. Remember, the theory of leadership, “the Kouzes & Posner” was saying, if you don’t believe in the messenger, you won’t believe the message. You can’t believe in the messenger if you don’t know what the messenger believes (Kouzes and Posner 2003). In other words, the leader focuses on, while managers are concerned about the way. Thus, the capacity and capability to face and deal with these situations requires a variety of alternatives. According to Abdullah (2003), submitted by his leadership in which his theory has been supported by the experts say it's a leader's transformational leadership style adopted when he was able to change the attitude of the individuals who lead from the attitude to prioritize the important of self-conscious group. These changes occur when they are voluntarily willing to work and strive to achieve the goals and objectives of the organization. In the context of the school, teacher or principal is an important and influential individual as well as having a major role in creating a learning environment, professionalism, communication between the staff and the level of their concern for climate change is happening in the school and the learning environmental is organized in every school.

1.2 STATEMENT OF PROBLEMS

Women leadership like those teachers and principals are needed in the administration of the school. They are not only responsible for the management of the school and even to teachers and students as well responsible to the society effectiveness of a

school is dependent on the level and style of leadership or teacher practice. Leadership style would be emphasized together with transformational leadership. Transformational leadership by teachers and principals can encourage teachers to change their attitudes and values in order to have a commitment to the mission and vision towards the important of education. This section to determine, to describe and identify the attributes of effective characteristics of five (5) government agencies and selected colleges through the eyes and responses of the school principals and assistant principals; and teachers. There are five (5) NGOs Non-governmental organization in responses to women organizations in Sabah. The key points to includes further for example, to identify the issues that are the basis of the study; specify the various aspects of perspectives on these issues; raise some of the main research questions that you want to answer through your study; identify what knowledge is available concerning your questions, specifying the differences of opinion in the literature regarding these questions if difference exists; and develop a rationale for our study with particular references to how your study will fill the identified gaps.

1.3 RESEARCH OBJECTIVES

1.3.1 To identify level of the four components of transformational leadership in job performance, job satisfaction, job commitment and job effectiveness towards the inspirational motivation for women leaders, teachers and principals at selected schools in Sabah.

1.3.2 To determine the leadership strategies that selected frequently used by women leaders in government department and NGOs Non-governmental organization based on Kouzes and Posners transformational leadership model.

1.4 RESEARCH QUESTIONS

1.4.1 What are the leadership strategies that being needed amongst women leaders to be selected in government department and NGOs non-governmental organizations on Kouzes and Posner transformational leadership model?

1.4.2 What is the leadership strategies needed to women leaders to accomplish organizations as refer to the job performance, job satisfaction, job commitment and job effectiveness?

1.4.2.1 The perception of employees towards women as transformational is how leader plan, develop, and accomplish significant change in a organizations by being attentive to needs and motives of their followers (Northouse, 2004). The women strategies referring to Model's Kouzes and Posners would apply to the ten commitments of leadership are your voice must be heard in order to clarify our personal values. The strategies of women leadership to approach for government department and NGOs Non-governmental organizations need to be improved.

1.4.2.2 The four key words to study women transformational as future leader, the Job performance focused on knowledge, tasks and interpersonal skill in organizational behaviours, the Job satisfaction which a person feeling an individual to her organization, the Job commitment is individual goal and values for her organization, and the Job effectiveness for individual characteristic to individually which identified as effective women leader. The skills and knowledge is able to develop, to train and to coach subordinates.

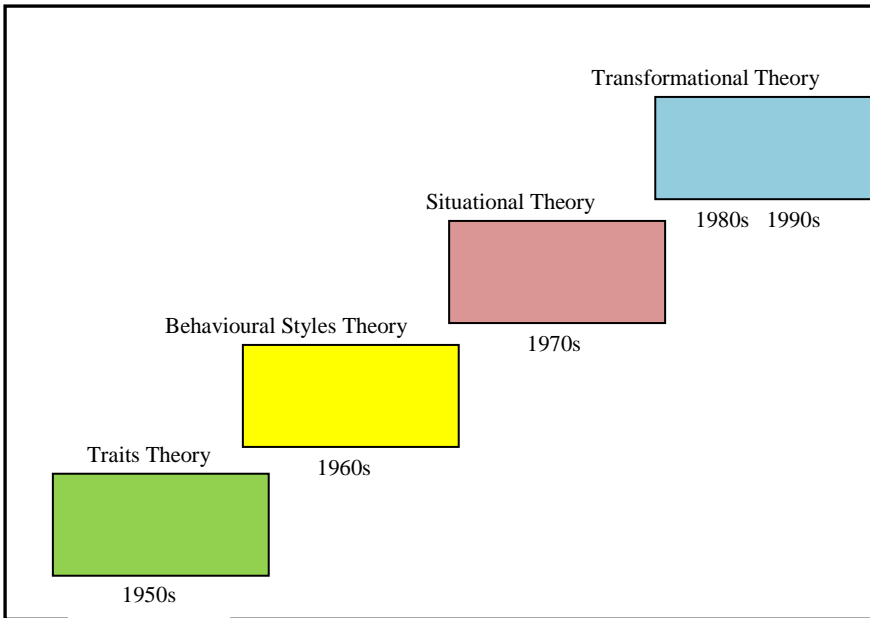
1.5 SIGNIFICANT RESEARCH

Why the significant research important? Significant research most important because research are more likely found out when people perceive their immediate status leadership, as a school principal and as a leader of organization to have high credibility, they are significantly more like to be proud to tell

others they are part women leaders of the organization. They feel a strong own personal value as consistent with part of the organization. Of course, they feel attached and committed to the organization, and have a sense of ownership of the organization. This study was conducted to determine the extent of the practice of transformational leadership in a number of schools and government agencies in Sabah. The results of the study and the information obtained is necessary to reference the relevant parties involved, directly or indirectly, as a great teacher, school principals, teachers, assistant principals, heads of organizations such as the head of the committee or the fields and organizations, teachers and so on. Today, women would no more depending from men; they would claim to make with equality compare to men. The National Educational Blueprint marked the significant of women in realizing the role of school women principal is considered as the first and foremost important person in ensuring the effectiveness of the school and efficiency in running the school (Rahimah 2004).

1.5.1 THEORIES OF LEADERSHIP

Researcher has summarized the evolution of leadership theories into five major approaches to leadership. Examples, the traits theory, behaviors theory, situational theory and transformational theory. These theories of leadership have been studied and discussed from the scholars and researchers because it's the key factor in the success or failure of most organizations, Kouzes and Posner (2003).



1.5.2 RESEARCH DESIGN

Research designs are to describe and to find out the response of employees towards women leaders as transformational leadership a case study in Sabah. According to research design suggested by Creswell (2003) there are five important method designs sequential design, explanatory design, embedded design, triangulation design and concurrent design. The study of research design is suitable for use in research that aims to describe an event or situation is going to take the data, phenomena studied are transformational leadership practices of the few schools in Sabah. All formulations of the objectives of the study are based on the responses given by the response to all statements contained in the questionnaire form. According to Creswell (2003), the literature support the premise that qualitative a research methodologies are the most appropriate way to explore on women's issues and concerns as leaders. The two variables that will be used in this study, that is the dependent variables and independent variables.

Variables that will be used in this study is the level of transformational leadership practices, while the independent variables were demographic factors namely- gender, race, and the term of office as a teacher or principal to serve as respondents.

1.5.3 POPULATION AND SAMPLE

This quantitative research was developed from relevant perspective whereby the researcher designed a research study to administer a survey on a sample of population to examine the relationships to the government department leaders and non-governmental organizations as transformational effectiveness to relates the theory of Kouzes and Posners, (2000) to the (5) five Models:- Challenging the process, Inspiring a shared vision, Enabling others to act, Modelling the way and Encouraging the heart, as perceived by the subordinates and subordinates decision making, personal character, usage of power, and communication skills as served in the government departmental heads and non-organizational organizations.

1.5.3.1 Researchers aimed to investigate the practice of transformational leadership headmaster at the selected schools in Sabah. In this sample, the researchers will select teachers and principals from selected schools in Sabah. There are 500 respondents in the sample, and will relate the level of teacher and principals leadership through the questionnaires will be distributed. Researcher's used 500 female as respondents in this study. The five (5) are government department of 250 respondents and another five (5) NGOs Non-governmental organizations of 250 respondents of women leader selected from KYS Sabah College Foundation, SMK Sabah College, TTC Gaya Teachers Training Institute, KPM Ministry of Community Development and Consumer Affairs and Sabah Tourism and NGOs organizations from UMNO Women Movement, PUTERI Sabah Women Youth, UPKO Women Movement, PBS Women Movement and MPWS Sabah Women Advisory Council.

PURPOSIVE SAMPLING VS CONVENIENT SAMPLING

Purposive Sampling	Convenient Sampling
Non-probability sampling Qualitative research Sample of population/organization Involves the sample	Non-probability sampling technique Quantitative research Accessibility and proximity Available and convenient

PURPOSIVE & CONVENIENT SAMPLING

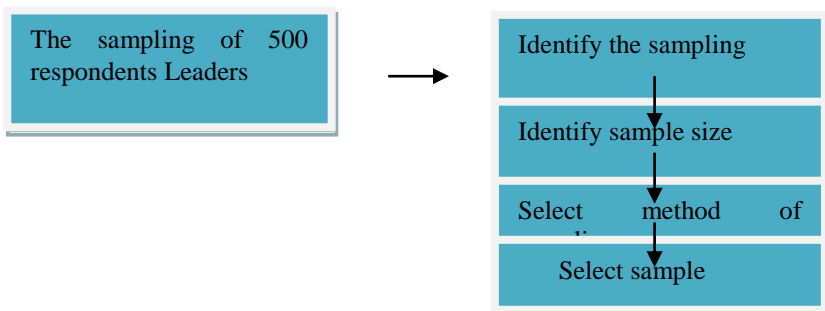
GOVERNMENT	(NGO) NON-GOVERNMENTAL/O
Sabah Tourism - 50 respondents (Men/women)	MPWS - 50 respondents
S.M Sabah College - 50 respondents (Women Principal)	UMNO Sabah Women - 50
KYS - 50 respondents	Puteri Sabah Women - 50
IPG - 50 respondents (Men/women)	UPKO- Sabah Women - 50
KPM - 50 respondents	PBS-Sabah Women - 50

250 respo ndent s	250 respondents
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1.5.3.2 Researcher's used 500 female and male as respondents in this study. The five (5) government department of 250 female and male as respondents and Five (5) NGOs non-governmental organizations of 250 female and male as respondents of gender leaders (see Table 3:4.3) at the time of study. This study was designed to include as many academic staff, civil service and women leaders in the hope that findings of this study could be generalized to the whole of women organizations.

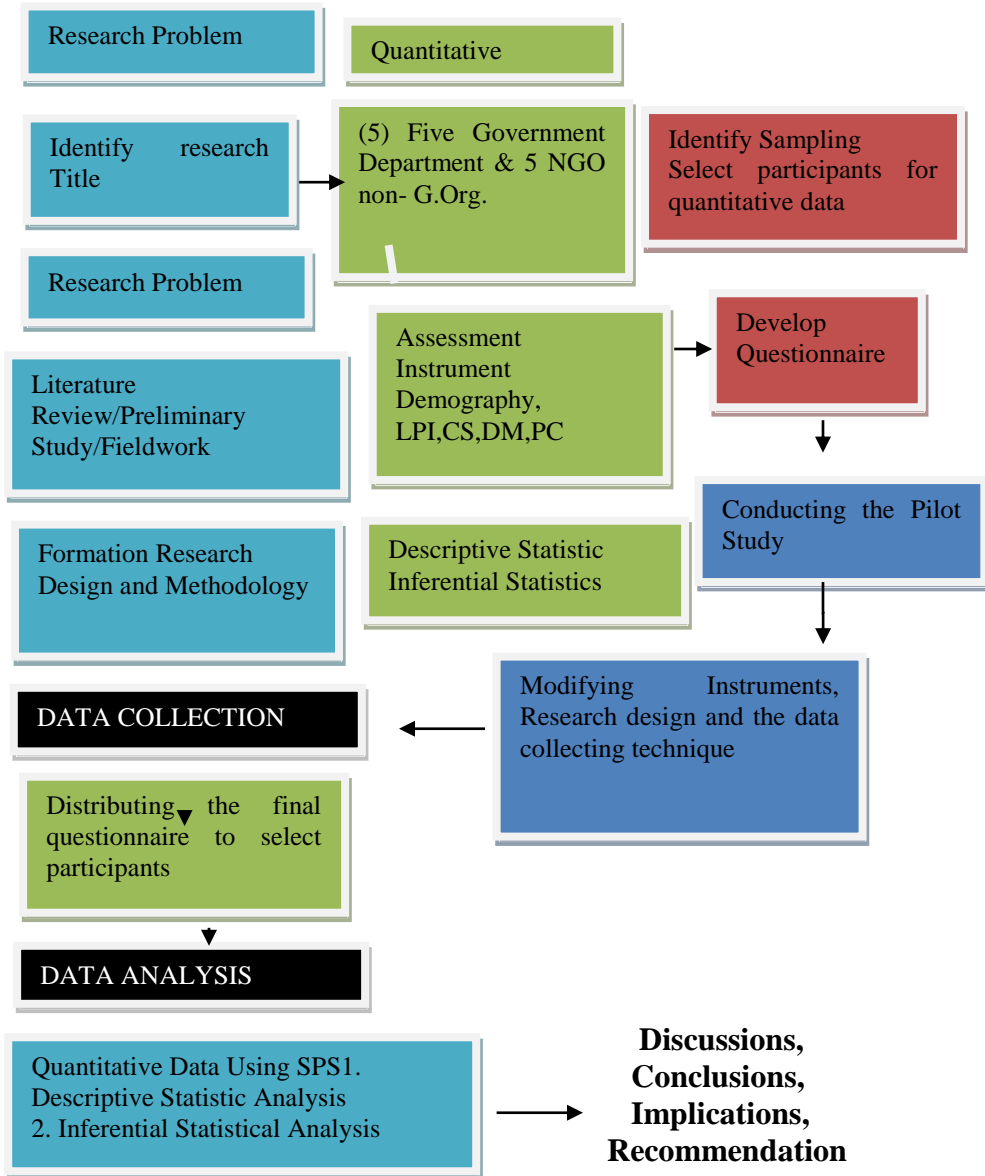
1.5.3.3 The questionnaire survey held in Sabah. The selected (5) agencies at government department. The following government department in educational organizations which started from (KYS) Sabah College Foundation, Sabah College, (TTC) Gaya Teachers Training College, (KPM) Ministry of Community Development and Consumer Affairs and Sabah Tourism. The selected (5) NGO non-governmental organizations are most useful women in Sabah. They are UMNO Women's movement, PUTERI Sabah Women's Youth, UPKO Women's movement, PBS Women's movement and MPWS Sabah Women's Advisory Council.

1.5.4 SAMPLING METHOD



1.5.5 RESEARCH POCEDURE

The women organization and sampling begins when the researcher formulate the research problem and review the literature through which women is described conceptually. To identified and analysed of women leadership in organization. It is often impractical and usually unnecessary to measure all the elements in women of interest. Typically a relatively small number of subjects that will adequately represent the population are selected from number of women. The degree of representativeness and the quality of the information obtained is based on the sampling technique. The research procedure for selecting such a sample is to use probability sampling, a method of sampling in which the subjects are selected randomly in such way that the researcher knows the probability of selecting each number of women. Random selection implies that each member of women as a whole or of subgroups of the organization has an equal chance of being selected. However, there is always some degree of error in sampling and that error must be considered in interpreting the result. The strategy for selecting sample influences the quality of the data and the inferences that can make from it. In this research, the population is categorized as a large population and it is quite impossible and need time to use all women leader.



1.5.6 SURVEY QUESTIONNAIRE

The survey questionnaire is a tool used in the study to test a question. It is based on questionnaire because it coincided with the methodology of the study as well as saving time and cost of research. The study employed Kouzes and Posner's LPI Leadership Practices Inventory (2003), questionnaires were used to measure concepts related to the attitudes, perceptions and views of the evidence than the background. Data were collected via survey questionnaire. The use of questionnaires can improve the accuracy and truthfulness of the responses given by the sample as it is not affected by the maneuverability of researchers. The questionnaire is also an instrument that is often used in descriptive research method, the collaboration of the respondents in research survey. They are free to make choices and assess according to the questionnaire. Researchers found the selection questionnaires as the instrument is based on several reasons, namely; Obtain more accurate data, and respondents can provide quicker feedback on what you want to review, compared with other methods. Researchers can communicate or cooperate with their responses more easily.

1.5.7 PILOT STUDY

The objective for conducting pilot study was to test the internal reliability and validity of the instrument in measuring the variables of the study. A total of 30 respondents were involves in this pilot study. The selected respondents were the principals, assistant principals and teachers) of education department, and civil servants of government department which is involves in this pilot study.

1.5.7.1 The pilot study also aimed to assess the procedures of the study in ensuring and efficient and accurate execution during actual study. The reliability of the instruments were estimated from the data collected by calculating Cronbach's alpha used to test all

the independent variable (communication skill, decision making skills, power of usage, and personal character) and dependent variable (leadership effectiveness). From the pilot test, it was found that all the instruments appeared to be stable and met the standards of the internal reliability and validity of the instrument. The high coefficient values obtained reflect the scales were essentially dependable. From the pilot test, some minor necessary editorial changes were made. In this study reliability test was done to test the reliability of items both independent and dependent variable through pilot test. The reliability coefficients of all the measures obtain in the pilot test study.

RELIABILITY TEST RESULTS

Variables	Alpha Value
(a) Leadership effectiveness	
(b) Communication skills	
(c) Usage of power	
(d) Decision making skills	
(e) Personal character	

CONCLUSION

This concept paper contained the important key points of women leadership. It provides the explanation to women as transformational leaders, the needs of women being addressed by changes of women transformational leadership development. Researcher provides a review of the literature available about women leaders. It provides theory and model and including the definition of women leadership of government department and NGOs non-governmental organizations. It provides an analysis of the literature to define the women leadership; and development theories taught in public sectors and private sectors.

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Developing a 3D immersive environment for Activities of Daily Living (ADL) user interface and modeling based on hand stroke patients' needs analysis

Siti Rohani Binti Isnin, Dayang Tiawa & Shahrizal Bin Sunar

ABSTRACT

This paper basically introduces the development of 3D model as user interface which intends to improvise the hand stroke rehabilitation system. The study begins with an investigation of the problems faced by hand stroke patients during their conventional therapy sessions. A population of hand stroke patients and their therapists were the subjects of this study. The results of the investigation later will become the basis of the development of 3D Cybertherapy System (3D CTS). This new developed system is aimed to improve the functioning recovery hand stroke patients by stimulating their cognitive and motor based on Fitts & Postner (1967) theory. The system is believed to help in developing the cognitive and hand rehabilitation aspects of hand stroke patients. The environments of the system involves with activities of daily living (ADL) like hobbies and daily life routines. Those environments developed by using Autodesk 3D MAYA software, Adobe Photoshop, Sound Forge and supported by wireless 5DT data glove.

Keywords: 3D model, Virtual Reality Technology, Hand stroke rehabilitation

1.1 INTRODUCTION

By definition, stroke is the lost of half of the body capacity (hemiplegia) or fully paralyzed which has a great potential to experience cognitive impairment since it is highly dependent on the brain damage that normally involves during the sudden stroke attack (Gourlay, K.C.Lun et al., 2000). The patients can be temporary or to be worse permanently paralyzed throughout their lifetime if the disease has not been treated immediately (Page SJ, Levin P et al., 2001). One of the essential paralysis of the body are the hands. (Park et al., 2011; Connelly et al., 2010)

As concerned, hand plays an important role in implementing the daily activities of human life, which is used to hold hands, pinching, grasping, throwing, and many other activities. Therefore, without the ability to function well with hand can seriously affect the psychology aspects of the patient in a negative manner. Due to this fact, there is a desperate need of the teaching methods and effective rehabilitation tool to relearn skills that are lost due to stroke among the patients.

Many studies conducted previously have found that the use of computers with the combination of high tech equipment will help to educate stroke patients to go through hand rehabilitation effectively and efficiently (Noguchi, Asavaritikrai et al., 2007). In the study, virtual reality technology is used as a simulation in which its criteria: interactivity, repetitive, fun, engaging and functional diversity are likely to provide significant contribution to the learning situation for stroke patients at different levels of severity (Duncan, 1994).

1.2 The investigation of the stroke patients' needs

A survey is done to investigate the problems occurred among stroke patients in the hospital in southern region in Malaysia by using conventional hand rehabilitation therapy. This survey is done by interviewing the stroke patients and also their therapists. This

method is considered as the needs analysis which is responsible in shaping the development of a new system which addresses in improving the stroke patients' cognitive aspect and also the hands rehabilitation.

Both patients and therapists are believed to be the core voices in investigating the specific needs since they are the focal actors in the hand rehabilitation session and this fact allows them to provide the best answer. Later, the stroke patients are required to use the wireless 5DT cyberglove in order to perform tasks designed by the system. The glove applies the concept of visibility as it becomes the mapping between the determined tasks and actual actions (Jung, Yeh et al., 2006).

The system offers feedbacks to respond appropriately to the patients' actions in which make it appears to be real and interactive. The result of every access that the patients made will be recorded in a database. This situation will help the patients to monitor their progress and this will definitely help to motivate them to keep on using the system in order to improve themselves and their confident will be greatly increased.

1.3 The development of the system: The grasping task

For the purpose of this study, the grasping task is designed particularly for stroke patients who suffer from "motion deficits in the upper extremity" (pg. 932) as stated in Jung, Yeh et al. (2006). From the need analysis, the interface of the reaching task is carefully designed as to meet their special needs. Basically, this system demands the users to grasp and pick an object as shown in the figure 1:



Figure 1 3D Cybertherapy system

This 3D Cyber therapy system (3D CTS) will act as virtual tutors or educators for the stroke patients to be able to interact with them and have a real-life feel which triggers meaningfulness of learning and develop favorable outcomes. The illustration of the system welcoming the users in a friendly and unthreatened manner can be seen in the figure 2:



Figure 2 : Welcoming page

Within the 3D spatial space, the users are required to reach particular virtual objects in order to provide rooms for them to use their hands excessively. The tasks in general are the simple daily life activity which is illustrated in the figure 3 and figure 4.



Figure 3 : grasp a glass



Figure 4 : Kitchen environment

After they go through the excessive practice of simple reaching tasks like in the previous picture, the patients will be presented with more difficult tasks; however, the tasks are still within the real-life contexts. Basically, the tasks are developed based on the hobbies or life tasks which require lots of hands movement in reaching specific objects. For example, pull out weeds in the house yard as demonstrated in the figure 5 :



Figure 5 : House yard

1.4 Measuring The Developed System Effectiveness

In evaluating the system effectiveness, the method used is the tracking data method in which it involves with an experiment. This kind of evaluation deals with the data generated in the computer whenever the patients access to the system. The time history will tell that within that particular time duration, how much the patients have improved in cognitive and hand rehabilitation aspects. Observations are done for both tests as to support the data from the computer system. The researcher's field notes will be used as evidences in backing the findings from the tracking data.

1.5 The Study

The system developed above has been tested on a patient during a twelve week study using a single subject experimental method. A total of 3 adult participants with a specific inclusion volunteered to take part in this session. The Occupational Therapist (OT) in one of the outpatient rehabilitation Unit was recommended the participant involved in this study. We explained to all participants the experiment schedule and answer their questions and then request their informed consent to the experiment. They are volunteering to participate after giving a brief information about the system while attending their rehabilitation session. The inclusion for the participant was:

- i. Right cerebrovascular-accident (Right CVA)
- ii. Experience after 6 month stroke.
- iii. Participants had no severe cognitive limitations

Table 1 : Characteristics of participants

Participant	Age (year)	Gender	Time post stroke	Dominant hand
PT1	61	M	1 year	Right
PT2	69	F	3 year	Right
PT3	70	F	8 month	Right

The participants were trained three times a week in a six week period. They practiced for about an hour session. Each user done and calibrated the dataglove and was instructed in the hand rehabilitation movement, and given up to 5 minutes to practice and become accustomed to working in the virtual environment. The therapist assisted the participant in wearing the dataglove completely. After done, the therapist explained the cybertherapy system task and they are guided through a series of the exercises. For the study, improvement in the finger range of motion during the training procedure was observed individually. The participants are required to give an opinion about the cybertherapy system after they completed the task in order to make improvements in the system.

1.5 Result

For this session only three samples have completed the experiment (experiment with the other patients will be continued until all the identified patients are done). Below is the result obtained after three stroke patients undergone treatment for 12 weeks. Figure 3 and 4 shows the percentage of change in the patients' finger performance over the six week intervention. All the three subjects show improvement measures as recorded by the therapist. The substantial improvement is in range of motion of the thumb and fingers.

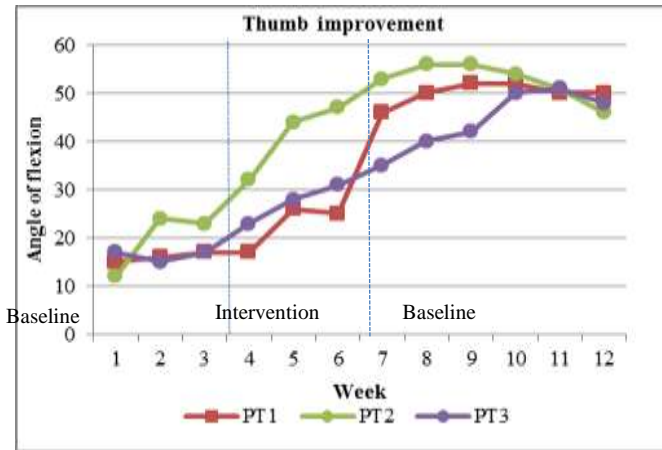


Figure 7 : Thumb performance

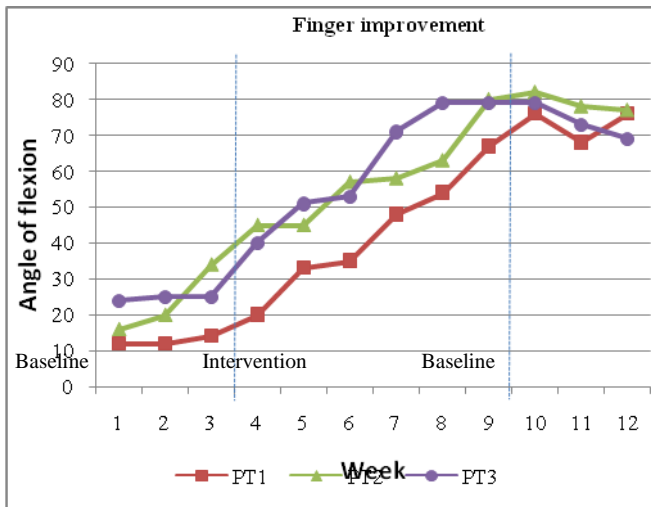


Figure 8 : 4 Finger performance

All the participants show improvement throughout the

treatment session. There are significant differences in the angle of thumb flexion where the maximum value of flexion for PT1 is (55%), PT2 (65%) and PT3 (49%) increased when compared with their initial condition. Follow up session took place after the treatment session was done. The figure shows that there was still an enhancement by weekly treatment and participant still has energy left after treatment is done. In figure 4, PT1 displays raise in finger's flexion until follow up session. The increasement for PT1 is about (73%), PT 2 (67%) and PT 3 (52%).

Although participants involved are older people age 60 and over, their motivation in accomplishing the task objective with 3D Cybertherapy system was very high. In response to our question regarding the learning environment, most of the participants gave encouraging words. PT1 said that the system is very useful and user friendly (easy to access). The most exciting when they can see the virtual hand move synchronously with the data glove.

1.6 Conclusion

This study demonstrated that we have been able to develop a complete 3D cybertherapy system, which incorporate an input device to accommodate patients with different level of hand impairment and based on handstroke needs. Overall, the responses to our system were positive. Cybertherapy technology was found to have potential as an assessment and training device in stroke rehabilitation. It has been shown that the use of cybertherapy in rehabilitation affords the opportunity for individuals to practice movements in several different environments and provides unlimited options for object size, type, and location. It also has the capability of creating an interactive, motivating environment in which practice intensity and feedback can be manipulated to create individualized treatments (Conelly et al, 2010). Moreover, by using computer assisted rehabilitation, it can be easier to implement specific rehabilitation exercises, increase intensity,

repetitive, and skill based . The system would help meet the needs of the rising number of stroke patients with impaired hand function.

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KEKANGAN PELAJAR DALAM MENGIKUTI KURSUS PENGHASILAN TEKNOLOGI VISUAL DAN PANDANGAN PENGUNAAN APLIKASI MOBIL

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ABSTRAK

Kajian awal ini dijalankan untuk mengenal pasti masalah yang dihadapi oleh pelajar dalam kursus Penghasilan Teknologi Visual. Selain itu, kajian ini harus dijalankan untuk mengenal pasti pandangan pelajar terhadap penggunaan aplikasi mudah alih dalam kursus Penghasilan Teknologi Visual. Seramai 10 orang responden yang telah mengikuti kursus Penghasilan Teknologi Visual terlibat dalam soal selidik dan sesi temu bual.

Kata Kunci: Kekangan dalam fotografi, Pembelajaran Mobil

PENGENALAN

Perkembangan teknologi maklumat dan komunikasi memberi impak positif dalam kehidupan manusia. Semenjak Internet dibangunkan, semua urusan harian dari membeli barang keperluan asas, membayar hutang dan mencari maklumat semua dilakukan atas talian kerana lebih menjimatkan masa, boleh dilakukan di mana-mana dan pada bila-bila masa.

Dari konteks bidang pendidikan, perkembangan teknologi dan Internet telah mewujudkan pelbagai strategi pembelajaran seperti e-pembelajaran, pembelajaran jarak jauh dan pembelajaran berasaskan web. Tidak terkecuali juga dengan perkembangan

peranti mudah alih seperti telefon pintar, *personal digital assistant* (PDA) dan *tablet* di mana pembelajaran mobil menjadi pilihan dalam bidang pendidikan masa kini.

Perkembangan penggunaan Internet dan teknologi berasaskan web yang pesat menggalakkan proses pengajaran dan pembelajaran melalui Internet. Pembelajaran jarak jauh seperti e-pembelajaran membolehkan pelajar dan pendidik berkomunikasi, mengakses bahan pengajaran, menghantar tugas dan membuat perbincangan secara atas talian (Junaidi & Jailani, 2010) tanpa batasan waktu dan tempat. Namun begitu, penggunaan peranti mudah alih dilihat semakin mendapat perhatian dalam bidang pendidikan dan tidak mustahil pembelajaran mobil akan menjadi pilihan berbanding pembelajaran e-pembelajaran dan pembelajaran berasaskan web dalam masa lima tahun (Stanley, 2010)

LATAR BELAKANG MASALAH KAJIAN

Menurut (Embi & Nordin (2013) dan Shih, Chuang, & Hwang (2010). pembelajaran mobil adalah satu pembelajaran melalui telefon bimbit yang berlaku tanpa sempadan tempat dan masa. Manakala Vavoula, Sharples, Rudman, Meek, & Lonsdale (2009) mendefinisikan pembelajaran mobil sebagai aktiviti pembelajaran melalui *personal digital assistant* (PDA), telefon selular dan *tablet* di mana berlaku di dalam atau luar bilik darjah. Menurut Woodill (2011) terdapat enam ciri-ciri pembelajaran mobil iaitu *mobility*, *ubiquity*, *accessibility*, *connectivity*, *individuality* dan *creativity*.

Ciri pertama iaitu *mobility* bermaksud peranti tersebut mudah dibawa ke mana-mana oleh pelajar dan mereka bebas menjalankan pembelajaran tanpa batasan tempat. Manakala ciri kedua iaitu *ubiquity* menerangkan peranti mudah alih mempunyai kadar penembusan maklumat yang tinggi di seluruh dunia. Ia membolehkan pengguna menjalankan pembelajaran tanpa batasan waktu dan tempat melalui peranti mudah alih. Seterusnya ciri ketiga iaitu *accessibility* menunjukkan peranti mudah alih

mempunyai keupayaan mengakses awan maklumat di mana ia menyediakan sesuatu maklumat pada masa itu di Internet. Pelajar boleh mengakses maklumat tersebut untuk mendapatkan maklumat yang dikehendaki dan seterusnya dapat menambah pengetahuan dan kemahiran tentang sesuatu tajuk. Manakala, ciri keempat iaitu *connectivity* bermaksud peranti mudah alih yang disambungkan dengan Internet mempunyai fungsi menghubungkan sesiapa sahaja di seluruh dunia. Pelajar dapat berkomunikasi dengan rakan lain dan menghantar tugas yang diberikan oleh pensyarah.

Selain itu, ciri kelima iaitu *individuality* menunjukkan peranti mudah alih adalah milik individu dan tidak berkongsi dengan orang lain. Hal ini membolehkan pembelajaran dijalankan mengikut keperluan seseorang pelajar. Manakala ciri terakhir iaitu *creativity* bermaksud peranti mudah alih mempunyai fungsi untuk membina dan menyunting sesuatu informasi boleh dijadikan sebagai landasan untuk menghasilkan kandungan. Hal ini memberi peluang kepada pelajar menyampaikan idea, pandangan dan cadangan mereka dalam bentuk maklumat digital melalui aplikasi pemprosesan perkataan dan persembahan multimedia. Tambahan pula, hasil pelajar tersebut boleh digunakan sebagai bahan-bahan untuk pembelajaran mobil.

Menurut Bolorizadeh, Brannen, Gibbs, & Mack (2012), penggunaan telefon bimbit telah berubah dari segi kaedah manusia berkomunikasi, mengakses dan memindahkan maklumat antara penyampai dan penerima. Selain itu., pembelajaran mobil dilihat semakin meluas penggunaannya melebihi persekitaran pendidikan (Ros i Solé, Calic, & Neijmann, 2009). Kajian oleh Sung & Mayer (2012) mendapati peranti mudah alih sebagai alat teknologi untuk menyokong pendidikan lebih digemari oleh pelajar kerana ia boleh di bawa ke mana-mana, mudah mengakses maklumat dan teknologi yang baru untuk pendidikan.

Antara kebaikan pembelajaran mobil ialah pengguna boleh mengakses Internet di mana-mana sahaja dalam kawasan liputan Internet pada bila-bila masa dengan menggunakan telefon bimbit (Chen, 2010) Manakala, kajian oleh Soh (2012) mencatatkan bahawa majoriti pasca siswazah di ipta bersedia (nilai min=4.43)

mengakses maklumat melalui Internet dengan menggunakan peranti mudah alih serta mereka juga memberi persepsi (nilai min=4.44) yang positif mengenai pelaksanaan pembelajaran mobil di ipta

Selain itu, kajian oleh Wang, Shen, Novak, & Pan (2009) menunjukkan bahawa pendekatan pembelajaran mobil mampu mengubah cara berfikir, perasaan dan tindak laku pelajar melalui aktiviti-aktiviti yang dijalankan di dalam kelas. Tambahan pula, kajian lain menunjukkan pelajar yang dahulunya pasif di dalam kelas telah berubah menjadi aktif dan mahu terlibat sama dalam proses pembelajaran hasil daripada pendekatan pembelajaran mobil (Embi & Nordin, 2013)

Penggunaan pembelajaran mobil dilihat memberi kesan positif dalam bidang pendidikan. Oleh itu satu kajian telah dijalankan untuk mengetahui kesesuaian pelaksanaan pembelajaran dalam kursus fotografi di institusi pendidikan tinggi. Kajian ini dijalankan dengan objektif mengenal pasti masalah yang dihadapi oleh pelajar dalam kursus Penghasilan Teknologi Visual. Selain itu, kajian ini dijalankan untuk mengenal pasti pandangan pelajar terhadap penggunaan aplikasi mudah alih dalam kursus Penghasilan Teknologi Visual.

METODOLOGI KAJIAN

Pengkaji telah menyediakan dua set instrumen kajian iaitu borang soal selidik dan temu bual. Soal selidik telah diedarkan kepada sepuluh orang responden yang mengikuti kursus Penghasilan Teknologi Visual dan kesemua responden telah ditemu bual bagi mengukuhkan dapatan daripada soal selidik.

Soal selidik digunakan bertujuan untuk mengetahui cara penyampaian, masalah yang dihadapi dan cadangan dalam kalangan pelajar kursus Penghasilan Teknologi Visual. Soal selidik ini mengandungi 3 bahagian iaitu Bahagian A berkaitan demografi responden. Manakala, Bahagian B mempunyai lima soalan terbuka berkaitan penyampaian maklumat yang digunakan dalam kelas

oleh pensyarah dan pelajar. Bahagian C mempunyai empatsoalan terbuka mengenai pandangan dan cadangan pendekatan pembelajaran mobil di dalam kursus tersebut dan satu soalan berbentuk pilihan tajuk yang sesuai untuk dibangunkan dalam aplikasi mobil.

Pengkaji juga telah menyediakan dua soalan temu bual yang berstruktur terbimbing iaitu soalan pertama berkaitan kesukaran dan masalah yang dihadapi berdasarkan enam tajuk utama dalam sukatan kursus Penghasilan Teknologi Visual iaitu *Introduction To Visual Static Technology, Basic Photography, Digital Photography, Photography and Light, Basic Shooting and Composition* dan *Photography Techniques*. Manakala, soalan kedua mengenai pandangan dan cadangan pelaksanaan aplikasi mobil dalam kursus ini dari segi informasi, navigasi dan persembahan

KEPUTUSAN DAN PERBINCANGAN

Dapatan dan Perbincangan berkaitan Medium Penyampaian dalam Pembelajaran dan Pengajaran

Dapatan kajian awal menunjukkan medium perkongsian maklumat yang kerap digunakan oleh pelajar untuk berkongsi bahan pembelajaran dalam kursus Penghasilan Teknologi Visual adalah *Facebook* (60%), telefon pintar (60%), e-pembelajaran (40%), *Flick* (10%), e-mel (10%) dan *blog* (10%). Majoriti responden berpendapat medium komunikasi seperti Facebook, telefon pintar dan E-learning memberi kelebihan dari segi mudah dan cepat mendapatkan maklumat, menjimatkan masa dan wang, perbincangan secara ata talian serta bahan pembelajaran boleh diakses tanpa batasan waktu dan tempat.

Walau bagaimanapun, responden juga berpandangan medium komunikasi melalui *Facebook*, telefon pintar dan e-pembelajaran mempunyai kekangan dari segi bahan pembelajaran sukar diakses sekiranya tiada liputan Internet, sesetengah bahan

pembelajaran dalam e-pembelajaran sukar difahami dan kurang penerangan secara praktikal. Namun begitu, penggunaan peranti mudah alih menjadi semakin bermakna pada masa kini dengan adanya pengingkatan tempoh hayat bateri, mudah mengakses Internet, penambahan fungsi peranti mudah alih seperti tablet dan menaikkan bilangan pembuatan telefon pintar (Göksu & Atici, 2013). Selain itu, tumpuan responden mudah terganggu kepada laman sesawang atau rangkaian sosial atas talian yang tidak berkaitan dengan bahan pembelajaran apabila melayari Internet.

Oleh itu, antara cadangan penambahan/baikan medium penyampaian yang diutarakan oleh responden adalah bahan pembelajaran disampaikan dalam aplikasi mobil (10%), pencapaian Internet yang stabil (10%) dan menyediakan pakej Internet yang sesuai dengan mahasiswa kampus (20%).

Responden juga memberikan cadangan perbincangan secara atas talian perlulah dipantau supaya perbincangan sentiasa berfokus dan menggunakan bahasa perantaraan yang mudah difahami dan tercapai maksud. Selain itu, medium komunikasi seperti e-pembelajaran dan laman web perlulah mesra pengguna, penyampaian pembelajaran secara interaktif dan menggunakan strategi yang berkesan (10%) adalah cadangan yang diberikan oleh responden

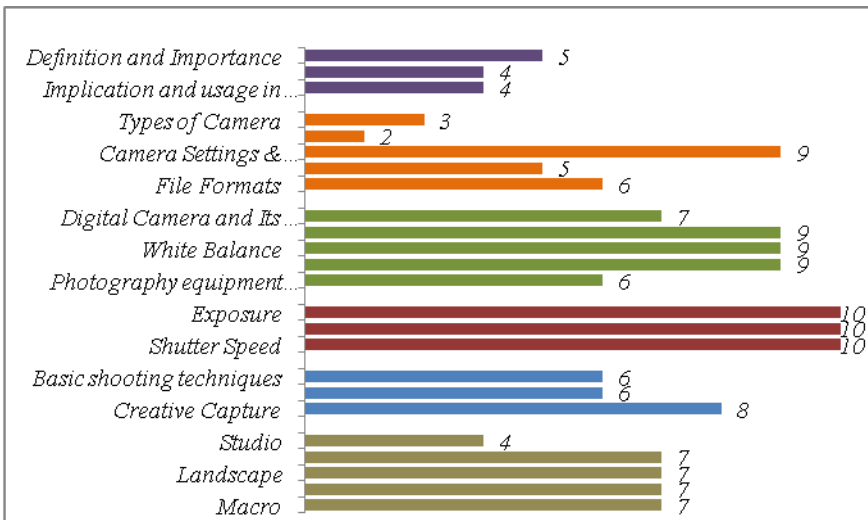
Dapatan dan Perbincangan berkaitan Pendekatan Pembelajaran Mobil

Dapatan kajian menunjukkan kesemua responden pernah menggunakan aplikasi yang terdapat dalam peranti mudah alih mereka untuk tujuan pembelajaran (50%), bersosial melalui Internet (30%) dan bermain (20%).

Antara cadangan dan harapan yang diberikan oleh responden sekiranya pembelajaran mobil dilaksanakan dalam kelas fotografi adalah seperti menyediakan aplikasi mobil yang mengandungi nota dan platform perbincangan untuk kelas fotografi. Responden juga memberi cadangan supaya menyediakan

banyak maklumat tutorial penggunaan kamera DSLR. Selain itu, responden juga menyuarakan harapan supaya aplikasi mobil fotografi boleh diakses ke Internet apabila menekan pautan yang disediakan. Cadangan lain seperti pelaksanaan pembelajaran mobil perlu melibatkan reka bentuk pengajaran seperti model ASSURE dan strategi pembelajaran untuk menggalakkan suasana pembelajaran kelas fotografi yang aktif turut dinyatakan oleh responden. Selain itu, responden juga mencadangkan supaya paparan bahan pembelajaran fotografi perlu melibatkan penggunaan multimedia untuk menjadikan proses pembelajaran lebih menarik dan interaktif.

Dapatan kajian dalam Rajah 1 menunjukkan majoriti undian sebanyak 10 orang responden telah memilih tajuk *Photography and Light* untuk dibangunkan dalam aplikasi mobil. Undian kedua tertinggi sebanyak 9 orang adalah tajuk mengenai *Camera Settings & Camera Modes, ISO, White Balance dan Lenses*. Manakala, tajuk *Creative Capture* mendapat undian sebanyak 8 orang. Selain itu, seramai 7 orang responden bersetuju tajuk seperti *Digital Camera and Its Controls, Portrait and Living, Landscape, Sports dan Macro* sesuai dibangunkan dalam aplikasi mobil.



Rajah 1: Jumlah Responden Yang Bersetuju Memilih Tajuk Kandungan yang Sesuai Dibangunkan Dalam Aplikasi Mobil

Sebanyak 50% responden menyatakan sebab pemilihan tajuk kandungan tersebut adalah kerana sesuai bagi memahami konsep-konsep asas dan teknik-teknik dalam fotografi. Selain itu, sebanyak 40% responden juga menyatakan kandungan pembelajaran fotografi sesuai diberikan dalam bentuk nota ringkas, memberi contoh berbentuk grafik, mudah difahami dan padat. Tambahan pula, kandungan pembelajaran boleh dipecahkan kepada beberapa tajuk kecil (10%), sesuai dipaparkan dalam bentuk aplikasi mobil sebagai rujukan (20%) dan boleh diakses di mana-mana (10%).

Sebanyak 90% responden bersetuju memilih aplikasi *Android* berbanding aplikasi *IOS* bagi pembelajaran mobil kerana mereka menggunakan peranti mudah alih yang mempunyai sistem operasi jenis *Android*. Tambahan pula, aplikasi *Android* mudah diperolehi dari *Google Play* atau *Play Store*, mudah dimuat turun, aplikasi percuma dan mesra pengguna.

Dapatan daripada soal selidik dikukuhkan lagi dengan dapatan yang diperolehi daripada temu bual. Dapatan daripada temu bual menunjukkan pelajar menghadapi kesukaran dalam menyatakan definisi dan istilah seperti maksud *aperture*, *ISO*, *Shutter speed*, *exposure* dan *Rule of Third*. Selain itu, pelajar juga mempunyai masalah untuk melaksanakan langkah-langkah yang betul terutamanya bagi tajuk *Photography and Light*, *Camera Setting and Camera Modes*, *Basic Shooting and Composition* dan *Photography Technique*. Menurut Davies (2006) terdapat istilah yang sukar difahami oleh pengguna seperti *aperture*, pendedahan, interpolasi, matriks, piksel dan *sensor array* yang boleh mengelirukan dan sukar untuk difahami pengguna.

Selain itu, hasil kajian menunjukkan responden menghadapi kesukaran mengendalikan kamera *DSLR* semasa membuat aktiviti mengambil gambar dalam dan luar bangunan. Selain itu, responden juga sukar mendapatkan hasil gambar yang memuaskan melalui teknik-teknik fotografi yang dipelajari dalam kelas. Semasa melakukan kerja amali, responden

muah terlupa teknik-teknik betul untuk melaraskan *ISO*, *aperture*, *shutter Speed*, pemilihan mod kamera dan penetapan kamera yang betul. Oleh itu, pelajar terpaksa mencari nota dan video rujukan dengan mengakses Internet melalui peranti mudah alih untuk mengetahui cara-cara menggunakan DSLR secara praktikal kerana nota kuliah semata-mata tidak mencukupi.

Manakala, dapatan kajian berkaitan pandangan dan cadangan mengenai pelaksanaan aplikasi mobil dalam kursus tersebut dari segi informasi, navigasi dan persembahan boleh dilihat dalam Jadual 1

Jadual 1: Cadangan rekabentuk aplikasi mobil dari segi dari segi informasi, navigasi dan persembahan

Rekabentuk	Pandangan / Cadangan
Informasi	<ul style="list-style-type: none"> • Kandungan nota menggunakan Bahasa yang mudah difahami. • Teori sesuai diberikan dalam bentuk nota ringkas. Contohnya bagi tajuk <i>Introduction To Visual Static, Visual Technology</i> dan <i>Basic Photography</i>. • Sediakan nota yang menarik. • Kurangkan penggunaan teks, lebihkan penyampaian dalam bentuk gambar. • Bagi tajuk yang ada praktikal sesuai diberi dalam bentuk video untuk menunjukkan cara-cara mengendalikan kamera, menangkap gambar, fungsi kamera, teknik-teknik fotografi • Maklumat disampaikan dalam bentuk teks, animasi, video, audio. • Maklumat boleh dipaparkan walaupun tidak perlu Internet. • Boleh rujuk nota bila-bila dan di mana-mana sahaja.
Navigasi	<ul style="list-style-type: none"> • Maklumkan kedudukan paparan yang dilihat

semasa mengeksplor.

- Sediakan pautan dari laman utama yang boleh ke semua paparan.
- Kurangkan pautan yang perlu masuk ke dalam untuk sampai ke maklumat yang dikehendaki.
- Sediakan *sidemap*.

-
- Persembahan**
- Gunakan jenis tulisan yang sesuai untuk paparan dalam telefon.
 - Menggunakan warna yang menarik dan sesuai.
 - Pilih tulisan yang mudah dibaca.
 - Reka bentuk yang mudah.
 - Pemilihan butang dan ikon yang standard.
 - Maklumat dipaparkan muat pada skrin telefon.
-

PENUTUP

Pembelajaran mobil memberi kesan positif dalam bidang pendidikan. Berdasarkan hasil kajian awal menunjukkan pelajar kelas fotografi mempunyai beberapa masalah yang telah dikenalpasti dari segi pemahaman istilah, pengawalan suntingan kamera dan pengaplikasian teknik-teknik fotografi yang betul. Selain itu, majoriti pelajar bersetuju dengan sekiranya penggunaan aplikasi mobil dijalankan dalam kelas fotografi. Pelajar juga telah memilih tajuk -tajuk fotografi yang sesuai dibangunkan dalam aplikasi mobil tersebut. Tambahan pula, pembangunan aplikasi mobil perlu mengambil kira aspek pemilihan reka bentuk pengajaran, strategi pembelajaran dan kesesuaian multimedia supaya pengetahuan dan kemahiran fotografi dapat disampaikan dengan berkesan, teratur dan menarik.

Bagi memastikan pembelajaran mobil dapat dijalankan dengan teratur dan berkesan, pembangunan aplikasi mobil

berkaitan pengetahuan fotografi perlu melibatkan perbincangan antara pelajar dan guru. Namun begitu, bahan pembelajaran fotografi yang disatukan kemudahan perbincangan dalam satu aplikasi mobil agak sukar dibangunkan kerana memerlukan tempoh masa dan kemahiran tinggi untuk membangunkan aplikasi mobil tersebut. Oleh itu, sesi perbincangan secara atas talian masih diperlukan supaya pelajar dan guru dapat berkongsi maklumat serta proses pengajaran dan pembelajaran (PdP) dapat berjalan dengan lancar. Justeru itu, kajian mengenai penggunaan aplikasi mobil dan rangkaian sosial dalam talian perlu dilakukan supaya proses PdP bagi kursus Penghasilan Teknologi Visual dapat dijalankan di mana-mana sahaja tanpa mengira masa tempat.

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PEER SCAFFOLDING IN PROMOTING CRITICAL THINKING THROUGH ASYNCHRONOUS ONLINE DISCUSSION FORUM: THE THEORETICAL FRAMEWORK

Shahizah Binti Shukri & Zaidatun Binti Tasir

ABSTRACT

The development of the technology has brought the transformation in education, particularly in the use of internet in teaching and learning. One of the opportunities is to teach and learn via online learning. The purpose of this study is to investigate the potential of peer scaffolding techniques in enhancing critical thinking through Asynchronous Online Discussion Forum (AODF). The peer scaffolding techniques are considered as the independent variable while individual critical thinking engagements are the dependent variable. This study will find out the dominant type of peer scaffolding techniques through AODF and the level of learner's critical thinking.

Keywords: Peer Scaffolding, Scaffolding, Critical Thinking, Online Learning, Asynchronous Online Discussion

1.0 INTRODUCTION

Since 1960s, the use of technology in the educational field has been widespread. The internet, according to Becker (2001), has

been playing a major role in enhancing educational technology, which has provided diverse opportunities to the education world. One of the opportunities is to teach and learn via online learning. This method has become popular since it encourages students to submit their ideas and opinions freely through discussions which is considered a powerful tool for developing pedagogical skills such as problem solving, critical thinking, collaboration and reflection. Online discussion is seen as an effective place for instructors to coach and develop a deeper and more reflective learning among learners. This method of teaching is called ‘scaffolding’, which refers to the process by which a teacher or more knowledgeable peer assists a learner, so that the learner can solve a problem or accomplish a specific task (Sharma, & Hannafin, 2007). Baran and Correria (2009) concluded that the participating students perceived peer-facilitated discussions as more meaningful and interactive because they felt that their contributions have created a strong sense of community. Thus, this research explores the critical thinking developed by peer scaffolding patterns through an asynchronous online discussion forum (AODF).

1.2 PROBLEM STATEMENT

AODF have become an integral part of teaching and learning in higher education. However, several studies have identified problems related to online discussions, such as limited student participation, inadequate critical analysis of peers’ ideas, lack of motivation, commitment, and time, and failure to communicate effectively (Hewitt, 2005; Rourke & Anderson, 2002; Brooks & Jeong, 2006). Abawajy (2012) emphasized that AODF does not necessarily bring about effective interaction or collaborative learning. For this reason, tutors and instructors play a critical role in an online discussion environment because their domination may result in an instructor-centered discussion, which suppresses students’ active participations (Rovai, 2007). As “more-capable peers”, learners will put more effort to help because they perceive

that peers would not judge them the same way as their lecturers would (Wass, Harland & Mercer, 2011).

Scaffolding represents the support given to attain a goal. However, not all students prefer to have their instructors involved in an online discussion because such an involvement may be oppressive to certain students; thus, peer facilitation may be preferred (Fauske & Wade, 2003). Apart from being seen as the best way to create an effective learning environment, peer scaffolding can also automatically improve a learner's critical thinking. Harrington and Hathaway (1994) reasoned that peer facilitators would remove any power imbalances in the discussions, and they can also encourage freedom of expression, and give students the feeling that they own the discussions.

Therefore, this research will use peer scaffolding techniques to promoting critical thinking through AODF. This research will identify the dominant type of peer scaffolding among learners and to find the learner's level of critical thinking.

1.3 THEORETICAL FRAMEWORK

The theoretical framework of this research is presented in Figure 1.1, with scaffolding being the theoretical base of this study.

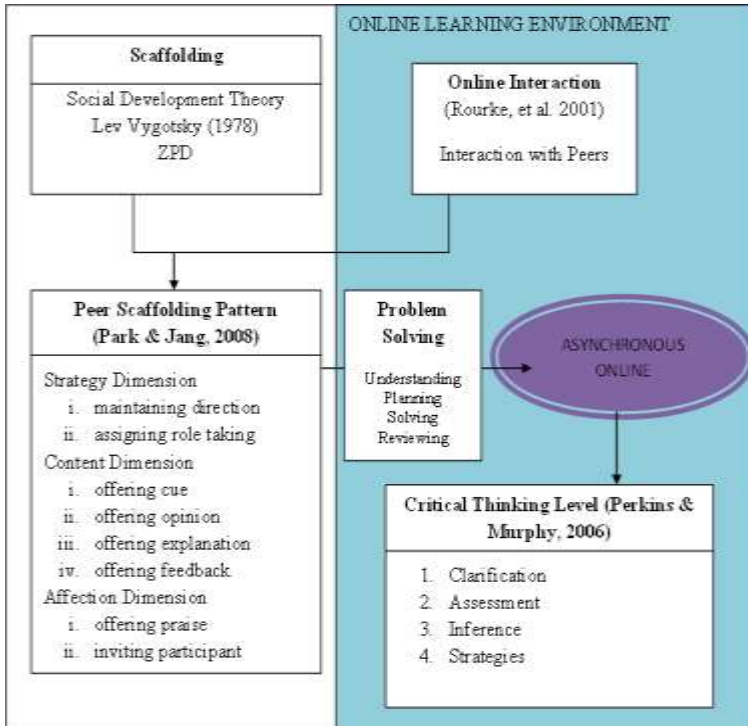


Figure 1.1 : Theoretical framework

Scaffolding was introduced in 1978 by Lev Vygotsky, who also introduced the Social Development Theory. To point out, the theory focuses on the basic theme of The Zone of Proximal Development (ZPD), which are (1) the distance between a student's ability to perform a task under an adult guidance and/or with peer collaboration, and (2) the student's ability to solve a problem independently.

Vygotsky believed that peer collaboration and other forms of peer-assisted teaching can enhance a student's learning (Velez et.al, 2010). Thus, peer scaffolding techniques are seen as better alternatives than instructional scaffolding because not all students prefer to have instructors involved in their online discussions.

Park and Jang (2008) for instance, have promoted a peer scaffolding pattern which consists of three main dimensions:

strategy dimension, content dimension and affection dimension. Park and Jang (2008) then come out with a coding scheme that was formed in the presence of problem-solving processes in a web-based instruction. Hence, table 1.1 shows the peer scaffolding pattern by Park and Jang (2008).

Dimension	Types
Strategy	Maintaining direction
	Assigning role taking
Content	Offering cue
	Offering opinion
	Offering explanation
	Offering feedback
Affection	Offering praise
	Inviting participation

Table 1.1 : Peer scaffolding pattern

Xie, (2006) hypothesized that by interacting with peers through online collaboration; students will perform better in problem solving. Problem solving can be viewed as a learning outcome and as a process (Mayer & Wittrock, 1996). Park and Jang (2008) have presented four phases of a problem solving process. The four phases are understanding, planning, solving, and checking. Hence, these four phases of problem solving existed in order to find the pattern and types of peer scaffolding, and they are practiced during group problem solving activities.

Critical thinking affects all forms of communication; it can be practiced daily in an interaction and it is widely acknowledged that the level of the skill, along with problem solving ability, can be enhanced by online discussions. Perkins and Murphy (2006) pointed out four levels of critical thinking: clarification, assessment, inference and strategies. These four levels are elaborated as follows:

- i. Clarification: All aspects of stating, clarifying, describing (but not explaining) or defining the issue being discussed.
- ii. Assessment: Evaluating few aspects of the debate: making judgments on a situation, proposing evidence for an argument or for links with other issues.
- iii. Inference: Showing connections among ideas: drawing appropriate conclusions by deduction or induction, generalizing, explaining (but not describing), and hypothesizing.
- iv. Strategies: Proposing, discussing, or evaluating possible actions.

Perkins and Murphy's (2006) models were highly recommended by researchers since they have been used to identify individual learners' engagement in critical thinking. Susan (2009), for example, has used the models to measure critical thinking process in an online discussion because the models focus more on cognitive behaviours. Corich (2011) also suggested using these models, which focus on individual's engagement. Of the models that have been used to measure critical thinking, most have been applied to groups of participants to measure aggregate group performance; yet, very few studies have attempted to measure an individual's critical thinking activities (Corich, 2011). The models present a deeper concept of critical thinking processes and provide a clearer picture on how students are engaged.

1.4 CONCLUSION

Education systems nowadays has further itself from classroom context towards online learning. AODF provides an opportunity to facilitate a learner's critical thinking that can be promoted through the interaction. The online discussion can aslo be stated as a conducive environment for critical thinking through the process of interaction, reflection and feedback during teaching and learning

process. However, studies have shown that learners do not consider facilitator and instructor as important in online environment but they preferred peers. As a conclusion, it is good to have another method in scaffolded learners such as peer scaffolding . Thus, this research is primarily about exploiting the potentials of peer scaffolding in generating the learner's critical thinking ability.

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CONCEPTUAL FRAMEWORK OF VIDEO LEARNING PRACTICES TO ENHANCE STUDENTS' CRITICAL THINKING SKILLS IN ACTIVE LEARNING ENVIRONMENT

Nurul 'Izzati Hamizan, Norasykin Mohd Zaid & Norah Md Noor

ABSTRACT

Universiti Teknologi Malaysia, in collaboration with Massachusetts Institute of Technology (MIT), has developed a video learning approach under a project known as Blended Learning Open Source Science or Math Studies Initiative (BLOSSOMS). The approach has been developed as an alternative to the current materials used in teaching and learning processes. This research was conducted to investigate the framework of video learning practices in enhancing critical thinking skills developed among university students through the integration of a learning video. One BLOSSOMS video entitled "Is There a Connection between Computer Network Topologies and a Malaysian Wedding?" was selected for the experimental research study. Forty five students from the Faculty of Education were selected to be involved in the research. The respondents were chosen based on convenient sampling as they came from the same course and educational background. The data was then analyzed using quantitative and qualitative methods; and also content analysis was done with the help of the elements in Ennis's critical thinking abilities. Hopefully, the findings will show that the BLOSSOMS video affected the students' achievement and critical thinking skills thus the framework of video learning practices can be formed.

Keywords: Active Learning; Critical Thinking Skill; Video Learning Practices

1.0 INTRODUCTION

Educational institutions of the 21st century are facing many challenges in improving student performance to encounter new upcoming challenges for the young generation (Mercer, 2007). With such a big task to handle, educational institutions must ensure the quality of education provided for students in all levels are in line with the hopes of parents towards their children's future.

Thus, educators cannot simply rely on traditional teaching methods to prepare the students for future job environments. Instead, more innovative methods in learning and teaching such as video, animation, simulation and others should be identified according to the requirements of the environment in this era of technology (Balasubramanian, Wilson, & Cios, 2006). As stated by Simpson (2005), children today consistently play video and computer games, watch music television (MTV), use instant messaging and watch action movies. The actions that take them out of this familiar environment may impact their motivation and attention. This is because younger generation nowadays demands new ethics or methods in teaching and learning such that the process can grab their attention to be more collaborative, global and comprehensive in the knowledge itself (Brownell, Adams, Sindelar, & Waldron, 2006).

2.0 VIDEO AND ANIMATION

Video is not a new teaching tool in the field of education. Many researchers have clarified the benefits of using video in learning processes. Although the use of learning videos has been widely employed in the past years, recently, the interest towards this

method is seen increased. Millions of learners watch videos from different platforms (e.g. YouTube, Vimeo, Khan Academy, BLOSSOMS and etc.) on various terminals (desktop, phone, tablet). Students access academic content via digital libraries; have discussions with tutors by email and attend online courses from their homes (Giannakos, 2013). With respect to subject area, Giannakos, (2013) explained in his findings that the language domain is dominant in video-based learning research.

However, interest in the domains of information and communication technology (ICT) increased in the second period (2007 – 2012) under his investigation. This is expected as there are a lot of researches that found the benefits of video in learning such as providing students with sources of information (Pekdağ, 2010), bringing into language learning the real life & real interlocutors (Can, 2006), and enhancing towards productions into the collaborative learning environment (Roberts, 2004). Meanwhile, students also describe video based learning as useful, helpful and effective, as well as enjoyable, motivating, and stimulating (Kay, 2012). Wachob (2011) indicated that activities using videos based on technology, can integrate critical thinking skills and other skills such as reflection, evaluation, critique, listening, speaking and writing. These critical skills, along with higher levels of motivation, are prerequisites to learners' autonomy.

2.1 CRITICAL THINKING

In 2006, it was estimated that there were 60,000 unemployed local graduates in Malaysia (NST, 2006). This issue has grabbed the attention of many parties to try and take action to overcome the issue, which also shows how serious this issue was. One of the major causes identified is the lack of soft skills among graduates, which makes them unable to compete in the current competitive job market. The focus on the areas of soft skills which they seem to be lacking include critical thinking, communications,

presentations, leadership, teamwork, interpersonal skills, management skills, time management and problem solving skills (Aminuddin Baki et al., 2008).

As stated by Baki et al., (2007), critical thinking skills are very important to survive in any industry in order to be able to process the straightforward information accurately, work to meet the targets in an organized and consistent manner, focus on tasks and make an effort to avoid inefficiency. Critical thinking is about how the people approach the problems, questions and issues. It is the best skill to have to get to the truth. Although many people once believed that we are born either with or without creative and critical thinking abilities, research has shown that these skills are teachable and learnable (Cotton, 1991).

Based on meta-analysis on 117 researches about critical thinking, there are 5 basic methods to measure critical thinking (Abrami et al., 2008), such as:

- i. Standardized tests - The most famous and popular critical thinking appraisal in measuring critical thinking for example The California Critical Thinking Skills Test (CCTST), Watson Glaser Critical Thinking Appraisal (WGCTA), Cornell Critical Thinking Test, Level Z (CCTT).
- ii. Test and evaluation conducted by researchers – This method focuses more towards content analysis, interview analysis and open ended questions to see the development of critical thinking skills.
- iii. Tests developed by more than one researcher – It is not a standardized method in measuring students' critical thinking for example in the research of Bonk, Angeli, Malikowski, & Supplee (2001).
- iv. Tests developed by a researcher – Researchers are involved in teaching certain courses thus at the same time they develop the test.
- v. The second source of measurement – The instrument is taken from other references either the researcher translates the test or just takes the exact same test based on research

requirement.

There are a lot of critical thinking measurements that have been developed by other researchers. Table 1 shows meta-analysis on standardized test of critical thinking.

Table 1 Meta-analysis on standardized test of critical thinking

N o.	Model	Source	User	Aim
1	Cornell Critical Thinking Test, Level X	Ennis, Millman, & Tomko (2005)	Grade 5 until grade 12	To test about experience
2	Cornell Critical Thinking Test, Level Z (CCTT)	Ennis, Millman, & Tomko (2005)	Grade 10 until grade 12	Predicts student's future performance in honor, in critical thinking classes, college admission and career situation
3	Watson Glaser Critical Thinking Appraisal (WGCTA)	Watson & Glaser (2002)	Tertiary and graduate students	Measure high level reasoning and critical thinking. Predicts judgment, problem solving and decision making. Classifies individual as low, average and high. Used by major corporations & consultants
4	The California Critical Thinking Dispositio	Facione & Facione (1992)	General adult population	To measure the disposition to engage problems and make decisions using critical thinking.

	ns Inventory (CCTDI)			
5	The California Critical Thinking Skills Test: College Level (CCTST)	Facione (1990)	College student s	To measure participants' skills in six subscales (analysis, inference, explanation, interpretation, self- regulation)
6.	Ennis Critical Thinking Abilities	Ennis (1986)	Elemen tary to higher educati on	12 abilities indicate ways of avoiding making a mistake in evaluating when selecting the only right answer

Based on the list of the tests above, Ennis Critical Thinking Abilities identified by Ennis, (1986) seem like the most suitable test in measuring students' critical thinking skills when compared with others and was chosen to be used in this research. This is because Ennis Critical Thinking Abilities contains 12 abilities that are (i) meaningful, (ii) clear, (iii) consistent, (iv) logical, (v) precise, (vi) following rule, (vii) accurate, (viii) justified, (ix) relevant, (x) assumption, (xi) well-defined and (xii) true. Here, the researcher can evaluate and observe the skills that the respondents use in order to obtain the accurate answer based on the 12 abilities from Ennis Critical Thinking Abilities.

2.2 BLOSSOMS

Blended Learning Open Source Science or Math Studies (BLOSSOMS) is known as a shared teaching method of

a “Teaching Duet”. There is a “guest teacher” appearing in the video whereby each film is designed to be watched in short, five-minute segments which allows the in-class teacher to ask his or her students questions and run through various exercises. After each exercise has been completed, the teachers can turn the video back on and progress to another segment (R. C. Larson & Murray, 2008).

“BLOSSOMS interactive video learning modules” are partnering with educators of Jordan and Pakistan, faculty members, graduate students and high school teachers to create such a beautiful lesson. These developed video modules are not intended to replace existing curriculum content but rather to enhance development of critical thinking skills by the lively video presence of a gifted ‘guest lecturer,’ moving away from rote memorization and ‘teaching to the test’ (R. C. Larson & Murray, 2011).

Massachusetts Institute of Technology (MIT) stated that BLOSSOMS videos have enriched student’s learning experiences in high school classrooms from Brooklyn to Beirut to Bangalore. The Video Library in MIT contains over 50 math and science lessons, all freely available to teachers as streaming video and internet downloads in the form of DVDs and videotapes. Video Library is in the form of website and are freely open accessed all over the world for interested parties to browse and download the lessons to be used in classes anytime and anywhere. Every video lesson is a complete resource which includes segments, a teacher’s guide, handouts and a list of additional online resources relevant to the topic. BLOSSOMS video was created to make teaching and learning activities in classrooms become alive.

Aris et al., (2013) claimed that BLOSSOMS video lessons are interactive in nature with planned activities and hands-on experience that engage students in critical thinking and problem solving. So, the purpose of this research is to determine whether the critical thinking among university students is improving by integrating BLOSSOMS video learning as a pedagogical tool in an active learning environment.

2.3 CONCEPTUAL FRAMEWORK

Below is the example of the conceptual framework of this planned research. To obtain significant results, there will be 3 matters involved which are concepts, tools and the outcome. The concepts or elements used in this research are Bloom's Taxonomy of Higher Thinking and Ennis Critical Thinking Abilities. Bloom's Taxonomy of Higher Thinking which contains the elements of knowledge, comprehension, application, analysis, synthesis and evaluation (Bloom, 1956) will be implemented in developing assessment questions. While Ennis Critical Thinking Abilities (Ennis, 1986) contains the abilities of (i) meaningful, (ii) clear, (iii) consistent, (iv) logical, (v) precise, (vi) following rule, (vii) accurate, (viii) justified, (ix) relevant, (x) assumption, (xi) well-defined and (xii) true. These abilities will be used to detect the respondent's critical thinking skills in the assessment test.

In another scope, the video will act as a tool. The video in use contains the elements of critical thinking skills which can encourage students to think deeply, holistically and at the same time provides the real life demonstration method to explain the concept. In addition, the activities provided in the video contains task-based learning concept which have more tendency to obtain or develop the soft skills among the students (Mohd Fairuz Iskandar, Nazrulazhar Bahaman, Zulkiflee Muslim, & Faizal Abdollah, 2008) especially in leadership, teamwork and communication. Other than that, the video also contains element of animation, which can ease the problem of complicated knowledge and grab students' attention thus making the video become more attractive and effective (Manal Abdullah & Aisha Ehsan, 2012). Below is the proposed conceptual framework for this research.

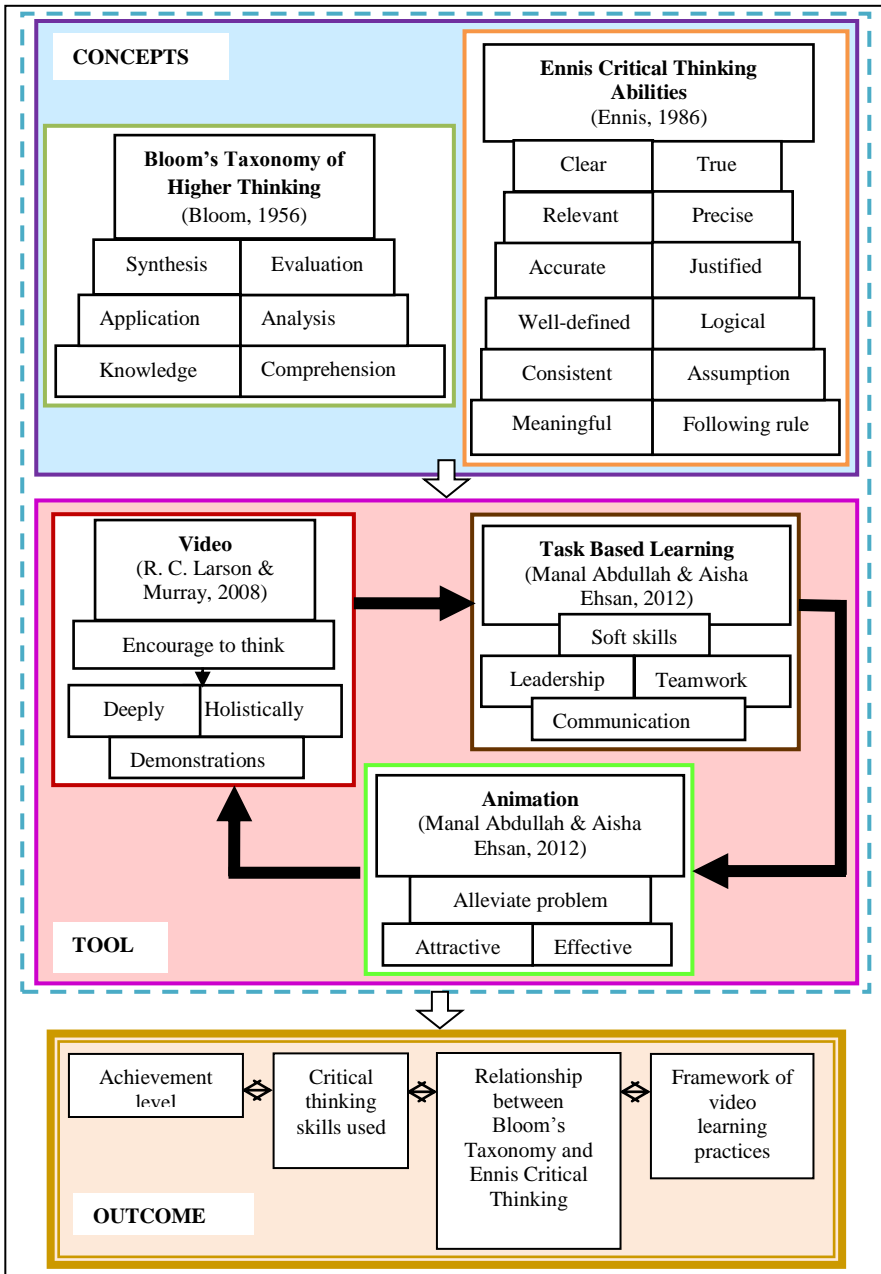


Figure 1 The proposed conceptual framework

3.0 METHODOLOGY PLANNED/USED

This research will use the experimental research design method which is quasi experimental in design. Both qualitative and quantitative data will be used in order to triangulate the results from the experiment. This research will involve three phases as followings:

Phase 1: Analysis Phase

This phase will cover two types of tests, pre-test and post-test, which aim to reflect user's understanding of the experiment topics. The pre and post-test instrument consists of questions related to the content in the learning video. These questions contain 4 structured questions which reflect the topic content and task-based learning concept contained in the video.

Phase 2: Experimental Phase

In the experimental phase, the experimental group will be exposed towards BLOSSOMS video in the class while the control group will be exposed with traditional teaching chalk and talk learning method. This is used to identify whether BLOSSOMS video gave any effect in students' critical thinking skills. Consequently, the BLOSSOMS video with the title "Is There a Connection between Computer Network Topologies and a Malaysian Wedding?" was selected to be used during the experimental research study.

Phase 3: Data Collection Phase

In this phase, the post-test will be distributed among the respondents; including both the control and experimental group. Then, the respondents in experimental group are required to answer the questionnaires that govern the perceptions toward

BLOSSOMS video. The interview session will then be conducted outside of the class within the experimental group, individually.

4.0 EXPECTED RESULT

The results expected from this research include the following:

- An increase in the student's level of achievement after using BLOSSOMS video during learning process
- Few elements of critical thinking abilities can be identified from the assessment test
- Critical thinking abilities can be categorized under the element of Taxonomy Bloom.
- The framework for learning practices using BLOSSOMS can be established

5.0 CONCLUSION

This research is planning to develop a blended learning environment among the students in order to create an active learning environment and encourage students to think critically.

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CONCEPTUAL FRAMEWORK FOR VIDEO-BASED LEARNING EMBEDDED WITH COGNITIVE CONFLICT STRATEGIES TO REDUCE STUDENTS' MISCONCEPTION

Radhiah Ab Rahim, Norah Md Noor & Norasykin Mohd Zaid

ABSTRACT

Video has been used in different ways for many years to support student learning in all branches of education. Furthermore, the introduction of websites such as YouTube, Google video, Vimeo and TeacherTube has led to much greater and easier access to a wealth of digital video material, of varying quality and content on numerous topics most of which is freely available to students and lecturers. There are also numerous videos that have been specifically made for educational purposes, made by academics themselves. So this research tries to suggest a video-based learning framework embedded with cognitive conflict strategies that able to change students' existing schema based on literature review. The framework explained how to develop a video based on cognitive conflict strategies in order to understand actually how the video correcting students' misconceptions in learning based on conceptual change process. Misconception is a situation where students have understood certain concepts in the wrong way and usually those who are in this situation refuse to change to the correct one. Misconceptions should be viewed as opportunities to create a more meaningful learning process. Posner, Strike, Hewson, and Gertzog (1982) had developed a conceptual change model and it explains a process where a learner changes his/her

conceptions by assimilating or accommodating the existing schemas. To trigger the conceptual change process, cognitive conflict strategies need to be attempted through any way, including using learning situations presented through video-based learning materials.

Keywords: Misconception, Cognitive Conflict Strategies, Conceptual Change, Video Based Learning

1.4 INTRODUCTION

New technologies, such as computer-based technologies, are able to bring a wonderful and interesting experience in teaching and learning that benefits both the teachers as well as the students. Multimedia learning tools are introduced to enhance teaching techniques in order to encourage students' learning. This includes any media that can be used in teaching instruction. Multimedia learning tools that are integrated with text, graphics, audio, video and animation make for a more interesting experience and easier understanding of a concept (Ismail Zain, 2003).

Other than that, using video as a learning material has been employed in many ways for many years to support students' learning. Although the use of learning videos has been widely employed in past years, recently the interest has increased incrementally (Giannakos, 2013) due to video-sharing sites such as YouTube, Vimeo, and TeacherTube. Since its launch in 2005, YouTube has become one of the popular free video-sharing websites because it enables users to create, upload, and share their video (D. Y. Lee & Lehto, 2013). The free video-sharing website for user-created content (UCC) or user-generated content (UGC) has led to greater access and easy reachability to a wide variety of learning materials (Y. M. Chan, Choo, & Woods, 2013; Chtouki, Harroud, Khalidi, & Bennani, 2012; D. Y. Lee & Lehto, 2013).

In short, students need up-to-date learning and teaching styles that can nurture them towards creativity and innovation in

line with the modernization era. Thus, video-based learning environments can help to stimulate students to explore what they have learned in a more interesting approach. Therefore, it is undeniable that video brings many advantages. It can be said that this approach is both wonderful and motivating; a learning material that is very suitable for the processes of teaching and learning today.

1.5 VIDEO- BASED LEARNING

Digital video is an exciting emerging technology that can be used in learning to support, extend, or change pedagogy and curriculum outcomes. Video has been used in different ways for many years to support student learning in all branches of education (Barbara et al., 2010). There are also numerous videos that have been made specifically for educational purposes, which are made by academics themselves.

There is a lot of research that highlight the tendency of educators in using video to support students' understanding in learning process. With respect to subject area, Giannakos, (2013) explained in his finding that the language domain is dominant in video-based learning research. However, interest in the domain of information and communication technology (ICT) increased in the second period (2007 – 2012) under his investigation. Almost half the studies in Kay, (2012) (n = 22) examined cognitive attitudes towards video podcasts, and over 85% of the findings were positive. Students thought that video-based learning were useful, helpful, and effective with respect to improving the learning process.

However, how the video should be used in learning and what is actually the best framework that affects learners' performance remained unanswered.

1.6 FLIPPED CLASSROOM APPROACH

Based on the research by (Norah, Nurul 'Izzati, & Radhiah, 2013), they found that visual learners prefer using video before class, which is known as a flip classroom approach. The strategy of 'flip classroom', in which the lectures are moved from inside class to outside class (Dementry, 2010) is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before class session, while in-class time is devoted to exercises, projects, or discussions. The use of video like putting lectures under the control of the students: they can watch, rewind, and fast-forward as needed. It seems to result in increased active learning and students' engagement (Stone, 2012), increase students' motivation in learning (Butt, 2014), as well as show promising performance (Findlay-thompson & Mombourquette, 2014; Tune, Sturek, & Basile, 2013).

According to Findlay-thompson & Mombourquette, (2014) viewing the recorded videos outside class time are not enough to make the flip classroom model successful. Rather, it is how teachers integrate these instructional videos into an overall approach that makes the difference.

1.7 MISCONCEPTION IN LEARNING

For the past 40 years, many researchers have studied students' misconceptions in various topics of education. Conceptually, misconceptions occur when students misinterpret concepts learned in the classroom (Gilbert et al., 1998; Johnstone, 2000). In other words, students' conceptions of scientific issues are often not in line with the accepted scientific thinking. Worse than this, students' preconceptions are hard to change because their biases are not just mistakes or false beliefs, but are retained as their own cognitive thought, and they defend against the truth (Driver et al., 1994).

1.8 CONCEPTUAL CHANGE

Conceptual change is different than knowledge acquisition because the former occurs if there exists a prior knowledge and the person who has misconceived this certain type of knowledge is aware of his or her misconception and is willing to evolve his or her understanding towards a correct conceptualization (Kabaca, Karadag, & Aktumen, 2011).

(Posner, Strike, Hewson, & Gertzog, 1982) developed a conceptual change model and it explains a process where a learner changes his/her conceptions by assimilating or accommodating the existing schemas. The conceptual change model suggests that a necessary term of conceptual change is that the pupils have to be dissatisfied with the conceptions they are presently taking. It is less likely for a pupil who is satisfied with their current conception to accept a new conception that conflicts with the current one.

Another way to think about this is to regard existing knowledge as “capturing” new knowledge (P. W. Hewson, 1981). Conceptual change means replacing misconceptions with correct conceptions. One perspective on the issue is that teaching causes learning; if no learning occurs, then you could not have been teaching. Possible consequences of this are a blurring of the distinction between teaching and learning. Some teachers use the terms interchangeably or in combination, for example when focusing on teaching strategies at the expense of learning activities because of the implied assumption that “if I taught well, my students will have learned what I wanted them to.”

Hewson, (1981) mentioned the two major parts of the conceptual change model as follows;

- i. A set of conditions that defines the status of the concept that needs to be satisfied in order for an individual to experience conceptual change.
- ii. A person’s conceptual environment that provides the framework in which the conceptual change happens, influences the change process, and yields a substance to the alteration itself.

To explain more about the conditions, Hewson and Thorley, (1989) stated the conditions as follows;

- i. Is the conception intelligible (meaningful) to the learner? That is, does the learner know what it stands for?
- ii. Is the conception plausible (truthful) to the learner? That is, does the learner also believes that it is genuine?
- iii. Is the conception fruitful (useful) for the learner? That is, does a conception achieves something of value for the learner? Does it solve otherwise insoluble problems? Does it suggest new possibilities, directions, and ideas?

To trigger the conceptual change process, cognitive conflict strategies can be used. The Conceptual Change Model proposed by Posner et al., (1982) and Hewson and Hewson (1984) is one of the most widely accepted and influential theories containing underlying Cognitive Conflict teaching strategies. Based on the works of Chan et al., (1997), Limón (2001) , and Strike and Posner (1992) the implementation of Cognitive Conflict Strategies to foster conceptual change is based on the following four key elements which are as follows:

- i. Making students aware of their existing concepts before instructional intervention,
- ii. Confronting them with contradictory information,
- iii. Using anomalous data or discrepant events to replace prior concepts with scientifically accepted ones, and
- iv. Measuring the resulting conceptual change.

1.9 COGNITIVE CONFLICT STRATEGIES

There is much research related to Cognitive Conflict Strategies in science and mathematics education that has been proven to improve students' performance and misconception. Lee & Kwon (2001) stated that cognitive conflict process occurs when a student experience three activities; (i) recognizes an anomalous situation, (ii) expresses interest or anxiety about breaking up the cognitive difference, and (iii) engages in cognitive reappraisal of

the situation. The summary is shown in Figure 1.

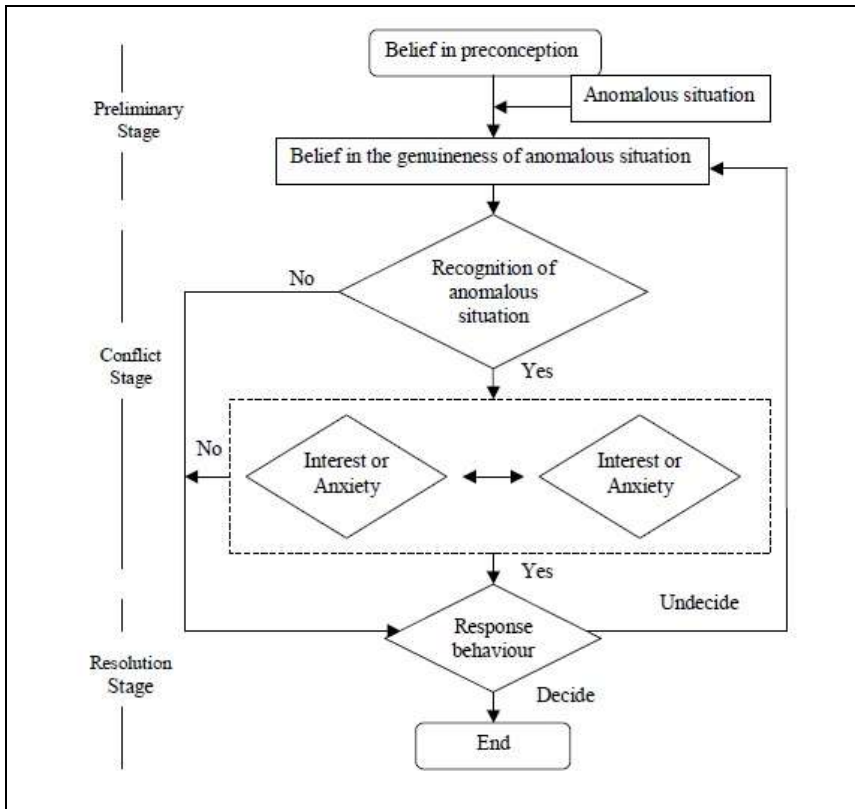


Figure 1 Cognitive Conflict Process Model (Lee & Kwon, 2001)

A pupil first recognizes that the anomalous situation is inconsistent with their concept, and then the student would be interested in or anxious around this state of affairs, which will reappraise the cognitive conflict situation and decides to resolve or ignore it.

The Cognitive Conflict Strategy is believed can be beneficially employed when developing multimedia learning material. Even so, the elements of Cognitive Conflict Strategies

that are usable within the video are still an ongoing inquiry. Radhiah, Norah, & Norasykin, (2014) conducted a meta-analysis to investigate the elements of Cognitive Conflict Strategies that could be embedded within a video to effectively reduce students' misconceptions based on detailed literature. They used the following key words to search for related publications: misconception in learning, cognitive conflict strategies, conceptual change process and multimedia learning material. Literature was conducted via Science Direct, Web of Science, ProQuest and IEEEExplore Digital Library. They identify five elements of Cognitive Conflict Strategy, which are (1) Meaningful information, (2) Challenges student's existing concept, (3) Able to gain attention, (4) Motivation, and (5) Comfortable while using it that need to be considered when developing multimedia learning as shown in the following Table 1.

Table 1. Literatures on the elements of cognitive conflict strategy

No.	Element of Cognitive Conflict Strategy	Description	Study
1	Meaningful information	Learning materials should have high efficacy for giving clear concept to students.	(Gyoungho Lee et al., 2003; Mustafa Başer, 2006; Nilsson & Castro, 2013)
		Capability to introduce contradictory information to induce cognitive conflict.	(S. Kang, Scharmann, & Noh, 2004; Gyoungho Lee et al., 2003)
2	Challenging students' existing concept	Identify students' current state of knowledge.	(S. Kang et al., 2004; Mustafa Başer, 2006)
		Focus on condition that promotes a	(Baddock & Bucat, 2008;

		situation where the existing concept can be explicit.	Kabaca et al., 2011; S. Kang et al., 2004)
3	Ability to gain attention	Provide situational interest by identifying students' characteristics.	(Baddock & Bucat, 2008; H. Kang, Scharmann, Kang, & Noh, 2010; Nilsson & Castro, 2013)
4	Motivation	Provide situation that makes students feel curious about the topic to motivate learning process.	(Kabaca et al., 2011; Gyoungho Lee et al., 2003)
5	Comfortability in using the multimedia learning materials	Provide the ideas that are able to bring cognitive conflict to become lighter.	(Baddock & Bucat, 2008)

These five elements of Cognitive Conflict Strategies as shown in Table 1 should be consider to be applied when developing multimedia learning material in order to overcome the misconception.

1.10 CONCEPTUAL FRAMEWORK

Using video to present scientific concepts in a clear, well-illustrated way might cause students to believe they are learning, but they do not engage with the media on a deep enough level to realize that what was presented differs from their prior knowledge. This might cause by misconception where students have understood certain concepts in the wrong way. As discussed earlier, many studies have identified that Cognitive Conflict Strategies can be adapted in a learning environment to reduce the misconception by enhancing student conceptual change process.

For this purpose, video can take full advantage of the learning practice and raise the effectiveness and quality of learning itself (Somekh & Davies, 1991). With that in mind, videos for learning embedded with elements of Cognitive Conflict Strategies, can give a lot of benefits to the education field.

Designing videos can engage all the learning aspects; cognitive, affective and psychomotor, which helps students' learning. For that reason Cognitive Conflict are preferable strategies for encouraging students to enhance their mental framework. These strategies can help students to go forward with a correct concept in mind and allow them to avoid more misconceptions occurring during the learning process. Donn (1989) reported, students like using a meaningful learning strategy when reacting to novel problems with self-questioning and by relating and elaborating ideas. An-Nady (1987) claimed that a drama video can provide a meaningful learning strategy because they are able to be watched, heard, thought and felt at the same time when student watched them This means that the effectiveness of a combination of Cognitive Conflict Strategies along with the worthwhile benefits of video may lead to a more meaningful student learning process.

In addition, the benefits of video in learning and flipped classroom approach are merged together to foster student performance. Nowadays, students like to gain knowledge via video because from their viewpoint, concentrating on short lecture videos at home is easier than listening to an hour long talk in a lecture hall (Chiu & Lee, 2009) For that, flipped classroom approach is a suitable to be applied in learning. The summary based on Figure 2.

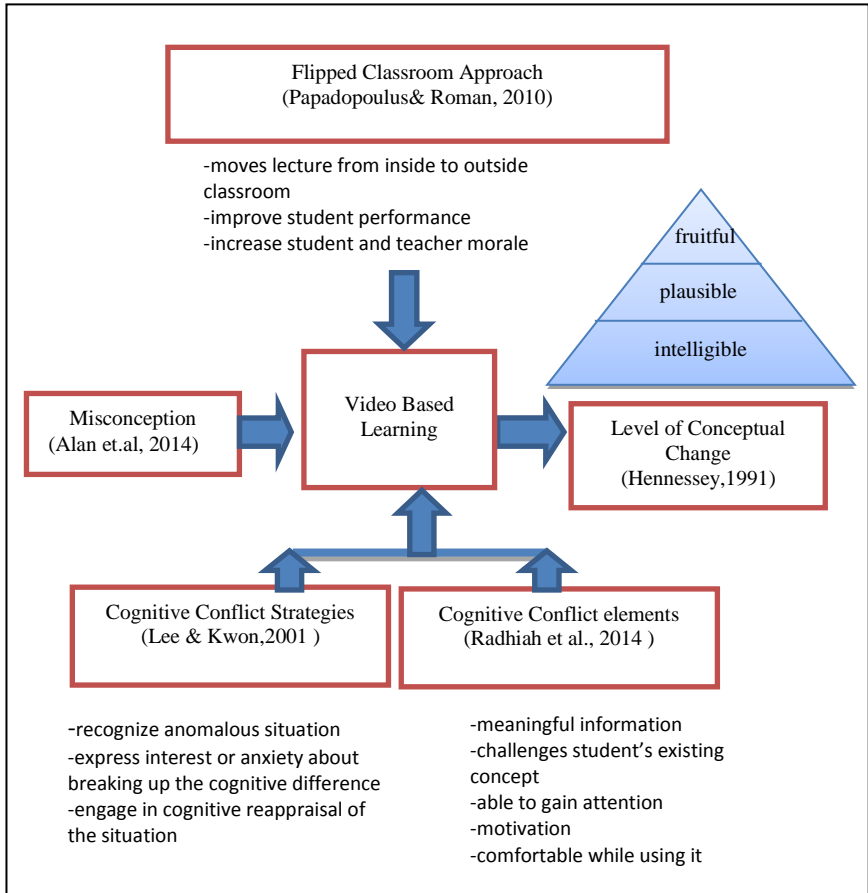


Figure 2 : The proposed conceptual framework

So, expectedly, the learning video embedded within Cognitive Conflict Strategies is developed to make students feel anxious and start the response in the conceptual change process. As a result, the students' concept will be corrected after they are engaged in cognitive reappraisal of the situation and reduce their misconception. This can give implication on increasing student performance.

1.11 CONCLUSION

This research is planned in order to develop a video based learning that can help to encourage a positive conceptual change among students. The literature suggests that the video should be embedded with cognitive conflict strategy as it had been claimed to improve students' misconception. Besides, the flipped classroom approach should be used as it has shown many positive outcomes among learners. Hopefully, the development of video based learning as shown in the conceptual framework can really help to foster student conceptual change process by reducing their misconceptions. If the finding is positive, this study will become another success story on using multimedia, especially video that will improve the quality of education nationwide.

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CHALLENGES IN THE 21ST CENTURY TEACHING: INNOVATIVE INSTRUCTIONAL LEADERSHIP PRACTICES AS A SOLUTION

Abd Rahim Bin Abdul Rahman, Lokman Mohd Tahir

ABSTRACT

In the globalization era of education, instructional leadership practices remain relevant and can contribute to the success of a school. The Malaysia Education Blueprint (PPPM) from 2013 to 2025, has been to ensure the effectiveness and sustainability of the transformation of the education system. One of the main goals of this blueprint is to reduce the administrative burden so that principals can focus on instructional leadership practices. School leaders need to fulfill their role as administrators and instructional leaders to make improvements and monitor the progress of a school on an on going basis. Thus, the principal is suggested to make changes and improvements in his instructional leadership and learning practices. However, in order to continue the existence of innovation, the leaders' ability to innovate should be emphasized. Innovative leaders are individuals who drive growth by putting new ideas in their action in all aspects of the organization or functions. Since instructional leadership and innovative leadership practices are very significant to the excellence of the school, they are considered as viable alternatives for school leaders to implement them effectively, especially in schools in Johor. Hence, a study to look at innovative instructional leadership practices is essential in order to generate new ideas and creativity for making change. So this study tries to review innovative instructional leadership practices amongst school

leaders in order to realize successful change and innovation in schools.

Keywords: Instructional Leadership , Innovative Leadership, Principals

INTRODUCTION

In the globalization era of education, instructional leadership practices remain relevant and can contribute to the success of a school (Hallinger, 2005; Department of the Prime Minister, 2010). The Malaysia Education Blueprint (PPPM) from 2013 to 2025, has been designed by the Ministry of Education (MOE) to ensure the effectiveness and sustainability of the transformation of the education system. One of the main goals of this blueprint is to reduce the administrative burden so that principals can focus on instructional leadership practices (Jamelaa Bibi, 2012). The blueprint delineates that, school leaders will be guided by the District Education Office and the Department of Education through a professional collaboration effort that focuses on school improvement and the development of the school staff's potentials and capabilities. Accordingly, the principal is required to be an excellent instructional leader and act as an agent of change in order to move the organization forward in the academic and co-curricular activities.

An instructional leader is an individual who is responsible for organizing, developing and ensuring positive attitudes toward school change (Kursunoglu and Tanriogen, 2009). In the Malaysian educational scene, instructional leadership has begun to gain a place among the leaders of the school because it is instrumental in creating/developing effective schools (Sazali, Rusmini, Abang Hut and Zamri, 2007). Alimuddin (2010) notes that instructional leaders who act as agents of change are successful in creating a

conducive school environment, which would significantly result in students' comprehensive excellence.

INSTRUCTIONAL LEADERSHIP

There is a variety of definitions that have been discussed in almost all studies on instructional leadership. According to Lunenburg and Ornstein (2008), it is common that the definition of instructional leadership is discussed in these studies by the different researchers. Yet the majority of the definitions fall under the same framework and can be summarized as leaders who lead the learning community. For example, Abdul Ghani Abdul Rahman and Mohammed Zohir (2010) define instructional leadership as the ability of the leaders to focus on the aspects of leadership, support and encouragement to teachers and students in overcoming problems, improving and enhancing the process of teaching and learning in schools.

INSTRUCTIONAL LEADERSHIP CONCEPT FRAMEWORK

The study adopts the instructional leadership model of Hallinger and Murphy (1985) as its conceptual framework. The model consists of three main, which are defining the missions and goals; managing programs and curriculum; and nurturing a conducive environment for teaching and learning. The three dimension can be further explained in ten sub-dimensions that are the dimensions of the designing of goals; clarifying goals; supervising teaching processes; managing the curriculum; monitoring academic progress, being in control during teaching, providing support for teaching activities, providing incentives to teachers, acculturation of the growth of knowledge, setting and enforcing academic policies, and rewarding students achievement.

INNOVATIVE LEADERSHIP

Innovative leadership definitions generally revolve around the person's ability to think innovatively; be creative, fulfill commitments, continue to improve the processes, products and services (Manz and Sims, 1997; Walton, 1985; Dougherty and Hardy, 1996; Plsek, 1997; Bossink, 2004; Aragon-Correa et al., 2007; Kamaruzaman Jusoff (2007). The definition of leadership also revolves around the ability of the leaders to influence (inspire, motivate, collaborate and align) followers to act together to generate the innovation needed (Sillince, 1994; Eisenbach et al., 1999; Tosti and Jackson, 2003; Bono and Judge 2004; Harvey, 2006; Aragon-Correa et al., 2007).

By definition, innovative leadership as someone who has skilled and creative followers in preparing products, processes or new services (Kamaruzaman Jusoff (2007). Indirectly, an innovative leader must also be creative, possess vision, imagination, and farsighted in producing thinkers among his followers (Carucci, 2007). Meanwhile, Gehler (2005) relates innovative leadership with the education of leadership training in a new strategic environment. It is an education where leaders are given the opportunity to develop their agility to face any challenges and complexity of the environment. Earlier, Jenson (2002) defines innovative leadership as the ability to be ahead in their advantages, such as the advantage of being in receipt of a strategic innovation in an uncertain environment.

INNOVATIVE CONCEPT OF LEADERSHIP FRAMEWORK

This study describes an innovative leader as a person who leads the creation and implementation of the innovation process. Therefore, the study defines innovative leadership as the process of intellectually stimulating, motivating through inspiration and

coordinating followers (subordinates) to achieve a common goal. (Mohd Asyikin, 2011).

SCENARIO OF INSTRUCTIONAL LEADERSHIP IN MALAYSIA

The Malaysia Education Blueprint (PPPM) 2013-2015 aims to produce management and principal of efficient and quality. To realize this goal, PPPM 2013-2025 pays attention to the duties and responsibilities of school leaders in planning, coordinating and evaluating instructional activities in order to improve performance and achieve its innovative and highly skilled human capital development. Thus, the principal is suggested to make changes and improvements in his instructional leadership and learning practices. This is consistent with the statement made by Shahril (2001), that the mere role of the principal as a school administrator is no longer appropriate to achieve the educational goals of Vision 2020 and to meet the demands of changes in the education sector. However, the reality is that school leaders are still unable to serve as instructional leaders in total because many teachers are still using traditional teaching methods and have failed in diversifying their teaching methods.

In addition, Andi's study (2007) shows that the control and protection functions of principals' teaching period were at a moderate level. This means that instructional leadership that needs to be practiced by the principal is not fully practiced. In fact, some principals did not serve as instructional leaders in full.

According to Mohd Suhaimi (2007) study which was conducted in low-performing schools, he is able to summerised that principals failed to prepare appropriate and effective teaching and learning programs due to teachers' lack of understanding in providing information on headcount. This failure is related to the weakness of

principals' instructional leadership role in ensuring that teachers are given sufficient knowledge to implement an improvement program in order to achieve the set objectives. In fact, Ashley (2010) explains that although school leaders need to practice instructional leadership, his behavior on the monitoring of student progress is weak because school leaders are more inclined and comfortable with the transformational and transactional leadership behavior.

In reality, the situation in school today requires the leader to spend his time mostly on office administration, discipline problems, paperwork, communication via phone or internet, which are not directly related to teaching (Azlin Norhaini, 2006). A majority of the school leaders also have failed to fulfill their primary role that is to help the teacher in the classroom due to their time spent on general school administration and management matters (Maimunah, 2005). In addition, many school leaders had to attend to many pressing matters, such as attending meetings, meeting parents and examining damages in the school. These matters have limited their time to focus on instructional leadership practices (Mohd Suhaimi and ZaidatolAkmaliah, 2007). School leaders also had to spend a lot of time in outside school tasks (Bity Salwana, Ahmad Basri, Ramlee and Mohammed Sani, 2008).

In realizing the objectives of the PPPM, it has been suggested that schools need to be competitive in order to make Malaysia a world-class education system. In this case, knowledge is the most important resource for creating change. Thus, organizations led by good leaders in using and managing knowledge, would achieve a better performance. School leaders are expected to have relevant knowledge, skills and expertise to manage schools towards excellence (PPPM, 2013-2025). In reality, knowledge plays an important role in realizing the transformation of educational excellence. Nonaka (1994) describes that not only the knowledge possessed by individuals, but also the group's knowledge in an organization can become a new knowledge to produce innovation in the

organization.

Coherently, the above findings concurs with Murray's (2013) findings that school leaders and teachers lack the knowledge and skills to use existing data to improve teaching, learning and school management. This weakness has led to the excess of available data that has not been used effectively for the achievement of students in the curriculum, teacher development, the provision of financial and human resources.

Based on the preliminary PPPM report, there is a relationship between the practices of high-performing school management and vice versa. Low performing school leaders claimed that they had a lot of programs that should be implemented and were burdened with this situation. On the other hand, high-performing schools, school leaders understood the important things that need to be done and acted by focusing only on the key practices that need to be implemented immediately. This situation illustrates that the knowledge of instructional leadership practices among school leaders are still at a moderate level and should be upgraded.

Significantly, educational organizations such as school can never achieve excellence in education without being led by a leader with skills to respond creatively and innovatively in any changing situations. According to Alimuddin, (2010) a stable leader is a leader who practises instructional leadership and become agents of change in schools since both elements can help to achieve school excellence. A study by Hazura Wan Hussain (2009) shows that there is a relationship between the leadership of principal as an instructional leader has a great impact on student academic achievement. This finding is consistent with the opinion of Hallinger and Heck (2003) in which the principal requires the commitment and cooperation of teachers to ensure improvement in student achievement. Fullan (2001), Bovalino (2007) and Havlik (2007) also agree that the success of change and innovation is made possible when the school leaders were given full cooperation and commitment by all teachers. Thus, it is the obligation of the

principal to implement any changes that occur, and according to Hussein, (2008) the success or failure of any change made depends on the principal. This finding is supported by Azhari (2002), who describes the principals as proxies of change at the school level who are accountable to support, help, guide and encourage teachers to adopt and implement change and educational innovation in schools effectively so that the school goals can be achieved, which particularly would benefit the students.

Undeniably, School is a social institution that delivers educational services to clients ranging from students, parents and the community. It is an undeniable fact that parents expect the very best for their children (Abdul Razak, 2001). In the era of globalization, technological development is moving rapidly. Al Ramaiah (1999) points out that the role of technology in schools is very important. The failure of the school to grow in line with the advancement of technology will hinder educational excellence. The use of modern tools in schools such as computers, machinery and equipment as well as new techniques in administration, teaching and learning will help to improve school performance. Recent development in the world of education that emphasizes on the use of multimedia, such as in the smart school has insisted that necessary changes in technology are implemented in school. To implement this change of course requires school leaders who have the knowledge, skills and great expertise.

Finally, Beer and Nohria (2000) revealed that 70 per cent change in organizations failed because of weaknesses in the strategy and goals, shortcomings in communication and trust, the weakness in the efficient management, change management skills, and weaknesses and obstacles in making changes. In fact, according to Hazura Wan Hussain (2009), the ability of principal behavior to manage internal and external challenges can ensure the success of a change in school. Thus, the principal as an agent of change should have a positive opinion about the changes, and excellent school leaders always know what is best, are sensitive to

change and the issues that plagued the education system (Nor Asikin, 2009).

CONCLUDING THOUGHTS

School leaders need to be wise in handling any uncertainties and in using available resources to make the right decision. When making a decision, the risks are not only borne by the principal, but the whole school community will also not be spared of the consequences (Hamedah and Normah, 2010). To manage these challenges, the principal should be innovative, creative and responsive to the various conflicts that arise during the running of the schools. This is evidenced based on a study by Mehrabani and Shajari (2012), where their study has found that the capability of the leaders in using their knowledge can produce innovation capability in an organization.

A leader needs to practice certain methods to remain competitive. Hitt et al. (2003) state that innovation is a strategic choice that allows a competitive advantage globally. Therefore, to remain competitive and to keep up with the changes, school leaders need to be creative and innovative. Leadership in schools should strive to continuously produce a skilled workforce, professional, creative and innovative (Hussein, 1993). Innovative leadership is a viable alternative to contemporary leadership in resolving problems effectively. Innovative leadership practices include radical changes through new ideas, methods, processes and techniques to solve any current and future problems (Asim Sen and Erol Eren, 2012).

Asim Sen study demonstrates that the innovative leadership is the most ideal leadership to be implemented in the 21st century. The literature also found that so far, there has been no study linking the instructional leadership practices with innovative leadership. Therefore, a comprehensive study regarding instructional leadership and innovative leadership is needed. In the innovative context, cooperation in generating innovative ideas and

support are greatly needed. There are some individuals who pose a threat to innovation. Uncertainty and lack of knowledge has led them to oppose to any innovation. This is because they view that any changes will replace what they already knew. These individuals believe that innovation will not bring any benefits to the organization but may cause a decline in quality and is a waste of money, time and energy.

A study on innovative instructional leadership practices needs to be carried out because not many previous studies have been conducted primarily involving the principal. For schools to remain competitive in the world arena of education, school leaders need to have the knowledge, skills and experience. These aspects will assist school leaders to meet any changes. This statement is supported by the findings of a study done by Popadiuk and Choo (2006) who found that innovation and knowledge creation has a strong and complex though limited studies in this area have been conducted.

In fact, Mohd Salleh (2000) states that the principal is considered as the person who leads instructional leadership tasks although their tasks are not much focused on the aspects of teaching. However, they are responsible in determining the level and progress of student achievement. Thus, a form of leadership that is able to fulfill this quality needs to be used and expanded mainly to the school leaders and headmasters as the front line leaders, and teachers as classroom leaders. The discussed instructional leadership will encourage teachers and the community to contribute ideas in the process of formulating the school vision, i.e. innovative instructional leadership.

A good innovative instructional leaders can foster shared leadership and implement effective change processes through improved teaching and learning, and promote effective relationships between the school and the community. Therefore a proper research on innovative instructional leadership practices need to be done. This statement is supported by Tamgorien and Kursunologlu (2009) who found that many school leaders took an indifferent attitude towards changes although this would hinder

schools from continuing to excel.

The Ministry of Education (MOE) in Malaysia (2010) has stated that the programs on developing school performance have to be created to help improve poor performing schools. Hence, a study to look at innovative instructional leadership practices is essential in order to generate new ideas and creativity for making change. So this study tries to review leadership practices amongst school leaders in order to realize successful change and innovation in schools.

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THE INFLUENCE OF INTERNATIONAL STUDENT MOBILITY PROGRAM TOWARDS DEVELOPMENT OF STUDENT'S GENERIC SKILLS

Siti Rahimah Mohd Yusop & Mahani Mokhtar

ABSTRACT

This paper reviews the influence of international student mobility program towards the development of students' generic skills which includes Communication Skills, Critical Thinking & Problem Solving Skills, Teamworking Skills, Information Management & Lifelong Learning Skills, Entrepreneurship Skills, Leadership Skills and Proactiveness Ethics & Integrity. This paper concludes by citing the previous research on impact of student mobility and based on review of development theory.

Keywords: International student mobility, Generic Skills

1.1 INTRODUCTION

Malaysia nowadays through The National Higher Education Strategic Plan (PSPTN) has focus at comprehensive internationalization efforts in the making of Malaysia as a regional hub. This strategic plan emphasis on enrolment of international students in higher education in Malaysia and Malaysia targets to has 200,000 international students by 2020.

Hao Wei (2012) stated that the volume of merchandise trades between countries will facilitates international student mobility across border. The students from developing country will

evaluate economic and educational situation in developing country to determine as their potential destination to study. But only economic factor will take into account when choosing destination in developed country. But, it is different for style of choosing among international students from developed country. They always take consideration on value educational factors for developed countries as possible destinations, while equally weigh educational and economic factors for developing countries as possible destinations. Thus, Malaysia should pay more attention on matters above to attract international students to study in this country.

The Ministry of Education (former as Ministry of Higher Education Malaysia) also put international student mobility as the main indicator for the internationalization of higher education. It has significant economic and academic implications, and is expected to grow considerably during the coming years (Ministry of Higher Education, 2011). This 'welcoming' agenda may help attracting talent from other countries to further their study or working in local companies after finishing short-term mobility program in this country.

Marianne D. Sison and Linda Brennan (2012) also mentioned that in the longer term, student mobility has led to improvements in international trade opportunities, networks and relationships for the host and home countries. Students develop lasting networks and friendships in their host countries. They also develop a tolerance and understanding of the cultural mores of their host country. These combine to produce 'global citizens' capable of taking their place in a variety of cultural contexts, not just those with which they are experienced. From above statement, we know that students are able to be an ambassador of their own country and create a networking at their level of community. So, it is a never waster investment when we are sending abroad as long as they are able to adapt with other cultures and appreciate their own culture.

Universiti Teknologi Malaysia (UTM) is very committed in supporting the National Higher Education Strategic Plan (PSPTN) which is to host international students in this country for study and

introducing the *internationalization at home agenda* to create a supportive environment to international students. In year of 2013, UTM has 5,043 international students at both campuses; Johor Bahru and Kuala Lumpur (Zaini, 2013). In other hand, UTM also introduced an international student mobility program to give benefits for international students from international institutions to study at UTM for a short term and also to local students for experiencing study at university abroad. In my opinion, local students must take this opportunity because Malaysia has a good relation with other countries and a good reputation as developing country, so there might be no difficulty or harmful for Malaysia students to study abroad.

1.2 INTERNATIONAL STUDENT MOBILITY PROGRAM

International student mobility program is a program which allow students to go overseas for the purpose of study in a long term or for a short term. It involves two ways of student mobility program which are ‘outbound program’ and ‘inbound program’. Outbound program means that students traveling abroad to other countries while inbound program applied to students who are coming from other countries. The aim of international student mobility program is to enhance education quality and diversity, which as so necessary in view of the harmonization process.

International student mobility program which commonly practiced in European countries become popular in this country since decade ago. Nowadays, lots of higher educations in Malaysia offer this program to their students. UTM offers international student mobility program to foster internationalization and create partnerships with overseas universities and education providers (UTM Office of International Affairs, 2009)

The students are encouraged to participate in student mobility program at least once throughout their study in the university. International student mobility programs content academic activities as well as cultural and social activities during

their stay abroad for minimum seven (7) days to one year with or without credit transfer. Best reasons to persuade or encourage students' participation are- by joining this program, students can experience their personal growth especially in communication skills, maturity and independent. Besides it can globalize students' academic experience.

Theresa Kuhn (2012) done a study in 2012 on 'why educational exchange programs miss their mark: cross-border mobility, education and European identity'. This study aimed at solving arguing that the international exchange programs in higher education are 'preaching to the converted'. Finding showed that participating in Erasmus exchange program does not strengthen European identity among students because students who are already very likely to feel European. This against some thought of scholars and policy-makers who put high hopes in the role of cross-border mobility and interactions as harbingers of a common identity among the European public.

On top of benefits to the students when joining international student mobility program, this program may create a mutual understanding between both home and host institutions. Learning best practices by one another will provide a great standard of procedure on settling guideline to international student mobility program. Besides, conducting and hosting international students may also enhance staffs' competencies especially in dealing with diversity of culture.

1.3 GENERIC SKILLS

UTM has developed a 'UTM Student Development Multidimensional Transformation Model'. Each component in the model explains that each department in UTM provides services and activities which lead to development of student's academic achievement, social and personal as well as career development. It is also an integrated and consistence effort to produce a quality and balance student in term of physical, emotion, soul, intellectual and

social (JERIS). As a result, UTM will produce holistic graduates who can contribute to development and sustainable for the nation and international. (Mohd Tajudin Ninggal, 2010).

Apart of UTM Student Development Multidimensional Transformation Model, UTM is also introduced “Generic Skills & UTM’s Students Attribute”. Generic skills are the general skills, knowledge, abilities and traits that students should possess to succeed in study and career. It is also known as ‘core skills’ and ‘employability skills’. Some skills enable someone to function effectively especially in critical thinking and problem solving. There are seven (7) generic skills used in UTM which are Communication Skills, Critical Thinking & Problem Solving Skills, Teamworking Skills, Information Management & Lifelong Learning Skills, Entrepreneurship Skills, Leadership Skills and Proactiveness Ethics & Integrity.

By developing student development model and these generic skills, it shows that UTM is committed to graduating competent and versatile graduates with a high moral and ethical value to serve for the God and mankind. Hence, there must be an appropriate development program to support and help contributing development of students’ generic skills. A quick review to UTM’s tagline is innovative-entrepreneurial-global has revealed that UTM a leading-research university in engineering put internationalization as a main agenda to compete with other top institutions in the world. With this international student mobility program should be the appropriate program for student development.

1.4 INFLUENCE OF INTERNATIONAL STUDENT MOBILITY PROGRAM

In my opinion, there is an influence from participation in international student mobility program towards development of generic skills among the students. According to the Human Capital Development Theory, human capital is a very important factor in

nation development in terms of economic and social. Besides, the success depends in large part on the people with higher level of competence. In response, the people are becoming valuable assets. In the economic perspective, the capital refers to factors of production used to create goods or services. The human is the subject to take charge of all economic activities such as production, consumption, and transaction. Thus, it can be recognized that human capital means one of production elements which can generate added-values through inputting it.

By reviewing explanation of this theory, we should agree that putting value to a human capital will benefits an organization and nation. Furthermore, by adding value to the human capital through development program helps producing a great human capital with required competencies, skills and knowledge, Therefore, international student mobility program can be a good program for a student development program so the students will be valuable to the country.

This idea is supported by a previous study by Russell King et. al (2010) has listed an issue that students and mobility managers believe that study abroad brings benefits to students on their languages, intercultural skills, flexibility of outlook and etc. Student mobility also can improve career prospects, but limitation of this study has identifies when concrete survey evidence is scarce. Evidence from employers is mostly anecdotal. Another research done by Dwyer & Peters (2014) shows that most of students who joined study abroad program for long term had a great improvement in their self development.

Talking about travelling abroad, there must be lots of challenges will be faced by students who travel. Each of the challenge, may lead them to polish their generic skills especially in communication skills. Communicating with other citizens is not only involves one way communication, but involves many skills of communication such as talking, listening, negotiating and presenting. With diverse style of communication in other countries will influence students' style of negotiating and encourgae them to apply a critical thinking skills when comes to solve a different

culture conflict.

Besides, enjoying a study abroad program encourage students to maintain their interest to continue learning independently in the acquisition of new knowledge and skills because world itself is like a book. Someone who travels or lives at one place, only reads one chapter. There are lots of thing to explore and participate in this program is a good way to train the students to be more confident when facing the real challenge after finish their study in UTM.

1.5 CONCLUSION

Undoubtedly, a traditional way to get a higher score in study must always be a concentration in the classroom besides lots of revisions. And it do helps to improve students' value. But, in the new era of internationalization, everything is challenging and competitve. Thus, they need value-added generic skills that go beyond disciplinary knowledge. Hence, the generic skills are needed because of they need to remain competitive, acquire new

Students should be able to prepare themselves with an outside classroom experience like international student mobility program so they can higher up their own generic skills with minor supervision by the teachers because they are using their own critical thinking abilities to solve problems. Otherwise, sitting in the same classroom will not get any value added to compare with other graduates.

Student mobility program is an appropriate developing program to achieve it because it is a mixture of formal and informal learning process and experience to the students. Participation of the students outside the classroom and exploring the world with their own perspective allow them to polish their skills especially the in communication and critical thinking.

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CRITICAL THINKING SKILLS IN EARLY YEARS

Wong Li Jean, Yeo Kee Jiar

ABSTRACT

Critical thinking skills are skills that children and adults need to learn to be able to solve problems. The core of teaching thinking skills to children is to enhance their curiosity, enables them to reason better, and helps them to be responsive to information and not just acknowledging it. The current preliminary study aimed to identify critical and creative thinking among kindergarten children. An interview which involved three teachers and a principal was conducted in a kindergarten to obtain opinions on critical thinking in the current curriculum. Findings from interview revealed that teachers are not equipped with the knowledge and skills on teaching and learning critical thinking skills among kindergarteners. In addition, the insufficient resources to support instructional further impede the teaching of critical thinking skills to the children. The result of this study provides some basic information regarding young children's capacity and skills to think critically and creatively.

Keywords: critical and creative thinking, kindergarten, early childhood

1.0 INTRODUCTION

Today's improving conditions of education highlight the need to reinforce children's thinking in the curriculum. Children are

competent to adapt some of the initial thinking concept and skills. The skill of critical thinking, which is momentous for both community and the individual, takes its place in the skills tried to be gained lies at the heart of education. Sharpening and refining of the thinking process should be the primary goal of learning and teaching in education (Wong & Yeo, 2014). Moreover, critical and creative should be taught during school years and students are expected to be trained as independent thinkers, effective thinking (Zahra, Yusoff & Hasim, 2012). Therefore, activities in school should be able to fulfill children's cognitive needs for critical and creative thinking (Smildtstein, 2011). Every child should be able to master a range of important cognitive skills; however, this is an area where the system has fallen short (Malaysia Education Blueprint) .

2.0 LITERATURE REVIEW

2.1 CRITICAL THINKING

Critical thinking is an intellectual and skill gain through a persistent effort of knowledge, quality and depth of experience in sphere of thinking. Teaching thinking stimulates and challenges a child intellectual. Students are motivated and more engaged in the classroom when teachers stimulate their intellectual and thinking (Fisher, 2008). Therefore, critical thinking skills can be capitalized by educators in the classroom to stimulate their intellectual skills through reading and writing in the school.

Students faced with a future in an unpredictable world and in the new digital age will need to gain the skills to reason, making decision and solve problem in their lives and learning. It is important to have right learning environment fostering critical thinking for young children (Wong & Yeo, 2014). Therefore, school should be a place that provides rich intellectual resources to help students to become a better thinker. However, common practices of transferring knowledge such as endless worksheet,

passing tests and focusing on textbooks scripts in traditional classroom settings are still happening in the school (Smilkstein, 2011).

Although there is a growing awareness of the importance of developing children's thinking skills within the preschool curriculum, preschool curriculum in Malaysia are still accustomed to be educated in formal way in which academic and formal curriculum is highly emphasized (Bakar, 2010). In recent years however, the early childhood landscape has seen perceptible changes of embarking on more progressive approaches. To spur transformation of education system, Malaysia Ministry of Education with Agensi Inovasi Malaysia (AIM) started i-Think project to impart thinking skills to students, allowing them to be problem solver, lifelong learners, and creative thinker. Additionally, Malaysia Preschool Curriculum Standard Document (2010) aims to integrate creative, critical and innovative thinking in all teaching resources and learning environment. The initiatives provided the basis of positive learning environment that children should be exposed to the development of key skills such as critical thinking in the schools (Preschool Curriculum Standard Document, 2010).

2.2 CRITICAL THINKING SKILLS IN KINDERGARTEN

Early childhood education practices should infuse the elements of critical and creative thinking skills in the curriculum (Lin, 2011; Adam, 2013). The relationship between creativity with pedagogical practices and the categories of creativity nurtured within education are based on a creative pedagogical framework which consists of creative teaching, teaching for creativity and creative learning. (Lin, 2011). Therefore, teachers' practices and experiences with critical thinking are important to implement these thinking skills in the school.

Educator with the critical thinking skill applies it to his or

her own life, can be more effective in learning environment based on creative thinking (Tok, 2012). Moreover, the educator ought to be a model for the students about their thinking skills. Sternberg (2003) emphasize that for an educator it is significant to be a model for the students to develop their thinking skills. In conjunction with that, teachers' personal conviction was found affected their choices of classroom management approaches (Eveyik-Aydin, Kurt & Mede, 2009). Therefore, teachers are able to produce the greatest learning gains in thinking, if they believe that students are capable to think.

A study was conducted by Cheung & Leung (2014), teachers' personalities are able to bring a great impact on children's learning and classroom practices. Hence, teacher's belief and self-efficacy in their teaching are strongly influenced students' achievement and skills (Jenkins, 2013). Teachers can enhance student learning in powerful ways that extend beyond memorization and tests by helping students learn and apply the attitudes and practical tools of effective problem solvers. On the other hand, creative thinking refers to creation of new ideas which eventually important to solve problem. Teacher as a model of problem solver is to be emulated by the children in the classroom. Teachers are encouraged to involve students to attain challenges of problem solving and help them to progress gradually become independent thinker and problem solvers instead of memorization-dependent (Hamza & Kimberly, 2006).

Teacher-centered and student-centered approaches mainly used as teaching approach around the world. Strategies to practice critical and creative thinking skills in the classroom are those that involve student-centered activities, the use of multimedia technology, the connection of content to real-life experience and questioning skills are the effective instructional strategies (Hornig, Hong, Chan Lin, Chang, and Chu, 2005). Furthermore, educators should understand the readiness of the students to enable the success of teaching-learning activities by promoting collective working and collaboration among students with similar interests and skills (Kayikci, 2009). Although teacher is mainly responsible

in the learning environment however it is important for the students ready to play an active role in their learning by virtue of their participation and activities (Azizah, Fariza & Hazita, 2005).

Development of young children's thinking and problem solving skills is an alternative approach in the curriculum, instead of, only applying good teaching (Taggart, Ridley, Rudd and Benefield, 2005). Children need to be opportunities with reading materials helping them to question and think or to be creative in the school (Rosnani & Suhailah, 2003). A study has shown positive relationship between critical thinking, creative thinking and the study of mathematics (Aisikovitsh-Udi and Amit, 2011). Hence, thinking skills can be infused across the curriculum by systematically identifying opportunities within the normal curriculum for thinking skills development.

Supportive environments in an educational setting were found significant impact in fostering children's creative thinking skills (Lin, 2011). Supportive environment includes leader, administration and parents. School administrative and authority must establish the atmosphere for educators to do creative work, in order to promote creativity among learners (Adam, 2013). Creative leaders are the key person to create the critical and creative thinking environment and opportunities for children (Temperley and Stoll, 2009). Therefore, the school principal or administrative leader should be at the front line to develop a new paradigm in the school system (Rosnani & Suhailah, 2003). Recent literature shows that classroom instruction and student achievement increases when schools provide structured opportunities for teachers to collaborate and learn new skills (Gallimore, Ermeling, Saunders, & Goldenberg, 2010). On the contrary, parental involvement is critical to a child success in school in term of academic performance, learning behaviour, self-concept, test scores, attendances and aspiration (Lynch, 2005). On that account, parental involvement was found statistically significant correlations with children' performance in the classroom includes critical and creative thinking (O'Donnell, 2011).

Nowadays, learning environment should support and

challenge the learner's thinking. However, the issue of fostering thinking skills in learning environments remains problematic. Learning activities that foster higher order thinking skills such as creativity will be eliminated if teachers continue with conventional approach such as memorizing materials and focusing on the examination rather than the brain compatible strategies (Rosnani & Suhailah, 2003; Adam, 2013). There are significant effects on teaching method and teachers' behaviour in increasing creativity among school students (Zahrin, 2003 & Joseph, 2009). In addition to that, research has discovered the educators' lack of belief and knowledge in creative and critical thinking (Rosnani & Suhailah, 2003; Smilkstein, 2011). According to the report by Tan Sri Muhyiddin Yassin, the Deputy Prime Minister recently stated that only 3% pre-school teachers possess the formal qualifications and mostly are only on-the-job training or took pre-school education courses not recognised by the Malaysian Qualifications Agency. Consequently, educators are unable to execute thinking skills in the classroom without appropriate skills.

In order to gain better understanding on the integration and incorporation of creative and critical thinking in daily lessons, the proposed study was conducted to investigate the limitation of developing critical and creative thinking among kindergarteners. Hence, this study aims to discover the teachers' experiences and practices of creative teaching and critical thinking among kindergarten children. Besides, the management and administrative personnel are also considered in the study of how to improve the teaching of critical and thinking in the school.

This preliminary study aims to identify the teachers' opinions towards critical thinking among the kindergarten children. The main purpose of this study is to investigate the kindergarten teachers' teaching practices on critical and creative thinking skills.

2.3 PURPOSE OF STUDY

The purpose of this study is to identify teachers' view about the critical thinking in the kindergarten. In accordance with this purpose some answers were looked for the questions below.

1. What are the opinions of the kindergarten teachers about their own practices and experiences towards critical thinking?
2. What are the opinions of the kindergarten teachers about the classroom approach towards critical thinking?
3. What are the opinions of the kindergarten teachers about the school environment support towards critical thinking?
4. What are the evidences of critical thinking practices conducted in the classroom?

3.0 METHOD

Qualitative methods through observations and interviews were used as data acquisition approach. Observation and interview were employed to collect and analyse the critical and creative thinking skills practice in a kindergarten.

3.1 PARTICIPANTS

One principal and three teachers were employed as the interviewees for the study. Principal and teachers were interviewed individually to identify the current practices of critical and creative thinking skills in the kindergarten. Besides, observation was done to identify the strategies and practices in the classroom. Observation includes four level classes consists of 3 – 6 years old.

3.2 DATA COLLECTION

Semi-structured interviews and classroom observations were used for data collection.

3.2.1 Interview

The main method use in the data collection is in-depth face-to-face semi structured interviews with teachers and principal. Each participant was expected to respond verbally to the proposed 19 open-ended interview questions. MaxQDA analysis tools were utilized to categorize the information according to the research questions. The main ideas in each category were coded, and the themes were identified. Subthemes were then developed from the main ideas and themes were recognized from the subthemes. Analysis of the interview transcripts were revealed in three main themes according to the participants' opinions, there are: practices and experiences, classroom practices, and school environment supports.

3.2.2 Observation

The second method used in collecting the data is the small scale structured observation. The use of small scale observation with intends to observe on how critical thinking skill was implemented in classroom practice. The observations were used to observe teachers in terms of learning activities and overall teaching learning approaches in the pre-school classrooms. The observation method was based on the scale of *0 - No evidence; 1 - Very little evidence; 2 - Some evidence; 3 - Much evidence and 4 - Considerable evidence..*

4.0 RESULTS AND FINDINGS

There were 3 teachers and one principal were interviewed in this study. The data gained in the study are according to the research problem. The researcher analysed the responses given then categorized them into three major themes and sub-themes as follows:

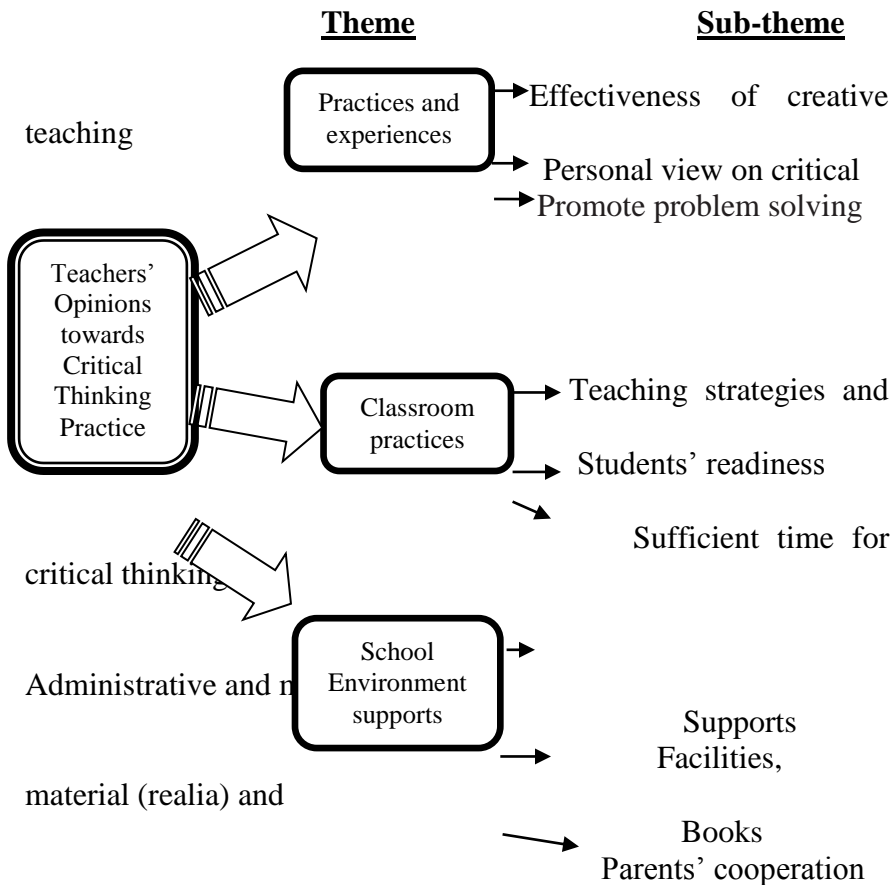


Figure 1 : Themes and sub-theme of teachers' interview

4.1 INTERVIEWS OF KINDERGARTEN TEACHERS

4.1.1 The Opinions of teachers' practices and experiences on critical thinking

Teachers commented that creativity was an important element to enhance learning among kindergarteners. Most of the teachers are incapable to define and differentiate the meaning of critical and creative thinking skills. Teachers with 10 years teaching experiences commented that "I am not sure about the definition of critical thinking". Principal commented that most of the teachers do not have early childhood knowledge background and lack of training. Generally, teachers gained experience through on the job training. Besides, quarterly in house training was provided by internal senior teachers. Critical and creative thinking were applied by some teachers in the lesson, however, they are not aware with the teaching terminology involved. This phenomenon strongly shows that teachers are lack of formal knowledge in applying creative and critical thinking in their teaching. This is what the principal said "Some teachers know the term, but do not know how to apply it, and some teachers applied it without knowing the term of creative and critical thinking skill".

Most of the teachers emphasized creative skill such as art and craft strategies are the preferred method used by teachers to enhance learning skills, as well as to generate motor skills among the children. Hence, the critical thinking approaches were neglected by the teachers. Additionally, the principal commented "Teachers themselves are without critical thinking skills, thus unable to produce critical thinking students".

4.1.2 The Opinions of teachers' classroom practices on critical thinking

Strategies and teaching approach is the highest frequency commented by participants. This approach includes supported

materials, group work or project, computer aided teaching (CAT) and activities actively involved by students. Teachers commented that the supported materials and resources are important to improve the students' learning. Technology was widely used to enhance learning in the classroom. Therefore, teachers prefer using CAT such as songs, story and games were frequently used in the classroom to enhance students' learning. Teachers had stated that the interactive pictures and song in the CAT are able to attract students' attention if compared to regular workbook. In activities wise, students are actively involved in gardening, cooking, singing, dancing, playing games, storytelling and drawing.

Student academic readiness enhances *both* student achievement and student attitudes about learning. Teachers commented that some children are fast learner and able to work independently, while some are weak and may not ready for learning. Family background, language proficiency and ability in learning can be a hindrance for some children were unable to follow the instruction in the classroom. Hence, teachers should understand each student's readiness in order to deliver knowledge to them accordingly. Time constraints posed a big challenge to teachers and students. Teachers are unable to produce effective teaching on critical and creative thinking in a short time. Most teachers followed the classroom schedule fixed by the school management without much personal inputs.

4.1.3 The Opinions of teachers' towards school environment support on critical thinking

Parents' expectation and different views in education may affect teachers' performance. Comparisons were most likely made by parents on academic achievements among students and this narrow focus has become a twisted school culture. In fact, parents' personal judgement and question on teachers' performances has caused teachers unwilling to make new changes in teaching.

School authority always supports teachers to develop

creative and critical thinking skill through motivation, supporting material and school activities program. However, the material resources and facilities are limited in order to support creative and critical thinking skill efficiently. Hence, trainings are important component for teachers to develop creative and critical teaching methods, but the current practices and in-house training in the school are not sufficient to enhance teachers' knowledge of creative and critical thinking skills. Engagement of professional trainers to train their teaching staff could be an important option.

4.2 CRITICAL AND CREATIVE THINKING SKILLS PRACTICE IN A KINDERGARTEN THROUGH OBSERVATION

Observation in the classroom was done to examine the application of critical thinking skills in teaching and learning. A checklist was used to record the practice. The response recorded was analysed by using observation checklist by researcher.

There are two categories observe by researcher in the classroom which are activities provided by teachers and instructional strategies, media and realize that foster thinking among the kindergarteners. Only one observation found much evidence of thinking skills in classroom practices fall in first observation of 5 years old students. In this observation, researcher found that teacher is able to provide opportunities for students to ask questions. Students are excited during the question and answer session. On the other hand, most observation found only some and very little observation of thinking skills being practice in the classroom with minimum.

Therefore, there are minimum practices of thinking skill being found in the classroom. Students are unable to learn and practice with less opportunity to expose to critical and creative thinking skills environment. Thinking skills are unable to be taught once (Aizikovitsh-Udi and Amit, 2011; H.N, 2014) but should be embedded in an on-going process of learning. In order to maximize

the opportunities for student thinking, classroom approaches including resources and techniques are helpful in developing thinking skills (Taggart *et al.*, 2005).

5.0 DISCUSSION

The purpose of this study is to identify the teaching and learning of critical thinking in the kindergarten. Overall, creative and critical thinking skills were seldom applied in the daily lessons. There are a number of negative responses regarding on the definition and experiences towards critical and creative thinking skills. Teachers are unable to differentiate the meaning of critical and creative thinking skills. However, teachers have mentioned a number of creative teaching methods such as art and craft making, real material or pictures presenting, singing and dancing. Due to the limitation of thinking skills, teachers may not be able to educate the children effectively. In order to become a model for the students (Tok, 2012), an educator is encouraged to possess good thinking skills to help students in applying the same on daily lessons. One research done by Nicholas Zill (2007), stated that teachers' quality with certain degree of early childhood background have positive correlation classroom quality and child outcomes. Therefore, teachers need to obtain certain degree in early childhood education.

Students were not educated effectively on critical thinking, problem solving and decision making. Teachers were more inclined to provide information and knowledge to students directly, instead of letting them to think critically and creatively. Students' discipline, learning attitudes and behaviours also affect the learning ability in the classroom. According to Cheung & Leung (2014), traditional Chinese cultural values also appeared in "Discipline" dimension that caused teachers a dilemma in choosing between creativity and traditional education.

The proposed observation checklist chart was focused and

examined the qualitative data of the classroom setting, strategies and teaching practices of creative and critical thinking skills in the lesson. Teachers are making an agreement that creative and critical thinking skills are fostered significantly in the classroom.

In order to foster creative and critical thinking among children, parents, school management teams and the appropriate facilities provided are playing the important role. However, most parents concerned more about academic achievements rather than the implementation of thinking skills of students. In addition, main concerns such as the students' abilities to cope with the syllabus, examination scores and the chance to pick the famous schools for their children become the norm for most of the parents. Due to Malaysia's education culture that focused on academic achievements for long, motivation and initiative from management team is important to support the teachers, especially those who are lacking of adequate knowledge, experiences or abilities on thinking skills.

This study serves to alert kindergarten and related practitioners to the need for more teacher self-evaluation and curriculum scrutiny, if children are to be adequately supported in their early critical thinking skills.

6.0 CONCLUSION

This preliminary investigation into aspects of kindergarten children's critical thinking in learning and teaching, as one feature of adjustment to the demands of primary school, has served to highlight some parameters for further investigation. Several factors emerged from this study's interviews and classroom observations of students and teacher at a kindergarten that contributed to a greater understanding of learner, teachers and the sphere of critical thinking. Constructions that emerged from this study show that thinking skills are not fully applied in the daily lessons. Teachers are not equipped with proper skills to improve the thinking skills among students. This study has been able to identify the current

practice limitations in the kindergarten and the importance of fostering thinking skills in the early years of learning. Educators should be well-trained in order to integrate effective thinking skills into their teaching practices (Burke & William, 2008). When thinking skills are taught in early years, young children are able to gain the abilities to think critically and creatively at present and their adulthood in the future. With the understanding that critical thinking is a desired result of education, we will need to find solutions to help students improve their skills to think critically and their nature to use these skills. The larger study will therefore include a consideration of alternative teaching approaches and materials, and attention to the differences in how children being enforced in critical thinking.

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THE PEDAGOGY OF TECHNOLOGY INTEGRATION IN TEACHING AND LEARNING

Ngau Chai Hong & Jamalludin B. Harun

ABSTRAK

Pedagogy is a part of education in the teacher education's curriculum, which is very important to be studied and learned by the trainee teachers who are pursuing education in educational institutions. Mastery of teaching skills is an absolute condition to help teachers carry out their teaching activities effectively and professionally competent. A major challenge for the 21st century education is the capability and the willingness to create and use the innovative pedagogy with the appropriate technology to achieve the learning outcome among the educators. Thus, mastery of the pedagogy elements and integrating technology elements into the curriculum has been emphasized into the syllabus of the institute of teacher education in our country. However, we should note that the achievement of excellence that is expected among the younger generation in the future cannot solely rely on the skills and technology. Instead, the teachers have to play an important role not only to use their creativity in selecting, preparing, processing the existing methods, but also to design new approaches to suit the students in addition to using appropriate technology as a tool to assist in the success of the effectiveness of teaching and learning process in order to prepare our students be able to deal with globalization and the knowledge-based economy in the 21st century.

Keywords: pedagogy; technology; integration; teaching and learning.

1.0 INTRODUCTION

Education in the 21st century expects to produce generation with critical thinking, creative and innovative. Thus, institute of teacher education has been entrusted to produce human capital of teachers with good quality such as thoughtful, creative, innovative, equip with problem-solving ability and competitive. In addition, mastery of elements of the pedagogical via technology should be emphasis in the curriculum of teacher education. This can be evidenced by the statement of Silverman (2012); Solvie & Sungur (2012); Koehler & Mishra (2008), and Kinzer et al. (2006) testified that the pre-service teachers play an important role in developing and strengthening the scaffolding in teaching and learning (T&L) through the use of technology. In addition, the study of Romina et al. (2010) also highlighted that the technology enables the learning environment to be creative and innovative as the technology can act as a platform to enhance creative learning and innovative teaching in the T&L.

With systematical instructional planning and development of the new technology could make a great potential to transform the learning process. Instead, it could help the pedagogy more student-centered, promoting the collaborative learning, authentic, constructive, cooperative and active learning (Jonassen et al., 2003). Therefore use of the innovative pedagogy with enhancing of the appropriate technology in T&L plays a very important role to the achievement of learning outcomes.

2.0 DEFINITION OF PEDAGOGY

According to history, the word of 'pedagogy' is derived from the Greek word, 'pedagogue', which means a educator who has the talent and skills to perform their teaching effectively (Mok, 2008) whereas Debalina Barik and Manik Mondal (2012) define pedagogy as a term of instructing people or convey information

through the teaching activities to acquire knowledge and skill. The study of pedagogy is spacious, it covers all aspects of teaching T&L in the classroom, such as the approaches, methods, techniques and strategies for T&L, school organization and classroom management, curriculum and syllabus, learning and assessment, restoration and enhancement, and so on. The discussion on this paper is more focus on the approaches and strategies in T&L in institution of teacher education.

Due to the evolving knowledge of pedagogy from time to time, the concept of pedagogy is changing. Nowadays, with the increasing number of scientific studies on the design of teaching and learning theory based on the psychological development, as well as the educational objectives of the school curriculum, pedagogical concept is more accurately described as the science of teaching which involves the study of the principles and methods of T&L process based on educational research methods in order to achieve effective learning outcomes.

Pedagogy is a part of education in the teacher education's curriculum, which it very important to be studied and learned by the trainee teachers who are pursuing education in educational institutions. This is because through the course of the study of pedagogy, teacher trainees will be trained to master the skills and techniques based on the theory of teaching and learning in the classroom. Mastery of teaching skills is an absolute condition to help teachers carry out their teaching activities effectively and professionally competent. Hence, it is acknowledge that teacher education programs need dynamic development such as pedagogies and assessments need to change. With the new innovative educational system, would enable us to produce the quality of 21st century educators.

However there are issues arise to made most us to rethink is how is our pre-service teachers could foster an effective pedagogy in the T&L environment, which could achieve the learning outcomes in addition to not ignore the 21st century skills is supposed to be mastered by our students especially in this new millennium ? For that purpose, an instructional design that meets

the requirements of our curriculum should be implemented. To overcome these issues, many educators have been suggested to integrating appropriate technology in T&L. According to Unkefer et al. (2009), technology is a tool to support student learning and it could improving instruction. Below is a full description about technology.

3.0 CATEGORY OF TECHNOLOGY

According to Debalina Barik and Manik Mondal (2012), the word 'technology' also derived from Greek word 'technic', it means art or skill. Technology is often considered to be 'improving learning' and the term 'technology improves learning' more and more used in the United Kingdom, Europe and other countries in the world (Kirkwood et al., 2014; Guri-Rosenblit & Gros, 2011).

Information technology such as computers, software applications, video, audio, visual, multimedia and telecommunications can integrate virtually any situation in the classroom. The important thing is that we need to focus on the objectives and goals of the curriculum are to be achieved. In addition, we also need to identify the type of appropriate technology which will help in achieving the goal.

Generally, not all the technology suitable to support any strategy or a different approach in the classroom. According to an education research, Barbara Means (1994), which was introduced four categories of applications that can help to identify the type of equipment or technology in accordance with the strategy that we will use in the classroom to achieve various objectives related to curriculum that has been granted.

The first technology category introduced by Barbara Means (1994) is the information technology. According to her, information technology is the support material that can transmit information from the source to the students. Normally it delivers learning content based on predefined sequence (mutual learning includes expository information, demonstrations, exercises or drills

are delivered and controlled by the system). In addition, it is suitable for the development and strengthening of basic skills and also used to support skills such as spelling, grammar, vocabulary development, and basic mathematical functions.

The second category of technology is the technology of the application/use. It is used to assist in the tasks of learning and not as a mechanism for information dissemination L&T. This includes software, such as word processors, spreadsheet programs, databases, and other programs for data collection/analysis. For example, word processing software can be used at all grade levels and in all subjects. Use of the technology is temporary, or process, a step towards achieving the goal of instruction.

The third category of technology is technology that is a combination of exploratory learning content with specific delivery strategies to encourage students to explore the subject and construct their own knowledge. The majority of exploration technology applications is open and can produce a variety of narrative. The main goal when using the technology for exploration not get the right answer, but for the purpose of using technology to engage with the subject and get a sense of involvement. Exploration technology is often used to facilitate student collaboration, critical thinking and group problem solving.

The fourth category of technology is a telecommunications technology. In this context, the use of telecommunications technology is a technology to support teaching and learning process. Telecommunications technology can be used in any of three modes/categories discussed above (information, applications and exploration). Often, the technology used in the exploration mode to facilitate research collaboration and distance learning students. Examples of technologies for telecommunications are as follows:

- Learning Management Systems such as Moodle, WebCT, Blackboard.
- Development Website for the purpose of individuals to share information with students.
- Social Networks such as Face book, LinkedIn, Twitter, Research

Gate, Forum.

- Online publications such as Blogging, Podcasting, YouTube, Flickr, Wiki.
- Conference on Electronics, such as Yahoo Messenger, Skype, MSN Messenger, Google+.

Effectiveness of T&L mostly rely on strategies T&L adopted by teachers with integrating the appropriate technology such as technology applications, technology exploration, technology telecommunications, technology to provide information to students and the technology associated with the hardware and software in teaching process will be benefit student learning .

4.0 THE PEDAGOGY OF INTEGRATION TECHNOLOGY IN TEACHING AND LEARNING

Many researchers have shown that technology enhanced pedagogies impact student's experiences in learning environments. This supported by M.S. Ananth (2011); Pyryt (2009); Ng & Nicholas (2007) that challenges in the pedagogy and technology relevant with the development of online learning to fulfill needs of students with various backgrounds and expectations, and teachers will need to understand the paradigm shift of online learning than face to face education are enormous. The existence of the technology made learning is no longer a problem which we could have a new way of learning to communicate, interact and cooperate with our distant peers whom is not available in our learning communities. Wallace (2005) has outlined on two methods of online communication: synchronous interaction (video-conferencing, online chat sessions, and etc) and asynchronous interaction (e-mail, voicemail, online discussion forum, video mail, webcasting, podcasting).

Besides, technology has been used in many ways to enhance the quality of T&L, including providing tools for better assessment, more authentic inquiry, pedagogy become more efficient, better production equipment, and more powerful

performances tools. Various aspects of improving T&L through the use of technology have been explored in the research, including the enrichment of the curriculum, improved assessment, and teacher professional development facilitation (J. Chen et al., 2013). In order for teachers to be prepared and be willing to use the technology to support the development of generative pedagogical, structure of professional-development program for teachers is very important. A lot of research on teacher education has proposed an effective model of professional development, including active learning and collective participation (Desimone, 2009).

According to Gao et al. (2009) dan Zhao (2007), teachers should receive intensive training that focuses on the demonstration of technology integration strategies and the application of these strategies in the curriculum. In addition, this statement is also supported by Predmore (2005) that many teachers need adequate training and courses so that they can practice how to teach effectively. Therefore, teachers in general and the prospective teachers in particular should be given exposure guidelines on how to apply the strategy T&L creatively and with the steps correctly so that they are confident and be able to master the pedagogical skills to plan and implement strategies T&L to the process of teaching that is planned with systematically.

5.0 CONCLUSIONS

Integration of technology in pre-service teacher education emphasized important that prospective teachers have the technological skills to develop technology-based learning experience that is meaningful to their students in the future. However, with technological skills alone will not guarantee success, but researchers have successfully used design-based learning in their study. Therefore, one way to create an effective learning is the teacher education system should develop a model that has the relationship between learning with technology (Degennaro, D., 2010). For this to occur, pre-service teachers were

challenged to think and create a successful learning environment with T&L with technology, and to become designers of learning with digital media and network technologies (Lock, J., 2007).

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STRATEGI PEMBELAJARAN KOLABORATIF ATAS TALIAN UNTUK PENGGUNAAN FROG VLE

Rashimah Abu Kasim & Zaidatun Tasir

ABSTRAK

Perkembangan pesat bidang teknologi maklumat menjadi antara penyumbang terbesar kepada pembangunan negara kita Malaysia. Proses P&P juga tidak lagi terhad di dalam bilik darjah sahaja, malah pelajar boleh mengalami suasana menimba ilmu walau di mana pelajar itu berada. Sebagai alternatif bagi meningkatkan kefahaman pelajar di sekolah, Kementerian Pendidikan Malaysia (KPM) telah mewujudkan satu revolusi dalam P&P dengan memperkenalkan *Online Learning* atas Pembelajaran Atas Talian dengan menggunakan platform FROG *Virtual Learning Environment* (VLE) yang dijalankan oleh 1BestariNet. *Online Learning* ini dikatakan dapat memberikan pelbagai kelebihan kepada pelajar dan juga tenaga pengajar itu sendiri. Pelajar dapat menjimatkan tenaga teknikal dan boleh memperoleh seberapa banyak maklumat melaluinya. Keperluan untuk merancang kualiti P&P secara *Online Learning* adalah amat penting. Oleh itu guru-guru memerlukan satu garis panduan untuk menjalankan P&P melalui *Online Learning*. Rekabentuk pengajaran meliputi pembinaan bahan pengajaran, aktiviti, percubaan dan penilaian keseluruhan pengajaran dan aktiviti pelajar. Perlu ditegaskan juga bahawa rekabentuk dan pembinaan pengajaran dan pembelajaran mesti mengambil kira aspek pedagogi, teori pembelajaran, teori rekabentuk pengajaran dan model serta media dan teknologi yang akan digunakan. Oleh itu, strategi pembelajaran kolaboratif atas talian adalah dicadangkan

bagi penggunaan FROG VLE di sekolah. Rujukan yang digunakan adalah strategi *Online Collaborative Learning* (Linda, 2012) dan juga Oliver & Herrington (2003).

Keywords: Online Learning, Pembelajaran Kolaboratif Atas Talian

1.1 PENGENALAN

Perkembangan pesat bidang teknologi maklumat menjadi antara penyumbang terbesar kepada pembangunan negara kita Malaysia. Perkembangan positif ini bukan sahaja memberi impak positif kepada ekonomi negara, malah sektor pendidikan juga antara bidang yang menerima manfaat yang hebat hasil daripada perkembangan yang terjadi ini. Dalam proses pengajaran dan pembelajaran (P&P) di dalam kelas, teknologi maklumat banyak membantu terutama sebagai medium pengantara guru dan pelajar. Proses P&P juga tidak lagi terhad di dalam bilik darjah sahaja, malah pelajar boleh mengalami suasana menimba ilmu walau di mana pelajar itu berada. Proses P&P dapat dipertingkatkan mutunya dan dipelbagaikan penyampaian dan penerimaannya melalui beberapa teknik seperti berbantuan komputer dan perisian, melalui sistem rangkaian (networking), perisian dan pangkalan data atau maklumat atau melalui sistem internet, perisian dan pangkalan data. Penggunaan alat bantu mengajar ini dikatakan dapat meningkatkan minat serta merangsangkan minda pelajar di zaman siber ini dan telah dianggap dan diakui sebagai pemangkin proses pengajaran dan pembelajaran (Johari & Fazliana, 2011).

Oleh itu, Kementerian Pendidikan Malaysia (KPM) telah mewujudkan satu revolusi dalam P&P dengan memperkenalkan *Online Learning* atas Pembelajaran Atas Talian dengan menggunakan platform FROG *Virtual Learning Environment* (VLE) yang dijalankan oleh 1BestariNet. Visi 1BestariNet adalah mengubah platform pendidikan di Malaysia serta merapatkan jurang digital di antara murid kawasan bandar dan luar bandar

dengan menyediakan pendidikan berteras Internet yang berkualiti kepada semua rakyat Malaysia.

i bawah 1BestariNet, sekolah-sekolah akan dilengkapi dengan penyelesaian bersepadu yang membolehkan pengajaran, pembelajaran, kolaborasi dan pengurusan pentadbiran dijalankan di Internet menerusi Frog VLE, yang boleh diakses di sekolah atau dimana-mana sahaja yang mempunyai capaian Internet. Sekolah-sekolah dilengkapi dengan capaian Internet yang pantas, membolehkan akses ke VLE dapat berlaku tanpa masalah. Ini merupakan sumbangan progresif ke arah pendidikan berteras teknologi Internet untuk pengajaran dan pembelajaran berkesan serta memudahkan pengurusan pentadbiran sekolah.

Online Learning merupakan satu bentuk revolusi pendidikan yang berorientasikan sistem pembangunan web. Ianya semakin popular dan digunakan sebagai salah satu medium pengajaran dan pembelajaran masa kini bagi tujuan pendidikan formal di sekolah di bawah KPM. *Online Learning* dikatakan dapat memberikan pelbagai kelebihan kepada pelajar dan juga tenaga pengajar itu sendiri. Pelajar dapat menjimatkan tenaga teknikal dan boleh memperoleh seberapa banyak maklumat yang terdapat menerusi *Online Learning* ini. Perkembangan ini telah mewujudkan persekitaran pembelajaran yang lebih fleksibel dari segi masa, tempat, kaedah dan bahan pembelajaran di samping mewujudkan lebih peluang untuk proses kolaborasi yang lebih meluas dalam proses pendidikan (Kamarul Ariffin & Muliadi, 2007).

Inisiatif ini adalah selaras dengan Dasar Pendidikan Kebangsaan tentang Teknologi Maklumat dan Komunikasi (TMK) dalam Pendidikan adalah untuk melahirkan modal insan yang berkeupayaan, berinovasi dan meneroka bidang baru bagi menjana kekayaan negara dengan penglibatan dan kerjasama kelompok pakar, perkongsian dengan sektor awam-swasta serta penglibatan komuniti serta strategi perlaksanaanya dengan membangunkan dan memperluas bahan pengajaran dan pembelajaran dalam bentuk digital dan menggalakkan perkongsian kolaboratif kelompok pakar dalam pembangunan bahan sumber digital (Bahagian Perancangan

dan Penyelidikan Dasar Pendidikan, 2012)

1.2 LATAR BELAKANG MASALAH

Menurut Pelan Pembangunan Pendidikan (PPPM 2013-2025) dalam anjakan ketujuh iaitu memanfaatkan ICT bagi meningkatkan kualiti pembelajaran di Malaysia, penggunaan ICT di sekolah masih tidak mencapai tahap yang memuaskan, baik dari segi kualiti mahupun kuantiti. Sebagai contoh, kajian oleh Md. Nor Bakar & Rashita (2011) mendapati tahap pengintegrasian ICT di kalangan guru dalam pengajaran dan pembelajaran berada di tahap yang rendah. Kajian oleh Rohaya (2012) juga menunjukkan kebanyakan guru mempunyai tahap kesedaran yang tinggi terhadap kepentingan pengintegrasian ICT dalam P&P. Walau bagaimanapun, amalan guru dalam mengaplikasikan ICT dalam P&P adalah sederhana.

Dengan mewujudkan *Online Learning* seperti FROG VLE di dalam sistem pendidikan, ia boleh dijadikan satu kaedah asas pembelajaran untuk membantu melicinkan proses pembelajaran terdahulu yang lebih bersifat tradisional. Revolusi pembelajaran secara maya ini membolehkan guru memanjangkan masa penggunaan ICT dalam P&P selain membuatkan proses pembelajaran lebih seronok. Perkembangan teknologi tinggi kini memungkinkan informasi bergerak tanpa had dan sempadan. Segala-galanya boleh didapati dengan segera dan pantas melalui media elektronik. Kemajuan teknologi yang canggih bukan hanya mampu menjimatkan masa dan penggunaan tenaga malah memudahkan pemindahan dan transformasi maklumat untuk bergerak dan berlaku dalam ruang siber atau maya yang tiada lokasinya yang kini semakin menjadi realiti dalam dunia pendidikan di Malaysia (Azwan dan Rozita, 2002). Oleh kerana pengimplementasian teknologi ini masih baru lagi, kebanyakannya hanya berbentuk *Blended Learning* dimana *Online Learning* adalah pemudah cara atau sokongan kepada proses pengajaran dan pembelajaran konvensional (Ahmad Johari

& Norbaizura, 2010).

Oleh yang demikian, kehadiran FROG VLE memerlukan guru untuk bersedia meningkatkan pengetahuan dan kemahiran mereka dalam penggunaan FROG VLE didalam P&P sepenuhnya bagi menggantikan pendekatan konvensional. Perkembangan pendidikan baharu dalam pengetahuan ICT memerlukan anjakan peranan pendidikan dan profesion keguruan. Negara membangun memerlukan lebih ramai guru yang mempunyai pengkhususan bidang pengetahuan dalam ICT. Latihan pendidikan guru juga memerlukan perubahan paradigma bagi melahirkan guru-guru yang berkelayakkan dan berkebolehan mendidik dan membangunkan masyarakat dan negara. Untuk menerajui pendidikan pada masa hadapan, setiap guru perlu memahirkan diri dengan ICT. Strategi meningkatkan penggunaan ICT di sekolah bergantung kepada kemampuan pengetua dan guru-guru menguruskannya. Ketrampilan dalam ICT adalah satu kriteria penting dalam sistem pendidikan abad ke-21. Pencarian maklumat melalui internet merupakan aset yang akan dapat menjayakan pendidikan pada masa hadapan (Ting Kung Shiung & Woo Yoke Ling, 2005).

Guru yang berkualiti akan dapat meningkatkan komitmen pelajar dalam aktiviti pembelajaran mereka serta menggalakkan penglibatan intelektual pelajar dalam proses pengajaran dan pembelajaran (P&P) di dalam bilik darjah. Perkara ini secara tidak langsung akan dapat meningkatkan pencapaian pelajar tersebut (Rohani *et al.*, 2010). Keperluan untuk merancang kualiti P&P secara *Online Learning* adalah amat penting. Oleh itu guru-guru memerlukan satu garis panduan untuk menjalankan P&P melalui *Online Learning*. Ia termasuklah senarai aktiviti-aktiviti pembelajaran, jenis aktiviti dan cara aktiviti dijalankan. Ia diharapkan dapat menyumbang untuk memahami hubungan antara pedagogi, teknologi dan kandungan serta mengurangkan masa perancangan untuk mengajar secara *Online Learning* (Mohammed Modeef Alsofyani & Baharuddin Bin Aris, 2011).

Dengan ini, guru-guru perlu menggunakan platform Frog VLE ini secara maksimum berdasarkan satu garis panduan yang

berteraskan aspek pedagogi dan teori yang bersesuaian dalam penggunaan platform tersebut. Ini disokong oleh kajian yang telah dilaksanakan oleh Rafiza & Maryam (2013), yang mendapati bahawa pentingnya panduan dalam membangunkan media pengajaran berasaskan multimedia yang mampu memberikan impak yang maksimum dalam proses pengajaran dan pembelajaran dan guru-guru ICTL yang mahir menggunakan teknologi masih memerlukan panduan dalam membangunkan media pengajaran. Ini kerana, pembinaan media pengajaran berasaskan multimedia tidak terletak kepada kepakaran teknologi semata-mata, namun memerlukan pengintegrasian aspek psikologi pembelajaran yang bersesuaian dengan keperluan pelajar serta pedagogi pengajaran yang juga berkait rapat juga dengan rekabentuk bahan.

Dalam menjalankan P&P dengan menggunakan *Online Learning*, ramai guru dan pendidik tidak mengetahui tentang peraturan-peraturan yang perlu dipatuhi dan diikuti bagi memastikan bahan pengajaran yang dihasilkan berkualiti. Ini kerana tidak banyak panduan disediakan untuk dijadikan garis panduan kepada pereka bentuk bahan pengajaran multimedia.

Menurut Rio Sumarni (2007), reka bentuk pengajaran merupakan pembinaan spesifikasi pengajaran yang sistematik dengan menggunakan teori pengajaran dan pembelajaran untuk menjamin mutupengajaran. Ia merupakan satu proses menyeluruh yang menganalisis keperluan dan matlamat serta perkembangan sistem penyampaian untuk memenuhi kesemua keperluan tersebut. Rekabentuk pengajaran meliputi pembinaan bahan pengajaran, aktiviti, percubaan dan penilaiankeseluruhan pengajaran dan aktiviti pelajar. Perlu ditegaskan juga bahawa rekabentuk danpembinaan pengajaran dan pembelajaran mesti mengambil kira aspek pedagogi, teori pembelajaran, teori rekabentuk pengajaran dan model serta media dan teknologi yang akan digunakan.

Menyedari kepentingan pembelajaran secara *Online Learning* perlu diterapkan kepada pelajar-pelajar di dalam sistem pendidikan kita sekarang ini maka penyelidik berpendapat suatu kajian untuk melihat sejauhmana strategi pembelajaran secara kolaboratif atas talian boleh dijadikan garis panduan dalam

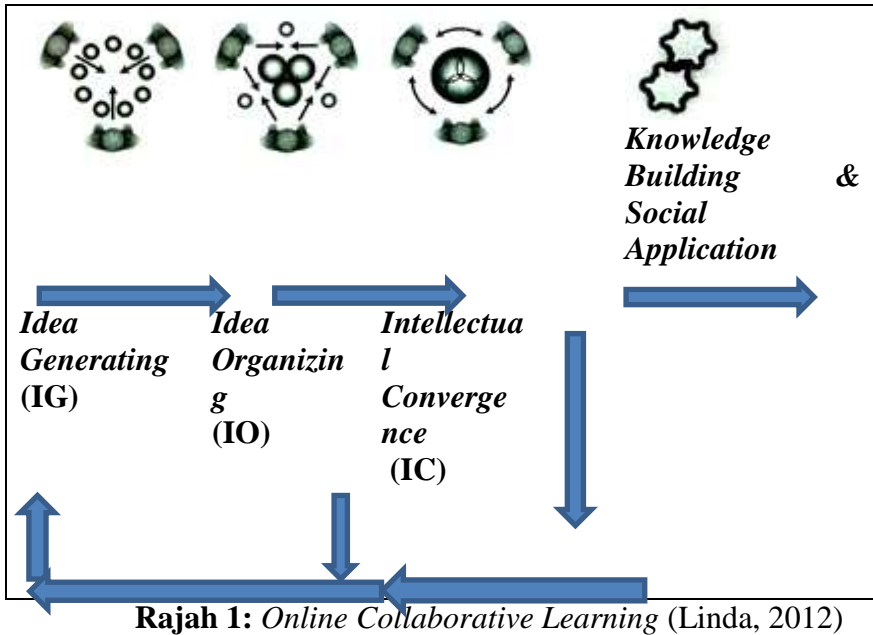
meningkatkan penggunaan guru terhadap FROG VLE ini selain dapat menarik minat pelajar terhadap P&P guru.

1.3 KAJIAN LITERATUR

Kajian ini adalah dijalankan bagi membina satu garis panduan dalam menjalankan Frog VLE di sekolah dengan menggunakan strategi pembelajaran yang sesuai. Oleh itu beberapa teori dan strategi pembelajaran yang digunakan akan dihuraikan.

1.3.1 ONLINE COLLABORATIVE LEARNING (OCL)

Online Collaborative Learning (OCL) seperti dalam Rajah 1 digunakan kerana ianya adalah satu teori pembelajaran yang baru yang memfokuskan kepada pembelajaran kolaboratif, *knowledge building*, penggunaan Internet dalam pembelajaran secara formal dan tidak formal dalam abad 21 yang lebih dikenali sebagai *Knowledge Age*. Ianya menyediakan aktiviti berpusatkan pelajar dan guru juga berperanan sebagai pemudahcara bagi memberi sokongan terhadap sesuatu aktiviti dan sehingga terbinanya sesuatu rangka pemahaman pelajar.



Jadual 1 menunjukkan fasa dan deskripsi di dalam *Online Collaborative Learning*(Linda, 2012)

Jadual 1: Fasa dalam *Online Collaborative Learning* (Linda, 2012)

Fasa	Deskripsi
<i>Idea Generating (IG)</i>	1. Peserta membuat aktiviti berfikir secara pemikiran bercapah dalam kumpulan masing-masing dan menjalankan aktiviti-aktiviti seperti: <ol style="list-style-type: none"> i) sumbang saran ii) verbalization iii) proses menjana maklumat iv) berkongsi idea dan kedudukan dalam topik tertentu 2. Peserta terlibat dalam peserta demokratik 3. Menyumbang ke arah membina satu set

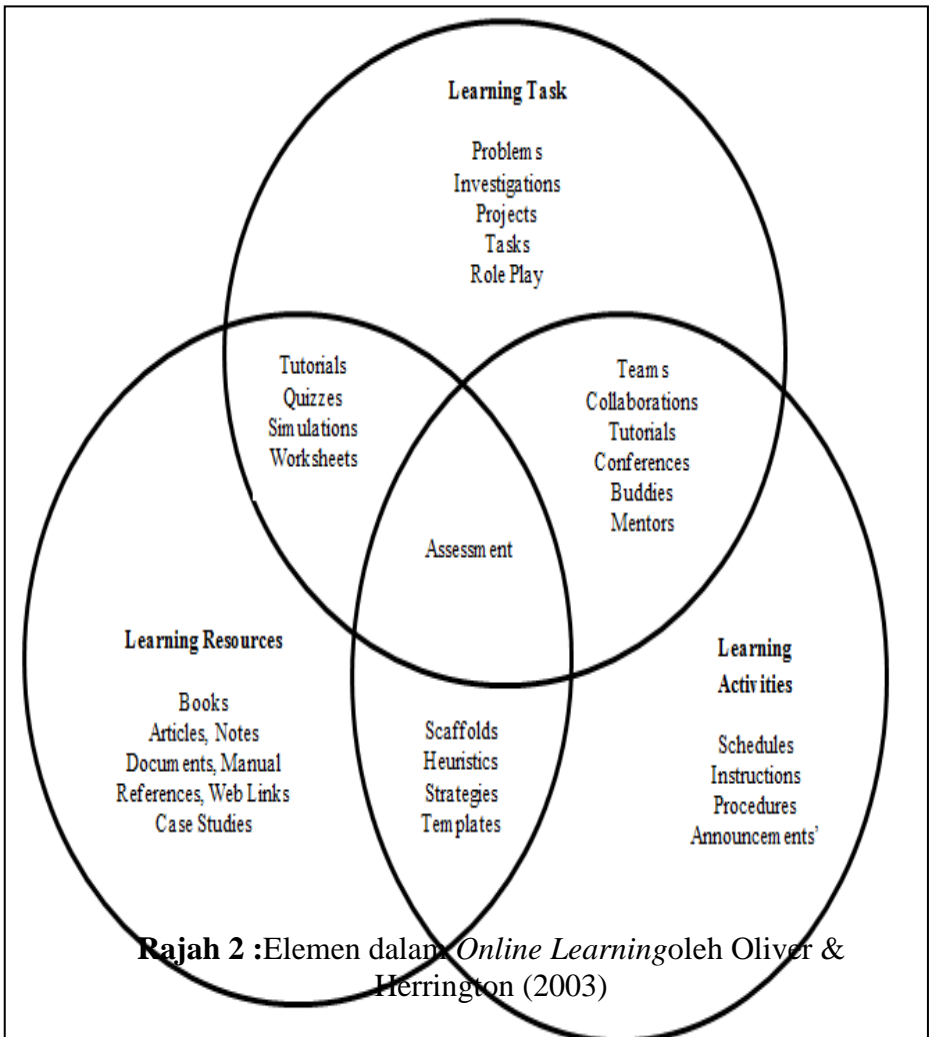
	besar dan pelbagai idea dan perspektif.
<i>Idea Organizing (IO)</i>	<ol style="list-style-type: none"> 1. Adanya perubahan konsep dan menunjukkan kemajuan dari segi intelektual. 2. Bermula penumpuan idea-idea apabila peserta menghadapi idea-idea baru atau idea yang berbeza. 3. Menjelaskan dan mengelompokkan idea-idea lama dan baru mengikut hubungan dan persamaan mereka satu sama lain. 4. Memilih idea yang paling bernas dan mengeluarkan idea yang lemah melalui persetujuan bersama. 5. Terdapat kemajuan intelektual melalui pengiktirafan perspektif pelbagai dan mengenal pasti bagaimana ia berkait atau tidak dengan topik.
<i>Intellectual Convergence (IC)</i>	<ol style="list-style-type: none"> 1. Refleksi terhadap pemahaman bersama (termasuk bersetuju untuk tidak bersetuju). 2. Satu pembinaan pengetahuan bersama untuk dikongsi dandifahami. 3. Penstrukturan idea dimana para peserta dalam perbincangan bersetuju atau tidak bersetuju dalam menghasilkan kesimpulan - penyelesaian kepada masalah, reka bentuk, tugas, teori, penerbitan atau kerja-kerja seni.

1.3.2 PENDEKATAN STARATEGI PEMBELAJARAN ONLINE LEARNING

Pendekatan strategi pembelajaran yang digunakan adalah merujuk kepada Oliver &Herrington(2003). Strategi ini menggunakan pendekatan konstruktivisme iaitu membina pengetahuan dimana pembelajaran dilihat sebagai pembinaan makna dan bukan sebagai yang menghafal fakta-fakta. Tiga

peringkat yang disediakan di mana pelajar belajar dengan menggunakan teknologi dan guru-guru dalam talian masih memainkan peranan asas dalam menyokong dan memudahkan pemahaman pelajar.

Rajah 2 menunjukkan elemen-elemen yang terkandung dalam Online Learning yang dikemukakan oleh Oliver & Herrington (2003).



Elemen yang terkandung di dalam *Online Learning* adalah:

- a) *Learning Tasks*: Untuk melibatkan diri dan mengarahkan pelajar dalam *Online Learning* dalam proses pemerolehan pengetahuan dan pembangunan pemahaman pelajar
- b) *Learning Support*: Untuk membina kerangka pemahaman pelajar dalam proses pemerolehan pengetahuan.
- c) *Learning Resources*: Diperlukan oleh pelajar untuk menyelesaikan tugas yang ditetapkan dan untuk memberi panduan dalam membina kerangka pemahaman pelajar.

1.4 KESIMPULAN

Bagi meningkatkan penggunaan FROG VLE dikalangan guru-guru disekolah dicadangkan penggunaan strategi pembelajaran kolaboratif atas talian. Rujukan yang digunakan adalah strategi *Online Collaborative Learning* (Linda, 2012) dan juga Oliver & Herrington (2003).

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IMPAK LAPORAN Pemeriksaan Penuh Nazir Sekolah ke Atas Pengurusan Kurikulum Sekolah Menengah di Negeri Sabah

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ABSTRAK

Kajian menggunakan kaedah kualitatif ini bertujuan untuk mengenal pasti status penambahbaikan dalam pengurusan kurikulum sekolah menengah dalam tempoh enam bulan selepas menerima pemeriksaan dan laporan Pemeriksaan Penuh. Sebanyak lima laporan Pemeriksaan Penuh dan lima laporan Pemeriksaan Tindak Ikut di lima buah sekolah menengah menjadi bahan kajian. Kelima-lima sekolah menengah yang terletak di negeri Sabah tersebut telah mengalami Pemeriksaan Penuh oleh Nazir Sekolah dari Jemaah Nazir Sekolah atau Jemaah Nazir dan Jaminan Kualiti, Kementerian Pendidikan Malaysia pada tahun 2006 hingga 2010. Sepuluh teks laporan tersebut dianalisis menggunakan kaedah *text descriptive* oleh Shannon dan Hsieh. Kajian ini mendapati bahawa ketidakpatuhan utama adalah pada penyediaan Rancangan Pelajaran Tahunan dan penyediaan jadual waktu. Kajian ini juga mendapati bahawa impak terhadap penyediaan jadual waktu dalam tempoh enam bulan selepas Pemeriksaan Penuh adalah 80 peratus.

1.0 PENGENALAN

Sejak mencapai kemerdekaan pada tahun 1957 dan seterusnya pembentukan Malaysia pada tahun 1963, Malaysia telah menjadi negara yang mengurus pendidikan sebagai pelaburan sumber manusia bagi negara bangsanya. Penyata Razak 1956 dan Ordinan Pelajaran 1957 merubah sejarah pendidikan negara daripada pendidikan era penjajah kepada wahana untuk mencapai keperluan sebuah negara merdeka. Laporan Rahman Talib 1960, Laporan Kabinet 1979 dan seterusnya Akta Pendidikan 1996 serta Falsafah Pendidikan Kebangsaan, menjadikan pendidikan negara ini bergerak progresif dan menjadi teras kepada penggubalan dan pelaksanaan perancangan strategik dan program-program pendidikan seterusnya misalnya Pelan Induk Pembangunan Pelan Induk Pembangunan Pendidikan (PIPP) 2006-2010 dan kini Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025.

2.0 DEFINISI OPERASIONAL

2.1 Pemeriksaan Penuh

Pemeriksaan Penuh adalah salah satu pemeriksaan yang dilaksanakan oleh JNJK untuk memastikan Akta Pendidikan 1996 (Akta 550) seksyen 117 hingga 122 dilaksanakan di institusi pendidikan. Dalam tempoh kajian (2006-2010), hanya sebuah sekolah menengah dipilih untuk Pemeriksaan Penuh setahun bagi negeri Sabah (JNJK Sabah, 2006-2010). Pemeriksaan Penuh merupakan pemeriksaan menyeluruh dilaksanakan dalam tempoh lima hari bekerja (Isnin hingga Jumaat) di sekolah-sekolah tersebut oleh sekumpulan Nazir Sekolah dengan jumlah maksimum 25 orang mengikut opsyen mata pelajaran dengan diketuai oleh Ketua Nazir Negeri Sabah. Pemeriksaan ini menggunakan instrumen Standard Kualiti Pendidikan Malaysia

(SKPM) versi 2003. Instrumen *Annex* yang telah melepasi proses kualiti di JNJK Ibu Pejabat Putrajaya juga digunakan untuk melaporkan prestasi pengurusan mata pelajaran. Pemeriksaan ini bertujuan untuk memeriksa pengurusan dan pentadbiran sekolah, pengajaran dan pembelajaran serta pelaksanaan dasar dan program pendidikan di sekolah berkenaan (KPM, JNJK, 2010).

2.2. Pengurusan Kurikulum

SKPM versi 2010 menyatakan pengurusan kurikulum dalam Standard 3.1: Pengurusan Kurikulum dengan perincian seperti berikut:

- 3.1.1 Ketetapan pelaksanaan kurikulum
- 3.1.2 Pengurusan mata pelajaran
- 3.1.3 Pengurusan program peningkatan murid
- 3.1.4 Jadual waktu
- 3.1.5 Pengurusan peperiksaan, pentaksiran dan penilaian

2.3 Punca Kuasa Pengurusan Kurikulum

Pengurusan kurikulum dalam konteks kajian ini merujuk kepada pelaksanaan kurikulum kebangsaan. Peraturan-Peraturan Pendidikan (Kurikulum Kebangsaan) 1997 yang bagi kajian ini hanya merujuk kepada perkara-perkara berkaitan akademik seperti yang terkandung dalam peraturan-peraturan 1997 seperti berikut:

Peraturan 3(2): Kurikulum bagi sekolah kerajaan dan bantuan kerajaan mengandungi mata pelajaran teras, mata pelajaran wajib, mata pelajaran tambahan, mata pelajaran elektif, mata pelajaran untuk kelas peralihan dan mata pelajaran untuk peringkat Sijil Tinggi Persekolahan Malaysia atau Tingkatan Enam;

Peraturan 3(4): Peruntukan waktu minimum seminggu untuk mata pelajaran yang diajar di bawah kurikulum bagi sekolah kerajaan dan bantuan kerajaan;

Peraturan 4: Bahan kurikulum yang sesuai bagi pengajaran dan

pembelajaran kurikulum di sekolah kerajaan dan bantuan kerajaan yang ditentukan oleh menteri;

Peraturan 5: Perubahan jadual, sukatan pelajaran dan jadual waktu. Hanya Ketua Pendaftar yang boleh mengubah atau meminda jadual mengenai semua mata pelajaran yang diajar di suatu sekolah, sukatan pelajaran, atau jadual waktu yang telah diubah atau dipinda hendaklah terpakai di sekolah itu;

Peraturan 6: Jadual, sukatan pelajaran dan jadual waktu diadakan untuk pemeriksaan oleh Ketua Pendaftar;

Peraturan 7: Guru perlu mengadakan salinan sukatan pelajaran yang diluluskan dan senarai murid-murid untuk pemeriksaan;

Peraturan 8: Buku Rekod Guru. Guru hendaklah menyimpan dan menyenggara suatu buku rekod dalam mana hendaklah direkod olehnya tidak lewat daripada hari terakhir persekolahan setiap minggu dalam satu penggal persekolahan, bahagian atau bahagian-bahagian sukatan pelajaran yang diluluskan yang akan diajar pada minggu berikutnya...dan buku rekod hendaklah dengan serta-merta diadakan untuk pemeriksaan oleh Ketua Pendaftar;

Peraturan 9: Jadual, sukatan pelajaran dsb. dalam bahasa selain daripada bahasa kebangsaan diterjemah ke dalam bahasa kebangsaan dalam tempoh 30 hari daripada tarikh diarah oleh Ketua Pendaftar; dan

Peraturan 10: Jadual waktu dipamerkan oleh guru besar atau pengetua yang telah ditandatangani olehnya di suatu tempat yang mudah dilihat di sekolah itu.

2.4 Impak Pemeriksaan Penuh

Dalam laporan Pemeriksaan Penuh, JNJK mengemukakan Dapatan Utama, iaitu senarai ketidakpatuhan kritikal sekolah terhadap peraturan pendidikan untuk diperbetulkan oleh sekolah dalam tempoh enam bulan dari tarikh pemeriksaan. Dapatan Utama merupakan ekstrak daripada laporan terperinci yang menyatakan keadaan semasa, kekuatan dan kelemahan dalam pengurusan sesebuah sekolah. Dapatan Utama tidak terhad kepada pengurusan kurikulum sahaja. Lazimnya, pada minggu terakhir bulan keenam, nazir akan datang semula dalam jumlah yang lebih kecil untuk melaksanakan Pemeriksaan Tindak Ikut dan melaporkan tindakan penambahbaikan yang telah dilaksanakan oleh sekolah terhadap Dapatan Utama. Laporan Pemeriksaan Tindak Ikut akan dikeluarkan kepada sekolah yang menyatakan status pelaksanaan penambahbaikan dan perkara yang perlu diteruskan untuk kecemerlangan pengurusan pendidikan di sekolah tersebut. Impak laporan Pemeriksaan Penuh tersebut dinilai dari status penambahbaikan yang dibuat oleh sekolah terhadap ketidakpatuhan yang dinyatakan dalam Dapatan Utama.

3.0 OBJEKTIF KAJIAN

Objektif kajian adalah seperti berikut:

- 3.1 Mengenal pasti status kepatuhan sekolah terhadap dasar pengurusan kurikulum KPM melalui analisis teks Laporan Pemeriksaan Penuh di lima buah sekolah menengah di negeri Sabah dari tahun 2006 hingga 2010.
- 3.2 Mengenal pasti status pelaksanaan penambahbaikan yang telah dilaksanakan dalam tempoh enam bulan oleh lima buah sekolah terhadap cadangan dan syor oleh nazir.

4.0 PERSOALAN KAJIAN

Persoalan kajian adalah seperti berikut:

- 4.1 Berdasarkan laporan Pemeriksaan Penuh oleh JNJK, apakah tahap kepatuhan sekolah terhadap punca kuasa pengurusan kurikulum KPM?
- 4.2 Sejauhmanakah sekolah responsif terhadap syor dan cadangan penambahbaikan oleh nazir dalam tempoh enam bulan dari tarikh pemeriksaan?

5.0 SOROTAN LITERATUR

Laporan Pemeriksaan Penuh tahun 2009 merupakan analisis data kuantitatif yang diperolehi menggunakan instrumen SKPM versi 2003 dalam Pemeriksaan Penuh di 15 buah sekolah menengah di seluruh negara iaitu sebuah sekolah dari setiap negeri Perlis, Sabah, Melaka, Negeri Sembilan, Selangor, Perak, Kedah, Wilayah Persekutuan Kuala Lumpur, Johor, Terengganu, Kelantan, Pahang dan Wilayah Persekutuan Labuan.

Laporan Pemeriksaan Penuh (KPM JNJK, 2009) yang dikemukakan kepada Menteri Pelajaran, mendapati pencapaian objektif kedua pemeriksaan iaitu prestasi keseluruhan kualiti pengajaran dan pembelajaran sebagai berada pada tahap sederhana. Kumpulan guru yang diperiksa didapati mampu menyampaikan pengajaran dengan berkesan berdasarkan objektif yang ditetapkan. Namun begitu, penyampaian dan perkembangan pengajaran sebahagian besar guru masih berpusatkan guru. Manakala, kesediaan murid untuk belajar adalah sederhana. Hasil kerja kebanyakan murid masih belum kemas dan penghantaran buku latihan tidak menepati masa.

Dalam proses melengkapkan satu pusingan pemastian matlamat pendidikan itu tercapai, JNJK dengan menggunakan laporan Pemeriksaan Penuh yang disatukan dari seluruh negara dan dibentangkan kepada Menteri Pelajaran untuk mendapatkan ulasan. Salah satu laporan yang dibentangkan kepada Menteri Pelajaran adalah Pemeriksaan Penuh Sekolah Menengah pada 3 Januari 2013 dalam Mesyuarat dan Rumusan Pembentangan

Laporan Kebangsaan Pemeriksaan JNJK 2012 yang dipengerusikan oleh Menteri Pelajaran (KPM, 2013). Pembentangan tersebut menyentuh dua perkara utama iaitu kepimpinan pengetua sebagai pemimpin instruksional, pengurusan kurikulum, kokurikulum, sukan dan hal ehwal murid (HEM), dan taraf guru. Untuk mengatasi ketidaksempurnaan hasil dan proses, Menteri Pelajaran telah memutuskan supaya Bahagian Pengurusan Sekolah Harian (BPSH), Institut Aminuddin Baki (IAB), dan Jabatan Pelajaran Negeri (JPN) mengambil tindakan selanjutnya. Keputusan tersebut yang berbentuk arahan kepada bahagian-bahagian berkenaan supaya:

1. BPSH dan IAB mempertingkatkan kemampuan pengetua sebagai pemimpin kurikulum,
2. JPN memastikan pengurusan sekolah mematuhi ketetapan dasar dan Surat Pekeliling Ikhtisas (SPI), dan
3. BPSH memberi autonomi kepada sekolah band 1 dan 2 dalam melaksanakan jadual waktu dan pelaksanaan PdP.

5.0 DAPATAN KAJIAN

5.1 Ketidapatuhan Yang Dikesan Melalui Laporan Pemeriksaan Penuh

Jadual 1: Ketidapatuhan Akta Pendidikan 1996 (Akta 550) Dan Surat Pekeliling Ikhtisas Berkaitan

B i l.	Ketidapa- tuan Akta 550 & SPI Berkaitan	Sekolah A	Sekolah B	Sekolah C	Sekolah D	Sekolah E	Kekerapan (%)
1	Penyediaan Rancangan Pelajaran Harian	√	√	Tidak dinyatakan	√	Tidak dinyatakan	3/5 (60.0%)
2	Rancangan Pelajaran Tahunan	√	√	√	√	√	5/5 (100.0%)
3	Penyemakan	√	Tidak	Tidak	√	Tidak	2/5

	Rekod Pengajaran oleh Guru Besar/Pengetua		dinyatakan	dinyatakan		dinyatakan	(40.0%)
4	Penyediaan Jadual Waktu Induk, Kelas, Guru dan Bilik Khas yang disahkan oleh Guru Besar/Pengetua	√	√	√	√	√	5/5 (100.0%)

Jadual 1 di atas menunjukkan ketidakurusan sekolah terhadap punca kuasa teras dalam pengurusan kurikulum walaupun dalam Akta Pendidikan 1996 dinyatakan bahawa pelanggaran kepada kewajipan itu boleh dikenakan penalti. Penyediaan Rancangan Pelajaran Tahunan dan jadual waktu merupakan ketidakurusan yang berlaku di kelima-lima sekolah. Kesemua sekolah (100.0 peratus) terlibat dalam ketidakurusan tersebut. Sementara berlaku ketidakurusan di tiga buah sekolah atau 60.0 peratus bagi penyediaan Rancangan Pelajaran Harian dan dua sekolah (40.0 peratus) terlibat dalam ketidakurusan bagi penyemakan rekod pengajaran Pengetua. Kertas kajian ini hanya akan membincangkan ketidakpatuhan terhadap peraturan penyediaan jadual waktu.

Sebanyak enam (6) ketidakpatuhan jadual waktu yang dapat dikesan melalui laporan Pemeriksaan Penuh di lima buah sekolah tersebut. Punca kuasa berkaitan penyediaan jadual waktu adalah Peraturan-Peraturan Pendidikan (Kurikulum Kebangsaan) 1997 Peraturan 3(2) dan (4) serta Peraturan 10. Ketidakpatuhan kelima-lima sekolah berlaku terhadap Peraturan 3 (4) Peruntukan waktu minimum seminggu untuk mata pelajaran yang diajar di bawah kurikulum bagi sekolah kerajaan dan bantuan kerajaan di subperaturan (2) adalah dinyatakan dalam Jadual 11 hingga 15 Peraturan tersebut. Peraturan 11 menyatakan penalti bagi seseorang guru atau mana-mana orang yang membenarkan seseorang guru mengajar murid melainkan daripada mengikut

jadual waktu yang diluluskan adalah melakukan suatu kesalahan dan apabila disabitkan boleh didenda tidak melebihi lima ribu ringgit atau dipenjarakan selama tempoh tidak melebihi tiga bulan atau kedua-duanya.

Tiga daripada enam pelanggaran, adalah seperti berikut:

Ketidakpatuhan 1: Mengurangkan masa pembelajaran suatu mata pelajaran daripada jumlah waktu minimum:

Sekolah A : Sains yang sepatutnya 5 dikurangkan menjadi 4 waktu.

Sekolah C : (1) Sains teras di Tingkatan 4 yang sepatutnya diajar 5 waktu hanya diperuntukkan 4 waktu.

(2) Bahasa Melayu Tingkatan 6 sepatutnya diperuntukkan 8 waktu telah dikurangkan kepada 6 waktu.

(3) Sebahagian waktu PJK diambil untuk mata pelajaran Sejarah Tingkatan 5.

Sekolah D : Sains dan Matematik yang hanya 4 waktu daripada 5 waktu sepatutnya

Perlindungan berlaku terhadap subperaturan 3(4) Jadual 13 (Peraturan-Peraturan Pendidikan (Kurikulum Kebangsaan) 1997 dalam Lembaga Penyelidikan Undang-Undang, 2001) yang menyatakan peruntukan waktu minimum seminggu peringkat menengah rendah dan Jadual 14: Peruntukan Waktu Minimum Seminggu Peringkat Menengah Atas (40 minit suatu waktu) iaitu Sains 5 waktu, dan Matematik 5 waktu bagi Sekolah A, C dan D. Sekolah C juga tidak patuh kepada Jadual 15 dalam peraturan yang menyatakan peruntukan minimum seminggu peringkat Sijil Tinggi Persekolahan Malaysia (STPM)/ Tingkatan Enam (40 waktu seminggu) bagi mata pelajaran Bahasa Melayu yang sepatutnya 8 waktu.

Ketidakpatuhan 2: Gabungan beberapa mata pelajaran yang tidak mematuhi peraturan:

Sekolah A: Terdapat waktu pengajaran bagi kelas tertentu dipecahkan kepada 3 mata pelajaran (Bahasa Arab,

PJK dan Pendidikan Seni) yang dilaksanakan serentak. Sekolah D: Mata pelajaran wajib Pendidikan Seni Visual atau Pendidikan Muzik tidak diambil oleh murid yang mengikuti mata pelajaran Bahasa Kadazandusun kerana Bahasa Kadazandusun diadakan serentak dengan PSV atau Pendidikan Muzik.

Dalam Jadual 13 Peraturan-Peraturan Pendidikan (Kurikulum Kebangsaan) 1997, diberi peruntukan waktu seminggu mata pelajaran Pendidikan Jasmani dan Kesihatan (PJK) dua masa (80 minit) , Pendidikan Seni 2 masa (80 minit), Pendidikan Muzik dua masa (80 minit) dan Bahasa Arab (Komunikasi) enam waktu (240 minit) waktu. Sementara dalam Jadual 6 dinyatakan bahawa mata pelajaran PJK dan Pendidikan Seni/Pendidikan Muzik (pilih satu) adalah mata pelajaran wajib (wajib ditawarkan) kepada murid. Jadual 8 pula menyenaraikan Bahasa Arab (Komunikasi) dan (kemudian diwartakan) Bahasa Kadazandusun 3 masa (120 minit) adalah mata pelajaran Tambahan iaitu boleh diambil berdasarkan pilihan murid. Justeru, apabila PdP ketiga-tiga mata pelajaran dijalankan serentak, murid yang mengambil Pendidikan Seni, tidak berpeluang untuk mengikuti PJK walaupun wajib dipelajari dan ditawarkan kepada semua murid. Dan murid sama yang mengambil Bahasa Arab (Komunikasi), tidak akan dapat mengikuti dua (2) masa PdP bahasa tersebut dalam seminggu.

Ketidakpatuhan 3: Masa mengajar tidak dimasukkan dalam jadual waktu induk dan jadual waktu individu guru:

Sekolah B: Pelaksanaan mata pelajaran English for Science and Technology (EST) mesti dimasukkan dalam jadual waktu sekolah bagi mematuhi SPI7/2002 iaitu pelaksanaan mata pelajaran EST sebagai mata pelajaran wajib untuk murid aliran Sains dan Teknologi.

Sekolah C: Didapati dua waktu pengajaran Pendidikan Agama Islam Menengah Rendah tidak dimasukkan dalam jadual waktu individu guru.

Bagi Sekolah C, Jadual 13 peraturan, menyatakan bahawa peruntukan waktu seminggu mata pelajaran Pendidikan Islam bagi menengah rendah adalah 4 [3+1 (Amali) + 2 (Tambahan)] iaitu 3 waktu PdP di bilik darjah, satu waktu amali dan dua lagi masa tambahan. Dalam amalan sekolah, dua (2) masa tambahan tersebut tidak dimasukkan dalam Jadual Waktu Induk tetapi perlu dimasukkan dalam Jadual Waktu Guru kerana masa pelaksanaan bergantung kepada kesesuaian jadual guru dan murid. Jika dua masa tersebut tidak dimasukkan dalam jadual individu guru, kemungkinan kepada guru untuk tidak mengisi dua masa tersebut untuk PdP kerana faktor sikap dan kelalaian.

Penawaran mata pelajaran English for Science and Technology adalah berdasarkan Surat Pekeliling Ikhtisas Bilangan 7 Tahun 2002: Pelaksanaan Mata Pelajaran English for Science and Technology (EST). Perkara 3 SPI tersebut menyatakan seperti berikut yang telah tidak dipatuhi oleh Sekolah B.

3. Peruntukan masa pengajaran dan pembelajaran EST adalah sebanyak tiga (3) waktu iaitu seratus dua puluh (120) minit seminggu dan hendaklah dimasukkan dalam jadual waktu rasmi sekolah.

5.2 Penambahbaikan Yang Telah Dilaksanakan Oleh Sekolah Dalam Tempoh Enam Bulan

Jadual 2: Tindakan Penambahbaikan Terhadap Ketidakpatuhan Penyediaan Jadual Waktu

Sekolah	Tindakan yang Telah Diambil
A	1. Jadual waktu telah disusun semula dan patuh kepada dasar. 2. Sistem jual beli kelas dan jadual ganti telah dilaksanakan.
B	Tiada penambahbaikan dilaksanakan oleh sekolah
C	1. Jadual waktu sekolah telah mematuhi dasar

	<p>kurikulum kebangsaan.</p> <p>2. Jawatankuasa Jadual Waktu telah dikemas kini dan telah dapat menyelesaikan masalah penjadualan mata pelajaran dan bilik darjah</p>
D	<p>1. Kelas sementara untuk Bahasa Kadazandusun dan Pendidikan Moral telah dipasang (kanopi & penghadang di ruang lapang)</p> <p>2. Masa PdP PJK telah diubah sebelum rehat sidang pagi dan selepas rehat sidang petang.</p> <p>3. Bilangan masa Matematik telah diubah kepada 5 waktu.</p>
E	<p>Jadual waktu baru telah disediakan.</p> <p>Masalah pertindihan kelas telah diatasi</p>

Berdasarkan tindakan sekolah dalam Jadual 2 di atas, didapati semua sekolah kecuali Sekolah B yang membawa nilai 80.0 peratus, telah melaksanakan penambahbaikan selaras dengan saranan nazir sekolah.

6.0 KESIMPULAN

Laporan Pemeriksaan Penuh dapat membantu sekolah mengurus kurikulum dengan lebih tepat selaras dengan peraturan Kementerian Pendidikan Malaysia jika digunakan oleh sekolah sebaik-baiknya seperti yang telah dilaksanakan oleh Sekolah A, C, D dan E.

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EVALUATING STUDENTS' PATTERN OF INTERACTION IN ONLINE COURSES

Juhazren Junaidi & ZaidatunTasir

ABSTRAK

Online interaction has become a primary focus in research in online learning. Interaction promotes participation and provide educational experience to students while involved in online learning. Participation in online learning is obtained from high levels of interaction. Encouraging participation is one of the key challenges in online learning. Students will find themselves taking part in the learning process by participating. Previous research have found that participation can be measured as interaction. There are three dimensions of interaction: (1) student-content, (2) student-instructor, and (3) student-student. This paper explores several research on interaction in online learning. The purpose of this paper is to view tools for evaluating interaction in online learning. Approaches for studying online learner participation is also discussed.

Keywords: Online learning, Online interaction, Online Participation

INTRODUCTION

The primary focus in the research of online learning is interaction, which is central to an educational experience (Garrison & Cleveland-Innes, 2005). Although interaction alone does not represent participation (Garrison, Anderson & Archer, 2000), however interaction could promote participation and engage

students in learning (Hrastinski, 2009). Researchers have widely agreed that in an e-learning environment, students could learn better by participating (Hrastinski, 2009). As distinguished by Moore (1989) that there are three dimensions of interaction in an e-learning environment: learner-instructor, learner-content and learner-learner. It has been suggested that participation of a student can be measured by accumulating the interactions that occurred in an e-learning forum (Davies & Graff, 2005; Lipponen *et al.*, 2003).

One of the key challenges in e-learning is to encourage participation (Bento & Schuster, 2003), which means that students need to be encouraged to interact online. By participating, students will find themselves taking part in the learning process. Vonderwell and Zachariah (2005) noted that through interactions, students will become interdependent, able to share learning goals and information, creating path towards effective learning. Previous research had indicated that participation when measured as interaction with peers and instructors, stimulated and encouraged perceived learning (Hrastinski, 2008).

ONLINE INTERACTION

There have been many research on interaction in online learning environments in promoting learning (e.g., Moore, 1989; Swan, 2002). In this age of communication and internet technologies, a lot of our daily routines involve online interactions. In education, interaction is essential. Previous research had shown that students' interaction with instructors and peers could improve learning (e.g., Kearsley, 1995; Picciano, 2002; Wilson & Stacey, 2004). The more the students interact the more it could contribute to learning. In an online learning environment, students' learning process could be triggered through sharing perspectives and information, seeking feedback and clarifying ideas through interaction with instructor and peers (Wilson & Stacey, 2004). Students and instructors today can take the advantage of continuous connectivity to the internet as a medium for interactivity as well as maintaining their engagement

to the learning environment.

Garrison and Cleveland-Innes (2005) suggested that the interaction in an online learning environment must be structured and systematic in order to achieve defined learning outcomes. Students' learning are not necessarily measured based on their number of interactions only. They added that interaction for learning in online environment must go beyond simple exchange of information by including various combinations of interaction.

The work of Swan and Shih (2005) is in line with Garrison and Cleveland-Innes (2005) where it was argued that interaction by itself is not a guarantee that students are engaged cognitively in the learning through online environments. However, Garrison and Cleveland-Innes did mention that interaction is a crucial variable in online learning. In addition, by providing the students with proper structure and guidance through interaction, they will be able to maintain engagement and be responsible for their learning. Furthermore, the students themselves need to engage themselves with the discussions, reflecting and construct meaning to produce understanding, which can be achieve in online learning through interactions. Active interactions will allow the construction of new ideas and concepts thus enabling learning to occur (Wilson & Stacey, 2004).

Table 1 Types of Interactivity in Online Learning (Moore, 1989)

Types	Ability
Interaction with Content	access, manipulate, synthesize, communicate content information
Interaction with Instructors	communication skills, receiving and providing feedbacks
Interaction with Peers	communication skills, connection building, sharing, receiving and providing feedbacks, support

INTERACTION WITH CONTENT

There are a significantly huge amount of information content that are available and can be obtained from the internet or World Wide Web. Students and instructors as well can benefit from these available contents. While computers are known to have the capability to assist learning (Taylor, 1980; Cummings, 1988; Kim & Baylor, 2006), the content for online learning needs to be managed and arranged accordingly (Geisert&Futrell, 2000) to create a learning environment so that it would trigger interactions towards achieving the learning outcomes (Taylor, 2003; Baharum, Tretiakov&Kinshuk, 2007; Baylari&Montazer, 2009). The design for online learning is known as being extrapolated from the field of Computer-Based Learning (CBL) and multimedia design (Swan, 2002).

INTERACTION WITH INSTRUCTORS

Learning requires students to interact with instructors. In online learning environment, the similar interaction is needed (Swan, 2002) although there is lacking in terms of social presence (Short *et al.*, 1976; Picciano, 2002). It was mentioned that due to the distance and the delayed timing of asynchronous interaction has lead to the social presence gap. However, through online learning environment students are given the opportunity to grow their communication skills as well as receiving and providing feedbacks while interacting with their instructors (Moore, 1989). These interactions when performed regularly will allow the students to create social presence and feeling comfortable with the learning environment (Richardson & Swan, 2001).Swan and Shih (2005) conducted a study in online discussions and found that although there are different perceptions among students in terms of social presence while interacting in an online environment, through rapport building and proper interaction cues students would be able to increase their perceived learning. Instructors need to play a

major role in developing and modeling social presence factors to enhance and encourage meaningful interaction in online learning (Stacey, 2002). Clearly there are issues within the student-instructor interaction context that need attention and created research opportunity in the field of online pedagogy.

INTERACTION WITH PEERS

Interaction with peers seems to be the most influential aspect of online learning (Swan, 2000). Students are found to be more comfortable interacting with peers and are able to communicate effectively even when online. The theory of social constructivism emphasizes that students will be able to learn and construct their own perspectives through interaction within a group of similar goals (Wilson & Stacey, 2004). Vonderwell and Zachariah (2005) noted that through interactions, students would become interdependent, able to share learning goals and information, creating path towards effective learning.

INCREASING THE AMOUNT OF INTERACTION

In their research, Davies and Graff (2005) found that there is a correlation between interaction rate and passing rate. They concluded their study by mentioning that students who failed in the course modules have less interaction than those students who achieved passing grades. It shows that when a student is more involved in the interaction or discussion, it is more likely that they will become engaged and their learning rate would increase. It is essential for students to actively communicate and providing feedback within an online learning environment (Sims, 2003).

Swan (2002) emphasized that in an e-learning environment, student- instructor interaction and student-student interaction are significantly important. As e-learning environments enables students and instructors to interact asynchronously, the two

important interactions can engage students in discussions related to the course by allowing them to view, observe and reflect upon other coursemates' contributions before coming up with their own and post them. The more involved the students are, the more they will learn through this process. They will be able to comment, give suggestions as well as quote references related to the topic while contributing to others' learning.

EVALUATING INTERACTION

In a particular e-learning environment, researchers will find various kinds of interaction exhibited by students. Among the common are such as sharing perspectives and information, seeking feedback and clarifying ideas, giving comments, quoting references and others. To measure these interactions much more accurately, a researcher will need a coding technique that could assist in understanding the obtained data. MacKinnon (2000) had developed categorical codes of messages posted by students in an e-learning forum. Table 2 illustrates the coding technique suggested and developed by MacKinnon.

Table 2 Categorical Codes for Online Messages

Types of Interaction	Description	Code name
Acknowledge ment of opinions	Evidence of participation	Acknowled ge
Question	Thoughtful query	Question
Compare	Similarity, analogy	Compare
Contrast	Distinction, discriminate	Contrast
Evaluation	Unsubstantiated judgement, value	Evaluation
Idea	to Deduction, analogy	Idea2ex

example			
Example idea	to	Induction, conclusion	Ex2idea
Clarification, elaboration		Reiterating a point, building on a point	Clarify/elab orate
Cause effect	and	Inference, consequence	C&E
Off faulty reasoning	topic/	Entry inappropriate	Off

These 10 types of interaction by MacKinnon (2000) has been referenced by other scholar 54 times to date. Weltzer-Ward (2011) had performed analysis on 51 coding schemes that are commonly used in researching asynchronous online discussions, and MacKinnon's categorical codes was one of the schemes that have been used.

It is also worth to note that for the categorical codes as described in Table 2, the code names can be altered by researchers to suit their own study. MacKinnon (2003) had stated that the categorical codes or 'cognotes' could be used to evaluate interactions as well as using the findings to improve interactions to promote better learning.

ONLINE PARTICIPATION

According to Wenger (1998) it has been argued that participation is an intrinsic part of learning. As in interaction, participating requires the students to be involved in the learning process. Hrastinski (2009) mentioned that in online education, enhancing participation is crucial and the importance was agreed by many researchers. He also quoted Saljo (2000, in Hrastinski, 2009) that participation and learning is an inseparable process which happen during students interaction with others. In his previous work,

Hrastinski (2008) noted that participation can be measured as interaction with peers and instructors. Other research such as Davies and Graff, (2005) and Lipponen *et al.* (2003) suggest that participation of a student can be measured by accumulating the interactions that occurred in an e-learning forum.

Therefore, it can be understood that to enhance participation in e-learning is to enhance interaction among students and instructors. However, even if there is a large amount of interactions in a particular e-learning course, interaction alone does not represent participation (Garrison, Anderson & Archer, 2000). Vonderwell and Zachariah (2005) stressed that participation needs to look at interactions that indicate students taking part as well as maintaining relations with their peers and instructor. This measure would enable researchers to distinguish meaningful interactions from the rest to establish participation.

CONCEPTUALIZATION OF PARTICIPATION

Hrastinski (2009) had conceptualized the participation of online learners. There are four suggested characteristics of online learner participation: (1) Participation is a complex process of taking part and maintaining relations with others, (2) Participation is supported by physical and psychological tools, (3) Participation is not synonymous with talking or writing, and (4) Participation is supported by all kinds of engaging activities.

As a complex process of taking part and maintaining relations with others, Hrastinski referred to Wenger's (1998) definition of participation which partly referring to sense of community. Humans have the need to participate and feel attached to belong to a community. People who have a strong attachment to a group are more likely to participate and help others. Thus, when researching online learner participation the importance of group attachment should not be forgotten. In terms of e-learners, they learn from each other and from the surrounding culture and environment.

In terms of support, participation needs physical and

psychological tools to allow interaction and learning to occur. Physical tools such as computers and other peripherals supports the technical requirements of an online interaction. Whereby psychological tools such as language or motivation helps students to communicate and interact in a manner that is acceptable by each discussion member. These physical and psychological tools has made it possible for students to communicate more frequently with peers and instructors, which in turn enables learners and teachers to share more experiences and information, and engage in meaningful learning.

As important as the above mentioned, participation is not synonymous with talking or writing. Participating is not necessary by talking or writing. Hrastinski noted that “we may participate socially even at times when we are not engaged in a conversation with someone”. Interacting through written messages can be considered as one aspect of online learner participation. What most important in achieving participation is the students give emphasis on understanding and perform reflective observation.

Participation is supported by all kinds of engaging activities. Hrastinski (2009) kept to the assumption that online learner participation drives learning. Learning online is not focused on individual but more of a situation in which two or more people learn or attempt to learn something together through activities such as doing, talking, thinking, feeling and belonging which contributes to participation.

In another paper, Hrastinski (2008) did a review in online participation and suggested a six level description of different ways in which online learner participation is conceptualised. The six levels are:

Table 3 Hrastinski’s (2008) Six Levels of Participation

Level	Description	Assumption	Research Example
1	Participation as a learner that accessing e-learning	access an e-	Davies and Graff

	environments		learning environment many times is assumed to participate more actively than a learner who does not.	(2005)
2	Participation writing	as	a learner that writes many messages or many words is assumed to participate more actively than a learner who does not.	Lipponen, Rahikainen, Lallimo, and Hakkarainen (2003)
3	Participation quality writing	as	a learner that writes many contributions of high quality is assumed to participate more actively than a learner who does not.	Davidson-Shivers, Muilenburg, and Tanner (2001)
4	Participation writing and reading	as	a learner that writes and reads many messages is assumed to participate more actively than a learner who does not.	Lipponen, Rahikainen, Lallimo, and Hakkarainen (2003)
5	Participation actual and perceived writing	as and	a learner that writes many messages that are perceived of	Mazzolini and Maddison (2003)

			importance is assumed to participate more actively than a learner who does not.	
6	Participation as taking part and joining in dialogue	as a learner that feels that he or she is taking part and is part of a rewarding dialogue is assumed to participate more actively than a learner who does not.		Vonderwe ll and Zachariah (2005)

APPROACHES FOR STUDYING ONLINE LEARNER PARTICIPATION

From the six levels of conceptions of online learner participation, Hrastinski (2008) suggested in his work that the most common type of communication in online learning is asynchronous communication based on his review of 36 papers. From there he suggested 7 unit of analysis for measuring participation of online learners. The 7 units are: (1) quantity of messages or unit, (2) message or unit quality, (3) learner perceptions, (4) message lengths, (5) system accesses or logins, (6) read messages, and (7) time spent. Most of the papers that had been reviewed by Hrastinski suggested mixed method on top of quantitative method and then qualitative method.

Quantity of messages or units is the most measured unit of analysis in research on online learners participation. Most studies reported the number of messages that are obtained from an e-learning forum. There are also research that divided the data from

logs into sub-categories to objectively evaluate them in describing the degree of the students' participation.

The second unit analyzes the message or unit quality, which is more of a qualitative nature. Previous research had commonly categorized each message or unit according to their own classification scheme which developed uniquely to every research (e.g., Lipponen et al., 2002).

The third is learner perceptions, which in most research utilized interview and survey as means of data collection. This unit analyzes both the students as participants and also the comments of the students from the e-learning forum.

Messages length is another unit that is measured in an online learning participation research. Hrastinski (2008) noted that previous research had reported this unit as word count or lines of information (e.g., Woods & Keeler, 2001; Masters & Oberprieler, 2004). It was also suggested that the analysis for this unit includes messages that were identified as productive and have substantive contributions.

The fifth unit is system accesses or logins where participation is measured by looking at how often students accessed the e-learning site and their activity logs.

Another unit of analysis that was suggested is read messages. Students are considered participating if they login to the e-learning system and interact by reading messages and giving their responses to them.

Next is time spent as a unit of analysis. This can be conducted by using surveys or log data to view the time spent interacting in the e-learning site. The time spent is then compared to the amount of activities the students are involved with such as posting comments, perceived reading and reflecting and viewing course content.

Concluding the review, Hrastinski (2008) identified that research approaches for studying online participation can range from simple frequency counts to learner perceptions. The approach adopted by researchers depends on the researcher themselves as well as their research objectives. There are of course benefits and

limitations associated with each of the identified conceptions and approaches. Participation in general can be defined as a complex phenomenon, where measuring participation could be much more difficult with the given conceptualizations. It is also at the same time possible to evaluate by measuring the suggested unit of analysis.

CONCLUSION

This paper examines MacKinnon's (2000) Categorical Codes for Online Messages which contains 10 specific interaction that can assist in categorizing students messages online. Hrastinski's (2009) conceptualization of participation and Hrastinski's (2008) six levels of participation were also described as to provide various approaches that underlie research on e-learning environments. There are more other schemes of evaluation for both interaction and participation as reviewed by Weltzer-Ward (2011) and Hrastinski (2008). It is hoped that this conceptual paper shed some light on the approaches in coding and analyzing online interaction research.

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EVALUATION OF ACADEMIC ADVISING STYLES IN MALAYSIAN HIGHER EDUCATION PUBLIC INSTITUTIONS

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ABSTRACT

The role of academic adviser is highly important in creating an intellectual community of skilled and knowledgeable workforce for the country. There is lack of literature on the preference of academic advising style among university students in Malaysia. This study evaluates the preference of academic advising style across Malaysian higher education institutions. For this purpose, students from three universities were randomly selected as respondents of the study. A questionnaire was adapted from the Academic Advising Inventory instruments to collect data. Data were analyzed using descriptive statistics. The results showed that the mean trend of prescriptive academic advice in three universities is at a low level. Meanwhile, the mean trend of development advice in the three universities is at a moderate level. Generally, students choose a style of development advice to be the most preferred academic advising. Based on these findings, implications and suggestions are given.

Keywords: Academic advising; prescriptive advising; development advising

INTRODUCTION

University lecturers play an important role in creating an intellectual community of skilled and knowledgeable workforce (Kementerian Pengajian Tinggi, 2011). In addition to delivering lectures, they perform other duties relating to teaching and learning activities, scholarship and service to the university, students and community (Universiti Teknologi Mara (UiTM), 2011). One important task that should be undertaken by the lecturer is to work as an academic advisor to a group of students (UiTM, 2011). Academic Advisor(AA) is an advisor role and function as a source of information regarding to curriculum and co-curriculum, university policies and administrative procedures as well as guiding students dealing with the problems of the development of academic, personal, career, and personal preparedness (Universiti Teknologi Malaysia (UTM), 2010). In another study Harrison (2009) argues that an effective AA plays an important role in the development of students, as guidance and good advice can help produce students into successful and lifelong learners.

BACKGROUND OF THE STUDY

Academic Advising is the assistance to guide, advice, and help students overcome the difficulties encountered in academic life. Academic advising program provide a comprehensive approach to facilitate the relationship between students and the AA outside the classroom environment, where students can receive tutoring and guidance and discuss various topics, courses, fields, and make an assessment with the AA (Upcraft *et al.*, 2005). AA required by the students during their stay at the university help students in various aspects such as adjustment, academic development, personal development, career development and so on (Ahmad, 2002; Ayob & Sulaiman, 2003; Hartati, 2006; Maria, 2006; Noriadah, 2013; Norlaili, 2002; Nur, 2005; Tuan

Baharom, 1997; Tuan Khairul, 2008; Wan Rafeah, 2008; Wan Zainura, 2008). Research reveals that AA plays a key role in helping students throughout their studies at the university there by maintaining students' motivation and preparedness for study (Bailey, Bauman, & Lata, 1998; Mayer, 2001; Pascarella & Terenzini, 2005; Tinto, 1993).

Studies show that informal interaction between the students and the AA builds up positive perceptions of students associated with the university environment, academic achievement, personal development, social integration, motivation, satisfaction, guidance and advice process as well as retention in education (Gordon *et al.*, 2000). The roles and responsibilities of the AA is to provide guidance regarding course registration for students and also to monitor the academic progress of students under their supervision (Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO), 2005; UTM, 2010; Universiti Teknikal Malaysia Melaka (UTeM), 2011; Universiti Putra Malaysia (UPM), 2012; Politeknik, 2012).

PRESCRIPTIVE AND DEVELOPMENTAL STYLE

Cookston (1972; 2009) argues that the prescriptive advice is based on authoritative relationship. In prescriptive advising, academic advisors serve as authoritative figures and teach students how to learn. Prescriptive approach is seen as the traditional relationship between academic advisor and students. The advisor provides instruction to students in matters related to registration, determination of major, and others (Guyton, & Fielstein, 1989). Students become inactive as only advisor is responsible for providing sound advice and counsel. The price is paid by the students and the blame will be on the AA in case of bad consequences of the advice (Crookston, 1972; 2009; Grites & Gordon, 2000). By using prescriptive advising, the AA tends to focus on the limitations and weaknesses of the students rather than focusing on the potential, abilities, capabilities, and benefits

available to them (Crookston, 1972; 2009). The AA considers students to be immature and not able to make the best decision for themselves in their lives (Crookston, 1972; 2009). A prescriptive advisor does not allow students to make their own choices towards but they are told what to do by their advisers (Appleby, 2001). In prescriptive style the advisor is considered more knowledgeable and skilled in providing the best academic advice (Crookston, 1972; 2009).

Development style allows AA and students to have the same opportunity to discuss and to make mutually agreed decisions (Crookston, 1994). The AA and students are able to address a wide range of options, discuss various alternatives. The guidance becomes more focused on the overall development of students. Advising on the development trend is premised on the theory of development (Frost, 1991), which emphasizes on student-centered advising. Developmental style advice requires that AA should extend support through mentoring relationships, in addition to the career and psychosocial students. AA indirectly involved in the development of knowledge, sharing of information, and provides support to students in achieving the set goals (Baker and Griffin, 2010). Thus, by allowing students to choose their own options will make them feel more contented with the career path that they have chosen and can instill interest in their learning process. In developmental advice, the AA will guide students to achieve desired results by studying the ability of students and guiding them in their development plans. This is one of the special features of developmental academic style (Crookston, 1972; 2009). In this model, students and AA work together to cooperate and are responsible in ensuring that students are able to graduate on time. This advising style shows that a meaningful learning process takes place between students and the AA. Until now, research related to academic advising style in the country is scanty. Hartati (2006) found that students in KUiTTHO tend to choose the developmental academic style rather than prescriptive academic style. However, this trend is at its infancy stage and needs further investigation to identify the

academic advising style mostly preferred by students in Malaysia.

PROBLEM STATEMENT

The role and function of AA is very important for the development and retention of students in the university until they graduate. Studies show that the level of student satisfaction with the role played by the AA is moderate (Noriadah, 2013). This shows that students are not fully satisfied with the role played by the AA. Noriadah (2013) also found that 26% of students did not meet with their AA within a year they were at university, 26.7% of students met only once, and 15.1% had only met twice in the same period. The question is why they do not meet the AA while the university has set up a certain rate. For example, at least three meetings are needed to be held in a semester at UTM (UTM, 2010), once a month at the Universiti Pertahanan Nasional Malaysia (UPNM), 2012) and from time to time at Kolej Universiti Teknologi Tun Hussien Onn Malaysia (KUiTTHO), 2005). The question is are there other factors such as compatibility, comfort, cohesion with AA, methods, techniques, styles that can affect their frequency of consultation to provide by their AA? Studies are needed to be conducted to find the answer to this question.

Each student is likely to require different approach in academic advising since students have diversity of interests, abilities, potential, personality, needs and educational background. Studies show that the sooner the students mature and have a better knowledge of university system, the less dependency on AA were needed (Creamer, 2000). Recognizing the crucial role of the AA, improvement in the system must be brought about from time to time so that the role of the AA is always relevant to the needs of students, especially from the aspect of the AA leadership. AA leadership style will help ensure the effectiveness of the interaction between AA and

students. Therefore, this study is designed to find answers to all the questions raised.

OBJECTIVES OF THE STUDY

The main objectives of this study are as follows:

1. To identify the level of prescriptive academic advising style preference among students across the university.
2. To identify the level of developmental academic advising style preference among students across the university.
3. To identify the academic advising style preference among student across the university.

METHODOLOGY

In this study, the academic advising style focuses on three critical components which review on the developmental academic advising style and prescriptive academic advising style. The first component is Personalizing Education based on how academic advising discusses issues related to the academic and personal matters of students. The second component is the academic decision-making related to how the AA focuses the process and responsibility for decision-making related to academic achievements of students. The third component is the course selection related to the determination of the required course sand college students planning schedule. These components will be used in this study in relation to the academic advising style preferred by students. The study uses descriptive method to investigate into the stated research problem.

RESEARCH SUBJECTS

The respondents of this study were full-time students in undergraduate program. They are still active in their studies at UTM, UTHM and UTeM. A total of 297 undergraduate students were randomly selected as respondents.

RESEARCH INSTRUMENT

The study uses a questionnaire consisting of two parts. Part A consists of the demographic data and Part B consists of the academic advising style. The questionnaire was adapted from Academic Advising Inventory (AAI) by Winston and Sandor (1984). This questionnaire consists of 14 items used to identify the preference of academic advising style among students. The investigation is related to the three main components that is Education Personalizing, Decision Making and Selecting Courses. Academic advising style questionnaire was adapted from the Academic Advising Inventory (AAI) by Winston and Sandor(1984). It has been frequently used in previous studies, (examples conducted by Hartati (2006) and Yarbrough (2010)). Hartati (2006) have examined the questionnaire and found that the reliability of the questionnaire were high at 0.7708.

STATISTICAL ANALYSIS

Demographic Information data (Questionnaire Part A) and Academic Advising Style data (Questionnaire Part B) were analyzed using descriptive statistical analysis (mean). The quantitative data were processed using Statistical Package for the Social Sciences program (SPSS ver. 20.0).

FINDINGS

The data obtained from the questionnaires were analyzed as in Table 1.

Table 1: The Student Advisor Public Institutions of Higher Education

STYLE	UTM (n=71)	UTHM (n=127)	UTeM (n=99)	AVERAGE TOTAL (n=297)
Prescriptive Style	11.56	12.65	11.01	11.85
Developmental Style	30.77	32.00	33.69	32.27
Preferences Style	Developmental Style	Developmental Style	Developmental Style	Developmental Style

Table 1 shows the mean value of the academic advising styles preferences among students across three universities. The mean values of prescriptive style from these three universities are at low levels with a mean value for UTeM, UTHM and UTM as 11.56, 12.65 and 11.01 respectively. Meanwhile, the mean values of developmental style of the three universities are moderate with a mean value for UTM, UTHM and UTeM as 30.77, 32.00 and 33.69 respectively. Overall, students from the three universities chose developmental academic advising style as a preferred choice of academic advising.

DISCUSSION

The findings of the study indicated that the selection for prescriptive academic advising style among students across three universities is at a low level. The mean values for developmental academic advising style preference at the three universities are at a moderate level. The study informs that developmental academic advising style is not the only preference among students. There are still students who choose a prescriptive academic advising style though at low levels. While developmental academic advising has a lot of support from practitioners and is said to be a more proper or appropriate (Crockett, 1985; Grites & Gordon, 2000; Gordon, 1994; Life, 1993), the style may not provide universal satisfaction among students (Motarella, Fritzsche & Cerabino, 2004; Smith, 2002).

The findings of this study are in consistent with the findings of the studies conducted by Crookston (2009) which state that the key to the success of academic advising is to undertake consultation with the developmental style while finding Fielstein, Scoles and Webb (1992) reported that not all students liked the development style of. A study by Hartati (2006) also found that students tend to choose the developmental style than a prescriptive one; however, this trend is only at a low level. This shows that there are still students who choose a prescriptive style mainly in decisions makings and selecting courses. Prescriptive style of advising receives less attention than the developmental style. Students feel that they are passive, confined and not free to make any decision. This is because AA perceives students as in active, unable to provide ideas, has no potential and has limited abilities. This statement is in line with the opinion of Crookston (1972), (2009), and Grites and Gordon (2000) states that by using a prescriptive academic advising style, academic advising tends to focus on the limitations and weaknesses of the students rather than focusing on the potential, abilities, capabilities, and specialties of the students.

Students do not choose the prescriptive academic advising style since this style tends to portray a formal relationship with the students. Communication between them is also limited; less intimate and advisors has less confidence on the students. Their discussion is focused only on matters related to academic (Crookston, 1972; 2009). Students who choose a prescriptive advising still need guidance and help from their academic advising in matters related to decision making in academic-related issues such as choosing appropriate courses of study. This is in line with Fielstein, Scoles and Webb (1992), who argue that the majority of students prefer the prescriptive advising style for activities related to course selection, schedule planning courses, registration procedures and requirements for the award.

Selection of developmental academic advising style is the top choice even at moderate levels for the three universities that students are more comfortable interacting and meeting with AA that practice developmental advising style. Most students preferred the developmental academic advising style since it gives them the freedom to decide their future (Appleby, 2001). In addition, the developmental academic advising style practiced by AA provides space for them to inter act more with their academic advisor in order to get the support and help they need. The decision of AA to use developmental academic advising method enables students to make all the choices in their education. This causes students to feel as though they have chosen their own path rather than on what they need to do. However, the AA still needs to provide information support, particularly related to matters other than academic, such as career and psychosocial. Thus, the AA is not directly involved in the development of knowledge, sharing of information, and support to the students (Baker &Griffin, 2010).

Students also choose the developmental academic advising style because it gives them the opportunity to share information and goals. Furthermore, students are also given no opportunities to develop their potentials, to show competence and motivation

to find out as much information as possible that can help them throughout their studies. This opinion was shared by Crookston (1972; 2009), which considers the student as a potential, responsible and able to leap even further. O' Banion (1994) also noted that the excel will lead students to explore their goals in life, developmental academic advising style, exploring vocational goals, selecting programs and courses that are appropriate and organizing their everyday schedules. Therefore, students who are opting for developmental academic advising style has as an ample space in obtaining information, and improving their skills and experience.

RECOMMENDATIONS

On the basis of its findings, this study provides the following recommendations. AA should be approachable, friendly, helpful, open-minded and devoted. In this way, students will be motivated to meet and discuss their problems with AA easily and comfortably. AA should also be psychologically mature and experienced in teaching, understanding and be knowledgeable about the academic system, sensitive to the existing support system, realize the importance of advising, openness, sensitive and empathetic about the students' problems and experienced in the administration. AA should be a good practitioner in engaging with students and have good knowledge of student's academic needs. AA should be familiar with students' personality and create a conducive and comfortable environment for interaction and be easily reachable in person, by telephone, e-mail and fax. The relationship between students and the AA should be based on mutual trust and both need to know the personal background of each other. The relationship between a student and the AA could increase the social and ethical development of students and improve student's intellectual success. AA should display closeness to students, acting as a good listener and respect and recognized the students' skills and document all advisory

activities whether done individually, in groups, in person or online.

CONCLUSION

Interaction between students and advisors is the foundation of promoting students' learning, helping in building their social and personal development. Therefore, it is essential that AA should be sensitive to changes in the environment to ensure that students can achieve their needs easily. Each student is likely to perceive events differently thus has different learning experiences. This fact must be considered by academic advisers when dealing with students. Last but not least, a good AA can apply either a prescriptive style or a developmental style when providing advising to students at the appropriate time based on the demand of the situation and needs of students.

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WORKING MEMORY IN CHILDREN WITH DOWN SYNDROME

Shaznee Iryana Yusoff & Yeo Kee Jiar

ABSTRACT

The Down Syndrome (DS) or Trisomy 21 is a common chromosome disorder which has an extra chromosome on the 21st pair resulted in impairments and limitations in developmental abilities and physical growth. Memory is one of the vital features of deficits in cognitive development in Down syndrome. Albeit being able to perceive information accurately they are impeded in their ability to interpret and use this information. Working memory refers to the capacity to store and manipulate information for brief period of time. It is a cognitive system required for various cognitive tasks. Short- term memory holds both verbal and visual information, only then would it shift it to the working memory that can control the information. The sample of this study consisted of forty 6-14 years old children and adolescents with Down syndrome who scores at or below the 15th centile on listening recall and backward digit recalls (two subtests from AWMA) within the Kuala Lumpur district. Prerequisite requirements (no physical and sensory impairment) were met. The Automated Working Memory Assessment (AWMA) that had been developed by Alloway is a cognitive- based measure of working memory is being used as a tool to assess the level of working memory in children and adolescents with Down syndrome. Result showed that children with Down syndrome achieved highest score in visuo- spatial working memory (M=69.9) followed by verbal working memory (M=68.5), verbal short term memory (M=66.62) and visuo- spatial short term memory (M=62.02).

Keywords: Down Syndrome, Working Memory, AWMA

1.1 INTRODUCTION

Down syndrome, characterized by cognitive impairment, a number of physical characteristics such as small chin, slanted eyes, poor muscle tone, and a flat nasal bridge, Mongoloid-like facial and multiple deformities. The Down Syndrome (DS) or Trisomy 21 is a common chromosome disorder which has an extra chromosome on the 21st pair resulted in impairments and limitations in developmental abilities and physical growth as compared to normal children. Roughly, 1 in 700 to 800 live births (Sherman et al., 2007; Centers for Disease Control & Prevention, 2006) in western countries showed the incidence of Down syndrome while the total number of worldwide is more than 200,000 cases per year (Christianson et al., 2006). A survey conducted in a Maternity Hospital, Kuala Lumpur showed that the incidence of Down syndrome was 1:959 live births. The incidence of this chromosome disorder within the three major ethnics in Malaysia is 1:987 in Malay, 1:940 in Chinese and 1:860 in Indian (Hoe et al., 1989). Most individuals with Down syndrome have an IQ ranging from mild (IQ 50-70) to moderate (IQ 35-50) (Naess et al., 2011) and they are believed to be slow learners. Since it is commonly associated with mental retardation, impairments in the growth of cognitive development are inevitable.

Memory is one of the core features of impairments in cognitive development in Down Syndrome. Albeit being able to perceive information accurately they are impeded in their ability to interpret and use this information. This is possible due to their impotence in operating their executive function, an attention control system responsible for manipulating information. Limitations in memory span especially in processing verbal information will result to a poor language and learning outcome (Byrne et al., 1995). Multiple deficits have been identified in short-term memory and the peripheral systems of articulatory rehearsal as well as central systems that direct the information processing seem to be deficit in

these individuals (Hulme and Mackenzie, 1992).

1.2 LITERATURE REVIEW

In this section, the term working memory is explained and overviews of past studies on working memory are discussed. Objective of this study is also included.

1.2.1 Working Memory

The term ‘working memory’ refers to the capacity to store and manipulate information for brief period of time. It provides a mental workspace that is used in many important activities in everyday life. Working memory is a pure measure of a child’s learning potential. It is not strongly influenced by the child’s prior experiences such as pre- school education or their socio-economic background (eg., maternal educational level), it tells us a child’s capacity to learn. Working memory is a cognitive system used for short-term storage and manipulation of information required for various cognitive tasks. Short- term memory holds both verbal and visual information, only then would it transfer it to the working memory which can manipulate information (Baddeley , 1992). This is due to the existence of the central executive (an attention control system) in working memory system that regulates and manipulates information.

Baddeley and Hitch (1974) introduced the renown working memory model which involves a central executive which is an attention control system responsible for manipulating information, a phonological loop for maintaining and rehearsing verbal information, and a visual-spatial sketchpad for storing visual-spatial information (see Baddeley and Logie, 1999, for a review). Baddeley then revised this model to include an episodic buffer, which is thought to be a multi-modal system that integrates memory across domains (visual, spatial, verbal, etc.) into scenes or episodes. Episodic buffer within working memory seems to play an

important part in the working memory system as Baddeley insisted on revising it. (Baddeley, 2000)

Possible impairment in the verbal component of working memory system had been shown in a number of studies of working memory in Down syndrome while visuo-spatial is found fairly unaffected (Hulme and Mackenzie, 1992; Jarold and Baddeley, 1997, 2001; Jarold, Baddeley and Hewes, 2000; Lanfranci, Cornoldi and Vianello, 2004; Wang and Bellugi, 1994). Moreover, Lanfranci et al. (2004) found that different scores increases on working memory tasks among children with Down syndrome and typically developing children matched on mental age as the tasks require more involvement of central executive. Previously, a similar finding was found by Vicari, Carlesimo and Caltagirone (1995). This prompt a hypothesis that both verbal and control (central executive) components in working memory are impaired. Conversely, verbal working memory deficit seems to be Down syndrome specific. It was reported that there is no verbal working memory deficit in individuals with William syndrome (Wang and Bellugi, 1994) or in Fragile X- syndrome (Lanfranci et al., 2009).

However, Jarold and Baddeley (1997); Marcell and Armstrong (1982), and Marcell, Harvey and Cothran (1988) showed that verbal working memory deficit does not draw a parallel with hearing difficulties and difficulties in articulation (Jarold, Baddeley and Hewes (2000), Marcell and Weeks (1988). According to Vianello (2006), overall verbal impairment is the key reason that can cause deficit in verbal working memory in individuals with Down syndrome.

1.2.1 Objectives

The main objective of this study is to find the level of working memory in children with Down syndrome.

1.3 METHOD

In this section, the subjects and the measures used for working memory assessment will be described.

1.3.1 Subjects

The sample of this study consisted of 6-14 years old children and adolescents with Down syndrome within the Kuala Lumpur district. Both gender, (male and female) were involved and prerequisite requirements (no physical and sensory impairment) were met. Later on, a total of 40 DS children and adolescents who scores at or below the 15th centile on listening recall and backward digit recall (two subtests from AWMA) (Holmes et al., 2009) were screened with from twelve schools within the Keramat region.

1.3.2 Measures

The Automated Working Memory Assessment, a cognitive- based measure of working memory is being used as a tool to assess the level of working memory in children and adolescents with Down syndrome. Developed by Alloway (2007), it is a computer- based assessment of working memory skills, with a user- friendly interface. This culture- fair tool provides a practical and convenient way for educational professionals to screen individuals for significant working memory problems. It is standardized for use with individuals from early childhood (4 years) to (adulthood (22 years). Three measures each of the verbal and visuo-spatial aspects of short-term memory and working memory were tapped by the AWMA. Subtests such as digit recall, word recall and non-words recall are being used to measure the verbal short- term memory. Subtests such as dot matrix and block recall are being used to measure the visuo- spatial short- term memory domain. On the other hand, the verbal and visuo- spatial working memory were measured using tasks involving simultaneous storage and processing of information. Subtests such as listening recall and backwards digit recall are being used to measure the verbal

working memory. Subtests such as odd one out, spatial recall and Mister X are being used to measure the visuo- spatial working memory. More complex tasks have been designed to measure the central executive aspect of working memory. Subtest such as counting recall where the participant counts the number of target items in each of a series of successive arrays and then recalls the totals for each array in the original sequence (Case, Kurland, and Goldberg, 1982).

1.4 RESULTS

In this section, descriptive statistics of student's gender and age are presented. Furthermore, the level of working memory in Down syndrome children is shown through the mean composite score of working memory. In order to calculate composite scores the standard scores of the subtests in each memory component are summed and then standardized. Standard scores are a way of describing an individual's performance with respect to the performance of others in the same age band.

1.4.1 Gender and Age

Table 1(a) Descriptive statistics of sample's gender

Table 1 Descriptive Statistics of student's gender

Gender		
	N	%
Male	24	60
Female	16	40
Total	40	100

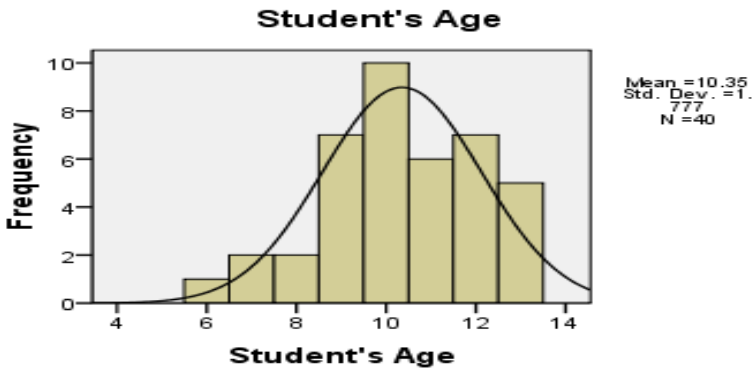


Figure 1 The frequency of student's age

Descriptive analysis of student's gender showed that there are 24 male students and only 16 female students had participated in this study. The mean age is 10.35 with a standard deviation of 1.777. The minimum age is 6 years old while the maximum age is 13 years old. Student of age 10 is the highest number of participant with a frequency of 10. There is only one student aged 6 years old.

1.4.2 Level of Working Memory

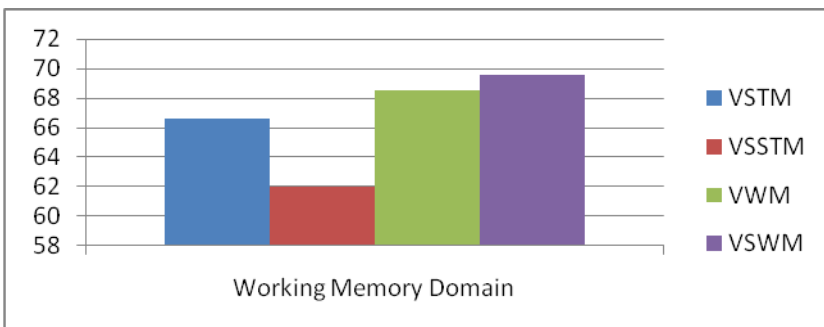


Figure 2 The mean score of working memory (composite score)

Figure 2 showed that children with Down syndrome achieved highest score in visuo- spatial working memory (VSWM) (M=69.9, SD=9.018) compared to other working memory domains, followed by verbal working memory (VWM) (M=68.5, SD=5.023), verbal short term memory (VSTM) (M=66.62, SD=5.714) and visuo- spatial short term memory (VSSTM) (M=62.02, SD=8.081).

1.5 DISCUSSION

This study showed the level of working memory in children with Down syndrome according to their domain respectively. The finding in this study is consistent with the previous studies, which said that the verbal component of working memory in Down Syndrome is more prone to be impaired rather than the visuo-spatial component of working memory. With the score of M=69.9, visuo- spatial working memory (VSWM) showed the highest mean score compared to other working memory domains.

Possible impairment in the verbal component of working memory system has been shown in a number of studies of working memory in Down syndrome while visuo-spatial is found fairly unaffected (Hulme and Mackenzie, 1992; Jarold and Baddeley, 1997, 2001; Jarold, Baddeley and Hewes, 2000; Lanfranci, Cornoldi and Vianello, 2004; Wang and Bellugi, 1994). However, Lanfranci et al. (2009) found that individuals with Down syndrome are poorer than controls in the spatial-simultaneous tasks (working memory), but not in the spatial-sequential tasks (short-term memory). In the mean time, verbal working memory deficit seems to be Down syndrome specific. It was reported that there is no verbal working memory deficit in individuals with William Syndrome (Wang and Bellugi, 1994) or in Fragile X- syndrome (Lanfranci and Vianello, 2009).

1.6 CONCLUSION AND FUTURE STUDY

In a nutshell, children with Down syndrome in this study showed the highest mean score in visuo- spatial working memory. For future study, an intervention program should be develop using this finding in order to increase the memory ability of children with Down syndrome.

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PERANAN GURU CEMERLANG DALAM MENINGKATKAN KOMPETENSI GURU LAIN DAN PRESTASI AKADEMIK SEKOLAH

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ABSTRAK

Kajian berbentuk kuantitatif dan kualitatif bertujuan untuk mengenal pasti peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain dan prestasi akademik sekolah rendah daerah Kota Tinggi. Kajian ini melibatkan 234 orang sampel daripada 15 buah sekolah rendah kebangsaan gred A yang mempunyai Guru Cemerlang. Data kuantitatif dikumpul melalui soal selidik dan telah dianalisis menggunakan perisian Statistical Package For Sosial Sciences (SPSS) versi 15.0. Analisis data mendapati peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain dan prestasi akademik sekolah berada pada tahap tinggi, dengan skor min 3.91 dan 3.89. Data kualitatif pula, dikumpul melalui temu bual ke atas 3 orang Guru Besar dan 4 orang Guru Cemerlang. Data kualitatif ini telah mendedahkan 5 cara Guru Besar menggunakan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain dan 6 cara meningkatkan prestasi akademik sekolah. Ia juga mendedahkan 4 masalah Guru Cemerlang dalam melaksanakan peranan ini di sekolah.

Kata Kunci: Peranan Guru Cemerlang

PENGENALAN

Guru Cemerlang telah dijadikan sebagai satu laluan kenaikan pangkat yang baru mulai tahun 1994, setelah Jemaah Menteri meluluskan memorandum bertajuk "Sistem Kenaikan Pangkat Dalam Perkhidmatan Pendidikan : Cadangan Ke Arah Meningkatkan Kualiti Perkhidmatan Pendidikan Dan Menghasilkan Guru Yang Cemerlang" pada tahun 1993 (Utusan Malaysia, 30 November 2006). Ianya bertujuan memberi peluang kepada guru-guru yang benar-benar cemerlang dan menyerlah di dalam mata pelajaran yang diajar atau bidang pengkhususan tertentu untuk menikmati peluang kenaikan pangkat tanpa perlu ditukarkan di jawatan pentadbiran. Melalui cara ini, guru-guru yang bermotivasi tinggi, mahir, berpengalaman dan pakar dalam bidang tertentu dapat terus dikekalkan untuk mengajar di sekolah bagi memperkasakan lagi proses pengajaran dan pembelajaran (Kementerian Pendidikan Malaysia, 2009).

Guru Cemerlang ialah guru yang mempunyai pengetahuan, kemahiran yang tinggi dalam dalam bidang pengajaran dan pembelajaran. Mereka juga seharusnya sentiasa berdedikasi dan bermotivasi dalam melaksanakan tugas dan tanggungjawab yang cemerlang secara berterusan (Kementerian Pelajaran Malaysia, 1998). Guru Cemerlang seorang guru yang istimewa, berdedikasi dan bermotivasi, mempunyai kemahiran dan kepakaran yang tinggi dalam tugasnya, hasil daripada himpunan pelbagai pengetahuan dan pengalaman yang luas dan berterusan pada sepanjang tempoh perkhidmatannya (Azizul Rahman & Mohamad Saleeh, 2007). Menurut Zainal (2004), kecemerlangan potensi Guru Cemerlang seharusnya dapat menyumbang tenaga dan kepakaran ke arah kejayaan sekolah. Kegagalan Guru Cemerlang menggalas tanggungjawab ini akan mengakibatkan penurunan dan kemerosotan prestasi akademik sekolah.

ISU DAN MASALAH GURU CEMERLANG

Kecemerlangan Guru Cemerlang sering dipertikaikan akhir-akhir ini, tidak semua Guru Cemerlang cemerlang seperti label yang diberi. Guru Cemerlang dari Kuala Lumpur dalam tulisannya yang bertajuk ‘Guru Cemerlang Wajar Muhasabah Diri, Usah Pertikai Beban Tugas’, bercerita mengenai pemerhatiannya terhadap Guru Cemerlang yang hanya memerah tenaga guru biasa. Sebagai contoh dalam program penyediaan modul, soalan dan bahan bantu belajar yang biasanya melibatkan semua guru iaitu Guru Cemerlang dan guru biasa. Walau bagaimanapun bahan tersebut akan dikumpulkan oleh Guru Cemerlang dan hasil tersebut dihebohkan sebagai hasil kerjanya. Malahan ada di antara Guru Cemerlang yang menggunakan bahan tersebut sebagai bahan bukti untuk memohon jawatan ke gred yang lebih tinggi (Berita Harian, 16 April 2011).

Tidak semua Guru Cemerlang juga dikatakan mempunyai ciri-ciri cemerlang bagi memenuhi lima aspek kecemerlangan seperti yang dikehendaki oleh Kementerian Pelajaran Malaysia. Menurut Md Nasir (2000), dalam penyelidikannya yang bertajuk ‘Guru Cemerlang : Personaliti dan Kemahiran’, lima aspek kecemerlangan tersebut ialah peribadi, pengetahuan dan kemahiran, komunikasi, potensi dan personaliti unggul. Dalam setiap aspek yang ditekankan terdapat ciri-ciri tertentu yang perlu dipenuhi. Namun daripada hasil penyelidikan yang telah dijalankan didapati aspek personaliti unggul yang mengandungi ciri-ciri seperti adil, sabar, tegas, konsep sendiri positif, kesungguhan, mesra, prihatin, kerjasama, menepati masa, bertanggungjawab, berakhlak mulia dan kecindan (unsur jenaka), tidak dapat dipenuhi sepenuhnya oleh Guru Cemerlang. Hanya 3 sahaja daripada ciri-ciri di atas iaitu tegas, menepati masa dan kecindan dimiliki oleh semua Guru Cemerlang yang ada di Malaysia hari ini.

Selain itu, peranan Guru Cemerlang di sekolah juga kurang menyerlah dan tidak terdapat perbezaan dengan guru biasa di sekolah. Hasil pemantauan yang dibuat oleh Penolong Pegawai

Pendidikan Daerah, Bahagian Matematik Sains Sekolah Rendah, Kota Tinggi ke atas 7 orang Guru Cemerlang sekolah menengah menunjukkan, kebanyakan mereka tidak membuat persediaan yang lengkap sebelum memulakan proses pengajaran dan pembelajaran. Ini terbukti semasa pemantauan dibuat, buku rekod mengajar tidak lengkap, tiada penggunaan bahan bantu belajar dan inovasi dalam pengajaran dan pembelajaran. Jelasnya, tiada terdapat perbezaan di antara Guru Cemerlang dengan guru biasa dalam pelaksanaan peranan dan tanggungjawab mereka di sekolah. Malahan ada di antara Guru Cemerlang yang dipantau menunjukkan prestasi yang lebih rendah daripada guru biasa (Kamalhuzaimi, Komunikasi Peribadi, 18 Mac 2013).

Shahila (2011) dalam kajiannya mengenai hubungan pengetahuan, kemahiran dan sikap Guru Cemerlang dengan kecemerlangan subjek, mendapati masalah ini timbul kerana Guru Cemerlang yang dilantik hari ini tidak mempunyai kemahiran kepimpinan, sikap dan ilmu pengetahuan untuk melaksanakan tugas dan peranan yang telah dipertanggungjawabkan. Guru Cemerlang bertanggungjawab melonjakkan kecemerlangan sekolah menerusi pengkongsian pengetahuan, pengalaman dan kemahiran di samping pembangunan modal insan yang seimbang dan menyeluruh. Kegagalan Guru Cemerlang mengalas tanggungjawab ini akan mengakibatkan penurunan dan kemerosotan prestasi sekolah. Sebagai contoh, pelaksanaan kurikulum yang dikelolakan oleh Guru Cemerlang sebagai ketua panitia mata pelajaran tidak dapat berfungsi dengan baik sehingga masih ramai pelajar yang gagal dalam mata pelajaran yang diajar (Berita Harian, 2010).

Masalah ini semakin serius apabila Guru Cemerlang hari ini sering diganggu oleh tugas-tugas pengkeranian sehingga mereka hilang fokus, masa dan tenaga yang sepatutnya ditumpukan kepada tugas sebenar iaitu pengajaran di dalam kelas. Inilah yang menimbulkan banyak rungutan apabila proses pengajaran dan pembelajaran terganggu, murid ketinggalan dalam akademik dan menimbulkan banyak masalah disiplin. Tugas pengkeranian ini bukan sahaja menyebabkan tumpuan kepada

bidang akademik terganggu, malah ia telah mengelabui mata pihak pentadbiran sekolah (Utusan Malaysia, 3 Disember 2009). Selain itu, beban tugas yang berlebihan ini menyebabkan Guru Cemerlang tidak mempunyai masa yang cukup untuk menjalankan tugas utama mereka. Kesannya, Guru Cemerlang yang sepatutnya bertindak sebagai ketua panitia tidak menjalankan aktiviti-aktiviti kepimpinan (Mohd Azizi, 1998). Masalah kekangan masa dan beban tugas yang bertambah banyak adalah penyebab utama aktiviti pengajaran tidak berjalan lancar.

Ini dibuktikan oleh Lokman (1998), dalam kajiannya mengenai persepsi guru terhadap tanggungjawab dan tingkahlaku kepimpinan guru kanan dan ketua panitia sebagai pemimpin pengajaran mendapati, ramai Guru Cemerlang yang terdiri daripada ketua bidang atau ketua panitia masih kabur dengan tanggungjawab serta peranan yang perlu dimainkan di sekolah. Begitu juga dengan dapatan kajian Marlina (2008) mendapati, ada segelintir Guru Cemerlang memang tidak memahami secara mendalam mengenai peranan dan tanggungjawab yang sepatutnya mereka laksanakan di sekolah. Terdapat juga Guru Cemerlang yang tidak mampu melaksanakan peranan dan tanggungjawab yang diamanahkan kerana kurangnya kemahiran dan pengetahuan yang diperlukan. Guru Cemerlang sepatutnya dapat melaksanakan tugas dan tanggungjawab mereka dengan mencapai kadar dan tahap yang cemerlang seperti diperincikan dalam Standard Kualiti Pendidikan Malaysia (SKPM), Kementerian Pelajaran Malaysia (Terma Rujukan Konsep Guru Cemerlang).

Cabaran Guru Cemerlang hari ini ialah melengkapkan diri dengan kemahiran dan sokongan bagi membolehkan mereka memberikan perkhidmatan terbaik dalam menghadapi persaingan global yang semakin sengit. Kualiti Guru Cemerlang dan mutu kepimpinan mereka di sekolah perlu dimantapkan. Lebih banyak usaha diperlukan bagi meningkatkan kemahiran pedagogi baru sedia ada untuk memastikan mereka dapat menyampaikan pengetahuan dan kemahiran baharu yang dihasratkan (Pelan Pembangunan Pendidikan Malaysia 2013-2015). Guru Cemerlang

perlu sedar bahawa matlamat Kementerian Pelajaran Malaysia mewujudkan jawatan Guru Cemerlang antaranya adalah untuk meningkatkan kewibawaan dan kecemerlangan guru. Guru Cemerlang mesti boleh menjadi contoh terbaik supaya budaya kecemerlangan dapat dicontohi dan diamalkan oleh semua guru (Kementerian Pelajaran Malaysia, 2007).

Berdasarkan isu-isu inilah, pengkaji berminat untuk mengkaji sejauh mana kebenaran kenyataan-kenyataan yang diberi. Pengkaji berminat untuk melihat peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain dan prestasi akademik sekolah serta masalah-masalah yang dihadapi oleh Guru Cemerlang semasa mereka melaksanakan peranan ini di sekolah.

OBJEKTIF KAJIAN

Melalui isu dan masalah yang dibincangkan, secara lebih terperinci objektif kajian ini adalah untuk mendapat maklumat mengenai perkara-perkara berikut:

- 3.1 Mengenalpasti tahap peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain di sekolah.
- 3.2 Mengenalpasti tahap peranan Guru Cemerlang dalam meningkatkan prestasi akademik sekolah.
- 3.3 Mengenalpasti cara pihak pengurusan sekolah menggunakan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain di sekolah.
- 3.4 Mengenalpasti cara pihak pengurusan sekolah menggunakan kepakaran Guru Cemerlang dalam meningkatkan prestasi akademik sekolah.
- 3.5 Mengenalpasti masalah-masalah yang dihadapi oleh Guru Cemerlang dalam melaksanakan peranan mereka untuk meningkatkan kompetensi guru lain dan prestasi akademik sekolah.

METODOLOGI

Kajian ini menggunakan pendekatan secara kuantitatif dan kualitatif. Pendekatan secara kuantitatif digunakan bagi mengenalpasti tahap peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain di sekolah dan tahap peranan Guru Cemerlang dalam meningkatkan prestasi akademik sekolah menggunakan rekabentuk tinjauan. Bagi tujuan ini, data dikutip menggunakan soal selidik yang dibina berdasarkan peranan dan tanggungjawab Guru Cemerlang seperti yang diperincikan dalam Standard Kualiti Pendidikan Malaysia (SKPM) serta gabungan temu bual dengan beberapa orang guru biasa dan Guru Besar serta Guru Cemerlang sendiri. Berdasarkan kajian rintis dan pengubahsuaian item yang dijalankan, soal selidik yang dibina ini mempunyai nilai *Alpha Cronbach* 0.896 bagi dimensi peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain dan 0.889 bagi dimensi peranan Guru Cemerlang dalam meningkatkan prestasi sekolah. Berdasarkan Jadual Peningkatan Kedudukan Item Berdasarkan Nilai *Alpha Cronbach* oleh Mohd Najib (2003), soal selidik ini dianggap mempunyai ketekalan yang tinggi dan sesuai untuk digunakan dalam kajian ini.

Populasi yang terlibat dalam rekabentuk kajian ini adalah seramai 614 orang guru penolong dari 15 buah sekolah rendah gred A di Kota Tinggi yang mempunyai Guru Cemerlang di sekolah mereka. Daripada populasi tersebut, 234 orang dipilih sebagai sampel kajian. Persampelan rawak mudah menggunakan perisian '*Random Number Generator*' dibuat supaya semua responden mempunyai peluang yang sama untuk dipilih. Sebanyak 234 set soal selidik telah diedarkan kepada responden. Semua borang soal selidik yang diedar telah dapat dikumpulkan semula. Data dianalisis menggunakan perisian *Statistical Package For Sosial Science* (SPSS) 15.0 bagi mengetahui min, kekerapan dan peratusan setiap item.

Pendekatan secara kualitatif pula dijalankan secara temu bual. Reka bentuk kajian sedemikian digunakan untuk mendapatkan data tentang cara pihak pengurusan sekolah

menggunakan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain dan prestasi akademik sekolah serta masalah-masalah yang dihadapi oleh Guru Cemerlang semasa melaksanakan peranan mereka di sekolah. Bagi tujuan tersebut, tiga orang Guru Besar dan empat orang Guru Cemerlang dari kalangan sekolah yang sama telah dijadikan sampel.

Bagi analisis data secara kualitatif, proses pengutipan dan penganalisan data berjalan serentak. Analisis data dilakukan sebaik sahaja temu bual dengan responden selesai. Penganalisan data terhadap transkrip temu bual mengambil kira setiap jawapan dan pandangan yang diberi oleh responden, meliputi pendapat dan cadangan mengenai peranan Guru Cemerlang serta masalah yang dihadapi dalam pelaksanaannya.

KETEKALAN INSTRUMEN SOAL SELIDIK BAGI MENGUKUR PERANAN GURU CEMERLANG DALAM MENINGKATKAN KOMPETENSI GURU LAIN DAN PRESTASI AKADEMIK SEKOLAH

Soal selidik yang digunakan telah diubah suai daripada peranan dan tanggungjawab Guru Cemerlang seperti yang diperincikan dalam Standard Kualiti Pendidikan Malaysia (SKPM) dan gabungan temu bual dengan beberapa orang guru biasa dan Guru Besar dari sekolah yang mempunyai Guru Cemerlang serta Guru Cemerlang sendiri. Kajian rintis dibuat untuk memastikan penyelidikan memenuhi objektif kajian (Sulaiman, 2005). Pengkaji memberikan soal selidik kepada sekumpulan responden seramai 20 orang tetapi mempunyai ciri yang sama dengan populasi sebenar daripada sekolah pengkaji sendiri untuk menentukan kesesuaian soal selidik dengan kajian yang hendak dibuat. Bagi menentukan tahap keesahan soal selidik, pengkaji membincangkan setiap item yang dikemukakan kepada semua responden. Item-item yang menghadapi masalah untuk difahami, samar dan kurang jelas, diubah suai semula dengan menggunakan struktur ayat yang lebih mudah difahami oleh responden. Ujian statistik *Alpha Cronbach*

dengan perisian SPSS digunakan oleh pengkaji untuk menguji skala kebolehpercayaan instrumen kajian yang telah dikumpulkan. Walau bagaimanapun, terdapat beberapa item yang menunjukkan indeks *Alpha Cronbach If Item Deleted* yang tinggi. Penambahbaikan dibuat pada bilangan dan bahagian item soalan. Kajian rintis telah dijalankan sekali lagi pada kumpulan responden yang sama. Penyelidik sekali lagi menggunakan ujian statistik *Alpha Cronbach* dengan perisian SPSS untuk mengkaji skala kebolehpercayaan instrumen kajian kedua ini. Menurut Mohd Najib (2003), ujian kebolehpercayaan *Alpha Cronbach* dalam SPSS digunakan bagi mengukur kebolehpercayaan item soal selidik dengan menggunakan kriteria berdasarkan nilai indeks adalah 0 hingga 1. Nilai hampir dengan 0 bermakna tahap ketidakbolehpercayaan sangat rendah, manakala jika nilainya hampir kepada 1 pula tahap kepercayaannya sangat tinggi, jawapan yang diberi tidak perlu diragui dan boleh dipercayai seratus peratus. Nilai 0.8 di dapati boleh diterima sebagai tahap kebolehpercayaan yang sederhana, jawapan yang diterima boleh dipercayai dan boleh diragui.

TAHAP PERANAN GURU CEMERLANG DALAM MENINGKATKAN KOMPETENSI GURU LAIN YANG DIUKUR MENGGUNAKAN INSTRUMEN YANG DIBINA

Dapatan kajian dalam *Jadual 1*, menunjukkan tahap peranan Guru Cemerlang dalam meningkatkan kompetensi guru lain di sekolah adalah tinggi dengan skor min keseluruhan iaitu 3.91. Guru-guru bersetuju bahawa Guru Cemerlang sememangnya menjadi mentor, pembimbing, penyampai mesej dan idea serta meningkatkan kemahiran dan motivasi guru-guru lain di sekolah. Ianya bersesuaian dengan peranan Guru Cemerlang seperti yang diperincikan dalam Standard Kualiti Pendidikan Malaysia (SKPM).

Jadual 1: Tahap Peranan Guru Cemerlang Dalam Meningkatkan Kompetensi Guru Lain Di Sekolah Berdasarkan Min Dan Sisihan Piawai

Perkara	Min (M)	Sisihan Piawai (SP)	Tahap
Menjadi mentor kepada guru dalam aspek pengajaran	3.89	1.04	Tinggi
Memberi maklum balas kepada guru yang dibimbing tentang kemajuan pengajaran	3.80	1.00	Tinggi
Memberi bimbingan dalam aspek pengajaran kepada guru yang memerlukan	3.91	1.00	Tinggi
Berkemampuan menyampaikan mesej dan idea untuk menambahbaik pengajaran guru	3.99	0.88	Tinggi
Membantu guru meningkatkan kemahiran dalam membimbing murid yang lemah	3.94	0.98	Tinggi
Membantu meningkatkan motivasi guru dalam melaksanakan pengajaran	3.91	1.01	Tinggi
Keseluruhan	3.91	0.91	Tinggi

TAHAP PERANAN GURU CEMERLANG DALAM MENINGKATKAN PRESTASI AKADEMIK SEKOLAH YANG DIUKUR MENGGUNAKAN INSTRUMEN YANG DIBINA

Tahap peranan Guru Cemerlang dalam meningkatkan prestasi akademik sekolah juga berada pada tahap tinggi iaitu dengan skor min keseluruhan 3.89 seperti dalam *Jadual 2*. Ini menunjukkan guru-guru bersetuju bahawa Guru Cemerlang sememangnya berperanan penting dalam meningkatkan prestasi akademik sekolah melalui pengenalan kaedah pengajaran yang kreatif, inovatif, menarik dan berkesan untuk digunakan bersama, penyediaan rancangan strategik, menjadi ketua panitia yang aktif dan menjadi fasilitator untuk program-program peningkatan prestasi akademik sekolah.

Jadual 2: Tahap Peranan Guru Cemerlang Dalam Meningkatkan Prestasi Akademik Sekolah Berdasarkan Min Dan Sisihan Piawai

Perkara	Min (M)	Sisihan Piawai (SP)	Tahap
Memperkenalkan kaedah pengajaran yang kreatif, inovatif, menarik dan berkesan	3.97	1.0	Tinggi
Menyediakan rancangan strategik bagi meningkatkan prestasi mata pelajaran	3.96	0.97	Tinggi
Memantau guru dalam melaksanakan program peningkatan	3.55	1.09	Sederhana

prestasi akademik			
Menjadi ketua panitia yang aktif dalam mata pelajaran kepakaran	3.94	1.00	Tinggi
Menjadi fasilitator dalam program peningkatan prestasi sekolah	4.06	0.98	Tinggi
Menyelaras program pengayaan dan pemulihan yang dilakukan oleh guru	3.86	1.06	Tinggi
Keseluruhan	3.89	0.92	Tinggi

CARA PIHAK PENGURUSAN SEKOLAH MENGGUNAKAN KEPAKARAN GURU CEMERLANG DALAM MENINGKATKAN KOMPETENSI GURU LAIN

Berdasarkan data transkripsi kualitatif yang telah dianalisis secara manual *Jadual 3* menunjukkan, terdapat lima cara pihak pengurusan sekolah iaitu Guru Besar menggunakan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain di sekolah. Ianya adalah dengan menjadikan Guru Cemerlang sebagai: (1) contoh kepada guru lain; (2) ahli dalam kumpulan pentadbiran; (3) fasilitator perkongsian ilmu; (4) pencetus motivasi; (5) pembimbing rakan guru. Secara keseluruhannya, cara Guru Besar menggunakan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain adalah hampir sama.

Jadual 3: Cara Guru Besar Menggunakan Kepakaran Guru Cemerlang Dalam Meningkatkan Kompetensi Guru Lain

Bil	Cara Guru Besar Menggunakan Kepakaran Guru Cemerlang Dalam Meningkatkan Kompetensi Guru Lain	Guru Besar 1	Guru Besar 2	Guru Besar 3
1	Menjadikan Guru Cemerlang contoh atau <i>role model</i>	/	/	/
2	Menjadikan Guru Cemerlang sebahagian daripada ahli dalam kumpulan pentadbiran		/	
3	Menjadikan Guru Cemerlang pembantu kepada guru lain melalui perkongsian idea dalam pengajaran dan pembelajaran		/	/
4	Menjadikan Guru Cemerlang pemberi motivasi		/	/
5	Menjadikan Guru Cemerlang pembimbing	/	/	/

CARA PIHAK PENGURUSAN SEKOLAH MENGUNAKAN KEPAKARAN GURU CEMERLANG DALAM MENINGKATKAN PRESTASI AKADEMIK SEKOLAH

Data transkripsi kualitatif yang telah dianalisis dalam *Jadual 4* juga menunjukkan, terdapat enam cara telah digunakan oleh pihak pengurusan sekolah iaitu Guru Besar dalam meningkatkan prestasi akademik sekolah, iaitu : (1) merancang rancangan strategik; (2) menjadi ketua panitia; (3) menjalankan pemantauan pengajaran dan pembelajaran guru; (4) memperkenalkan kaedah pengajaran yang menarik dan berkesan; (5) menjadi fasilitator untuk program-program kecemerlangan dan (6) membantu dan membimbing murid-murid yang lemah.

Jadual 4: Cara Guru Besar Menggunakan Kepekaran Guru Cemerlang Dalam Meningkatkan Prestasi Akademik Sekolah

Bil	Cara Guru Besar Menggunakan Kepekaran Guru Cemerlang Dalam Meningkatkan Prestasi Akademik Sekolah	Guru Besar 1	Guru Besar 2	Guru Besar 3
1	Menjadikan Guru Cemerlang perancang dan pelaksana rancangan strategik untuk peningkatan sahsiah, prestasi akademik dan pemulihan murid	/	/	/
2	Menjadikan Guru Cemerlang ketua	/	/	

	panitia yang aktif			
3	Menjadikan Guru Cemerlang pemantau pengajaran dan pembelajaran guru lain		/	

MASALAH YANG DIHADAPI GURU CEMERLANG DALAM MELAKSANAKAN PERANAN UNTUK MENINGKATKAN KOMPETENSI GURU LAIN DAN PRESTASI AKADEMIK SEKOLAH

Berdasarkan data transkripsi kualitatif yang telah dianalisis *Jadual 5* menunjukkan, terdapat empat masalah utama yang dihadapi oleh Guru Cemerlang dalam melaksanakan peranan dalam meningkatkan kompetensi guru lain dan prestasi akademik sekolah. Ianya ialah : (1) beban tugas Guru Cemerlang semakin bertambah; (2) jumlah masa mengajar yang banyak; (3) sukar mendapat kerjasama guru-guru lain dan (4) pentadbir pilih kasih dan tidak percaya kepada kemampuan Guru Cemerlang.

Jadual 5: Masalah Yang Dihadapi Oleh Guru Cemerlang Dalam Melaksanakan Peranan Untuk Meningkatkan Kompetensi Guru Lain Dan Prestasi Akademik Sekolah

Bil	Cara Guru Besar Menggunakan Kepakaran Guru Cemerlang Dalam Meningkatkan Prestasi Akademik Sekolah	G C 1	GC 2	GC 3	G C 4
1	Beban tugas dan tanggungjawab Guru	/	/	/	/

	Cemerlang di sekolah semakin bertambah				
2	Guru Cemerlang sukar mendapat kepercayaan, kerjasama dan sokongan guru-guru lain	/	/	/	/
3	Guru Cemerlang berdepan dengan sikap negatif murid dan ibu bapa			/	/

KESIMPULAN

Berdasarkan kajian yang dijalankan secara keseluruhannya didapati guru-guru bersetuju bahawa Guru Cemerlang berperanan dalam meningkatkan kompetensi guru lain berjalan di sekolah dalam pengajaran melalui pementoran, bimbingan, perkongsian idea, penambahbaikan peningkatan kemahiran serta motivasi. Selain itu, guru-guru juga bersetuju bahawa Guru Cemerlang telah memperkenalkan kaedah pengajaran yang kreatif, inovatif, menarik dan berkesan, menyediakan rancangan strategik, menjadi ketua panitia yang aktif dan fasilitator dalam program-program kecemerlangan untuk meningkatkan prestasi akademik sekolah. Dapatan kajian secara kuantitatif ini disokong oleh dapatan secara kualitatif yang mendapati bahawa Guru Besar selaku pihak pentadbiran sekolah telah menggunakan 5 cara untuk mendapatkan kepakaran Guru Cemerlang dalam meningkatkan kompetensi guru lain dan 6 cara lain dalam mendapatkan kepakaran Guru Cemerlang dalam meningkatkan dan prestasi akademik sekolah. Melalui kajian ini juga didapati Guru Cemerlang berdepan 4 halangan utama dalam melaksanakan peranan untuk meningkatkan kompetensi guru lain dan prestasi akademik sekolah.

Dapatan-dapatan kajian ini didapati berbeza dengan beberapa isu yang mendedahkan kelemahan dan masalah berkaitan guru Cemerlang seperti kemerosotan pencapaian akademik murid,

aspek kecemerlangan, kualiti pengajaran dan integriti mereka pada awal kajian. Pada hari ini, penilaian terhadap Guru Cemerlang adalah tertakluk kepada instrumen yang digunakan dan budi bicara pihak pentadbiran sekolah, Jemaah Nazir Sekolah (JNS), pegawai dari Pejabat Pendidikan Daerah (PPD) dan Pejabat Pendidikan Negeri (JPN) serta Kementerian Pelajaran Malaysia (KPM).Ketiadaan sebuah indikator kecemerlangan Guru Cemerlang menyukarkan pihak pentadbiran sekolah untuk membuat penilaian sebenar Guru Cemerlang di sekolah (Rohayu, 2003).Oleh itu, satu kajian lebih mendalam perlu dijalankan untuk membangunkan indikator kecemerlangan Guru Cemerlang yang boleh diguna pakai oleh semua pihak secara selaras dan telus dalam menilai kualiti kecemerlangan Guru Cemerlang.

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A REVIEW OF SCHOOL IMPROVEMENT PROGRAMME IN EXPEDITING MALAYSIAN EDUCATIONAL SYSTEM REFORMS

Noriadah Abdul Karim & Amirmudin Udin

ABSTRACT

This paper examines the school improvement programme and its role in enhancing the delivery of education system in Malaysia. More specifically, the paper evaluated the implementation efforts and the challenges faced regarding the School improvement programmes. Although school improvement efforts have long traditions in Malaysia and over the years many educational reform plans for school development have been designed and implemented. Yet, there are mixed reactions regarding the success of these reforms and school improvement programmes. Previously, many studies have examined the impact of these programmes on schools, student development and academic achievement and so on. However, these studies have provided little information about the efforts and challenges on the implementation of the school improvement programmes in Malaysia. Hence, the main aims of this paper were: to investigate into the efforts and challenges and to provide some suggestions as to how these challenges could be overcome. To achieve these objectives, the paper carried out a surgical dissection of the current literature on the school improvement plan, its efforts and the challenges in Malaysia. The critical investigation into the existing literature on different aspects of the school improvement programme, implementation efforts and

the challenges showed that although regarding school improvement plan in Malaysia, some progress has been achieved in the areas like, development of academic standards for quality teaching and learning materials, preparing competent teachers, engineering an integrative and quality curriculum and assessment procedures, ensuring the implementation procedures and a using school principals as key academic leader. However, despite of this much work still remains to be done. To promote the goals of school improvement programme in Malaysia, this paper provides the insight that there is a need to develop strong links between teachers, community, heads, students and the world of work. This association will lay the foundation for successful school development in Malaysia.

Keywords: School Improvement Program, Malaysian education, System reforms

INTRODUCTION

Education plays an essential role in the preservation, development and continuation of human civilization. It is the foundation of moral regeneration and revival of the people which later can create a dynamic platform to rejuvenate and breathe new life that lays the foundation of a more self-aware and conscientious society (Hallinger, 2003). The economic and social development of the society is possible and sustainable if the education system becomes the major driving force for developmental acceleration. Improving the quality of human development, agents of educational change must be identified and schools are rightly decided upon as hubs where knowledge is disseminated to the masses (Mok, 2006). Consequently, modernization of school system to bring in these positive changes is considered integral to ensure the transition in rural areas happen seamlessly and this has been proven to be the case whenever constructive changes are made, in line with the aspirations of a nation (Ahmad *et al*, 1999).

Education expedites nation building for it is the driving force to revolutionize industries and provide a dynamic platform to rejuvenate and breathe new life into the changes needed to create a more self-aware and conscientious society. Economic and social development of a country is possible and sustainable in the long run if the education system becomes the main driving force for developmental acceleration. For the improvement of the quality of human development, it is necessary that agents of educational change must be identified (Zailani *et al*, 2007).

Over the last many decades, Malaysia had seen many changes in school system. Schools are being more accountable than ever before and many changes taken place in many forms. Stakeholder, administrator, teachers, students and parents have the responsibility to prove that students' learning is taking place effectively (Lee, 2000). Reformation in school system consists of creating greater coherence of instructional guidance policies that will create large number of effective school. As a result, schools are developed to be better places for learning. This relies on changes at both school level and within classrooms, which in turn depends on schools being committed to fulfilling the expectations of children and their parents (Ahmad *et al*, 1999; Brown, 2007).

Schools are considered as hubs where knowledge is disseminated to the masses. As such, schools must be held accountable for the different outcomes they churn out on a yearly basis, be it the changes of improving students' achievements or the imminent impact education. School reforms offer schools more effective strategies to ensure success for all students.

The main idea behind community schools was that the school must hold a central place in the community in order to provide the desired educational service to the community and the education of children needs to be linked to that of the grownups. In this perspective, the content of school programmes should be based on the real needs of the community (Coles and Southworth, 2004). A school with a focused vision shows enthusiasm for the school improvement process. A focused school, through their vision examines research-based factors related to student

performance, determined beliefs, develops a shared vision to focus improvement, and determines expectations for student learning.. For this purpose, a centralized data collection system and self-help tool called School Improvement Toolkit (SIT) has been launched to boost up the school performance (Lee *et al*, 1992).

A school with a focused vision shows enthusiasm for the school improvement process. A focused school, through their vision examines research-based factors related to student performance, determined beliefs, develops a shared vision to focus improvement, and determines expectations for student learning. This focused vision is shared commonly with all stakeholders of the school district and state (Hallinger & Kantamara, 2001; Lee, 2000). Beside, Fuhrman (2001) stated that the important policies of standard based reform are professional development, pre service development, student assessments and accountability, school site autonomy and restructuring, and supportive services districts and states.

Malaysia made a bold stride forward in education ambitions by putting in place a 12 years programme (year 2012 to 2025), with the launch of the Malaysian Education Blueprint (MEB) on 2012. The blueprint is designed to place the Malaysian education system on equal footing with the best in the world by 2025. The MEB aspires to address the concerns over the deficiencies in the present education system to prepare the students to compete in the current highly competitive, fast and knowledge based job market. Furthermore, the initiatives of the Education National Key Result Area (NKRA), which is a subset of the MEB, aims to enhance students learning experience and equality by striving towards a comprehensive transformation on the current institution to involve schools, teachers and principals (Bajunid, 2000; Lee, 2000).

The Education National Key Results Area (EDU NKRA) was established to be a catalyst for the country's future by developing the minds, talents and capabilities of the next generation in a more universal manner. In 2011, EDU NKRA has moved ahead in introducing some more initiatives in improving

students' outcomes such as continued support in terms of pre-school agencies and operators, Literacy and Numeracy Screening (LINUS), Identifying more High Performance Schools (HPS), Introducing New Deals for Principals and Head teachers and Enhancing the all school systems through School Improvement Programme. Those initiatives are crucial components to ensure that Malaysia reaches its goal of becoming high- income nation.

School Improvement Programme (SIP) is a comprehensive effort to transform every school, especially underperforming schools into excellent educational institutions by challenging and lending them support. School improvement also refers to a systematic approach that improves the quality of schools which is a plan-initiated education program based on long experiences of supporting basic education in the developing world. Its aims are to ensure support to every aspect of a school essential in creating the best learning environment for children, to promote the active participation of children and communities in school governance, to hold the individual school management accountable for children's enrolment, attendance, learning and successful completion (Cheng, 2002).

SIP is considered one of the most powerful tools to improve the quality of education and recognized all over the world, particularly in teaching and learning processes (Begum and Khan, 2012). Many reforms have been implemented to increase access and improve the quality of education such as Early Childhood Education, Education for all, No Child Left Behind SIP addresses all of the above for it involves the modernization of school systems using a top-down approach, changing whole schools by garnering active participation of all ages and levels as well as improving instructional processes which encompass a comprehensive array of organized factors such as programmes, teaching methods, school management, leadership, professional development of teachers, research and findings, parental involvement, monitoring and evaluation (Sua, 2012)

Besides, School improvement is the continuous process of establishing vision and purpose for each district and subsequently

improving areas of need in student achievement. While the SIP supports all 10, 000 schools in the Malaysian schooling system, this programme focuses on low performing school nationwide, especially in rural areas can be supported financially and academically to produce the desired results. Lee (1992) stated that the systematic school improvement process serves as a means to improve student results.

The infrastructure for the school based reforms consists of the challenging academic contents, standards, student and faculty performance standards, assessment system and a reward and punishment based approaches to control system implementation for achieving the desired results. These processes ranges from the fundamentally grassroots, site-based model of reform to the more closed down low-performing schools for their reopening with new school leaders, teachers, and staff. The main goals of the school improvement are: (a) to improve the students' academic outcomes and (b) to encourage a high-quality, robust, standard-based classroom instruction procedures with the aim to develop the higher-order performance and cognitive skills of the learners (Hallinger, 2005; Cheng, 2003).

The successes of the School Improvement Programme (SIP) from the Government Transformation Programme 1.0 (GTP 1.0) revealed the importance of targeting weaker schools and helped improve them through a coordinated effort. This initiative continued in GTP 2.0 and further expanded under the rubric of the District Transformation Programme (DTP). This programme will see District Education Offices (PPDs) fundamentally transformed by granting them powers and authority to support schools within their jurisdiction. PPDs had a review process, analysis, designs and implements a plan to help the school improve. Many states and districts have support system for low performing school.

Principal is one of the important elements in School Improvement Programme (Simkins *et al*, 2003). Principals provide an academic leadership and direction to the overall academic activities in school. Leadership is a social process involving complex relationship with multiple and evolving influences to

influence followers to move in a desired direction (Hallinger, & Leithwood, 1994). In the school improvement programme, the school principals were recommended to regenerate school systems by resetting directions, redeveloping its people, redesigning their organizations and managing their instructional programmes for organizational transformation. Therefore, as instructional leaders in leading curricular instruction in school and change facilitators, school principals should be idealized influence, inspirational motivation, intellectual stimulation and individualized consideration (Hallinger, 2003).

One of the essential roles of school principal is providing guidance for bringing about the desired change or transformation in the school (Coles, & Southworth, 2004). The transformational entities should include facilitating instruction, accountability, establishing communication and rapport and managing change (Sharma, 2010). Besides, providing support and working as a coach, principal also works to build the capacities and competencies of teachers and provides them accessibility to teaching and learning content, encouraging innovative and creative environment, selecting active pedagogies and creating communities of learners (Lee, 1992). Although this is a challenging task, however, there are some examples of low performing schools. This happens when the schools have strong leaders, active participation in the entire school activities such as, parental involvement, teachers' matters, administration, school boards, teacher unions and students' improvement. For this purpose, principal normally need support from all the stakeholders for the school improvement plan (Hallinger, & Leithwood, 1994). Principals are the key players in the school improvement process. They play a wide variety of roles to ensure that the improvement plan and its implementation are successful. One of their most important responsibilities is to ensure that improvement plans reflect the characteristics of their own school and its community (Hallinger, 2010; Cheng, 2003).

SCHOOL IMPROVEMENT EFFORTS

Malaysia has made much development in education in the last fifty years (Ahmad *et al*, 1999). The literacy rate is more than 92 percent. Malaysia is enlisted among those developing countries who have achieved universal primary education and a fastest growth in the secondary school enrollment. Despite of this research shows that the Malaysian students still poorly perform as compared to Hong Kong, South Korea and Singapore. The gap is rapidly widening (Mahyuddin *et al*, 2004). The long lasting goals of Malaysian education system are improvement of student outcomes and having access to quality. The main reason behind this goal is to develop a competitive workforce to help Malaysia to get the developed country status 2020. There is a direct relationship between quality of education and quality of life (Ming *et al*, 2010).

Quality education is seen as a basis for ensuring the quality of life. Improvement of students' outcome is contingent upon the educational standards. As a part of the efforts of school improvement programme, the following main goals have been focused by the educational managers since the 2020 target was set. To transform the educational system, (Lee, 1999) suggests a broader system of plans and procedures has been formulated to:

- ensure that each child should be able to succeed in life,
- increase 87% of the pre-school enrollment of 4+ and 5+ children,
- ensure that all children have basic literacy and basic numeracy after three years of primary school,
- get school accountable for developing schools
- put in place performance based school systems,
- increase attraction of teaching profession and enhance quality of training and instruction at all levels,
- recruit talented teachers, and
- introduce regular performance management systems and continual professional development.

Writers have advised that to achieve the above set goals, many

areas have identified as part of the efforts of school improvement plan and to strengthen the delivery of the high quality education, the following measures have been undertaken. First, a national committee on pre-education has been established to govern the set activities. The main aim of these efforts is to develop pre-school policies. This includes curriculum, qualifications, requirements, training and evaluation of the teaching and learning process for determining future policy directions. Second, to other one is developing collaborations with the private sector to enhance opportunities and development in the field of education especially at the school level. To achieve this, the concept of holistic education has been identified by incorporating principles for improving the learning outcomes (Siddiquee, 2006; Lee, 1999; Zaaba *et al*, 2011).

Studies have indicated that for effective teaching and learning there is a need to consider the backgrounds of students in the process of education. For this purpose, as part of the Malaysian school improvement programme, the medium of instruction has been given more thorough attention and the following languages such as Malay, Tamil and Mandarin have been suggested to be given importance as medium of instructions. Furthermore, to create cultural harmony through education, it has been decided that a positive understanding would be promoted among the different clans, ethnicities in Malaysia through education. In a recent development, the Malaysian education ministry has undertaken measures to standardize the school curriculums across disciplines. For this purpose, many initiatives have been undertaken. One such initiative is development of unified curriculum goals to harmonize the links between theory and practice in education (Mok, 2006; Zaaba *et al*, 2011).

Teacher is an important element in the teaching and learning process. Realizing this, efforts are underway to improve the quality of teachers and teaching assistants at school level. Apart from academic activities, another dimension of the school improvement plan is to create links between public and private sector (Sharma, 2010). In this regard, new incentives have been declared to offer to

private school education providers in urban and rural areas. For the implementation of this step, a school information system has been well in place to collate the administrative and academic activities, student and teachers, community and school and ongoing monitoring (Lee, 1992). In another study, Ponk (1996) advised that one of the ambitious targets of Malaysian education system is to raise a developed and quality education by 2020. This is associated with the other key areas such as teaching and learning, research and development, training and evaluation and continuous monitoring (Brown, 2007)

Another important feature of the school improvement programme is developing teaching and learning modules. These are different types of modules focusing literacy skills from 4 to 6 years of students. To implement the step, concept development and critical thinking skills development has been prioritized as essential life skill. The next step is building commitment of stakeholders (Brown, 2007; Bajunid, 2000). For this purpose, different community awareness programmes have been started to educate parents, communities on their roles and responsibilities. To ensure the easy implementation of this process, a robust assessment and monitoring programme have been placed in (Jahanfar *et al*, 2009; Lee, 2000). Schools, school leaders, teachers and other staff have been promised some financial incentives to increase their motivation for work. These incentives consist of RM700, 000 per school and RM1000 per person. At the same time, allowances for performing students have also been declared. School development is dependent on school leadership (Liew, 2009).

For the development of schools, the role of head teachers and principals has been declared to be highly important. They have been called as change agents. Principals play an active role in developing schools. They are involved in the process of planning, coordinating and evaluating the teaching and learning process in schools. They also ensure a supportive school environment for the overall development of the schools. The new performance approach for head teachers and principals has the following main

key characteristics such as applicability, performance measurement and transparency in school performance and so on. These have been recognized as the foundational ideas to evaluate schools as functioning bodies (Lee, 1992; Brown, 2007).

CHALLENGES TO SCHOOL IMPROVEMENT PROGRAMMES

Education is the main basis for developing quality human capital for achieving the nation's goals. For producing excellent human resources, a practical and active school system is *sine qua non* (Coles & Southworth, 2004). The role of the education system is to prepare active and competent professional teachers (The education system in Malaysia faces many challenges. One of such issues is that Malaysia is having deficiency in the area of skilled human resource. The main cause for this deficiency is lack of practical educational practices at the school level. As already stated that the Malaysian comparatively poor in the region than Singapore or South Korea. The schools have the role to improve the skills of the graduates. But studies have depicted a bleak picture of the country in the region as compared of its competitors (Lee, 1999). Another biggest challenge is students' declining performance. In this regard, research has held poor teaching quality as the responsible factor for poor student provenance. Writers have indicated that students' performance could be improved by enhancing teacher effectiveness and introducing quality training programmes. Teachers must know different pedagogical approaches to ensure quality teaching and learning (Lie, Pang, Mansur & Malaysia, 2009).

A report by international labour organization declared Malaysian educational efforts to be unrealistic to produce highly skilled talent base. The studies have suggested for a dire need to develop strategies to refine Malaysian skills in workforce (Liew, 2009). In this regard, the roles of schools have been termed crucial and fundamental. Aside for providing the best learning environment, it

has been recommended that Malaysia must focus strengthen the education and training systems, infrastructure and quality of teachers and educators (Ahmad *et al*, 1999).

MEASURES FOR IMPROVEMENT

For the purpose of school improvement different measures have been adopted by the government. For the purpose of school improvement many measures have been undertaken such as strong school leaders, active involvement of the community and parents, teacher quality and administrative support. Some studies have suggested that for school development it is essential to develop close links with parents, communities, school boards, teacher unions and student organizations (Fullan, 1993; Hallinger, 2009). School improvement is a continued process. Research has suggested that for school improvement it is necessary to set high expectations for students, holding school accountable for the performances of students and teachers, provide a safe and conducive teaching and learning environment, create leaders, recruit and retain quality school staff, training of teachers, improved instructional system and curriculum, supporting students with extra help and time as well as involving the communities are some of the important measures (Cheng, 2000).

The most important elements in the school improvement process are school leadership. An active school leader may work actively through sharing knowledge and experiences, involving the entire school community in the development of learners. School environment has deeper effect on the development of students. There is a need to develop and create a safe, motivating and supportive teaching and learning environment at schools as well as maintaining high quality learning atmosphere (Coles & Southworth, 2004; Lee, 2000). Success in any aspect of the school improvement reforms needs standards, quality teaching and learning materials, competent teachers, robust and quality curriculum and assessment procedures, implementation and a

progressive leader. Administrators can manage change more effectively. For this purpose, there is a need to develop links between teachers, community, heads, students and the world of work. This association will lay the foundation of effective school improvement (Bajunid, 2000; Hallinger, 2003).

CONCLUSIONS AND SUGGESTIONS

On the basis of the extensive review, this paper concludes that school improvement should be considered a continual process. It is not a onetime activity. However, the major goals of the school improvement it necessary that there is close cooperation between school and parents, school and communities, faculty and parents, effective and active school principal, quality teachers, effective evaluation and monitoring tools. More specifically, for school improvement programme in Malaysia, this paper presents the following suggestions:

Develop the belief that school improvement plan is a process of creating and developing the actual plan for developing schools. This will help in understanding the fact that improvement is rooted in learning.

Up-to-date evaluating and assessment system. This will in knowing the effectiveness of the teaching and learning processes and brining improvement in practices.

Data based decision-making. This will help in taking an informed decision-making on school academic and non-academic matters.

Building meaningful partnership with the stakeholders. This will help in sharing responsibilities and developing a sense of ownership of the system of education.

Prioritizing goals. This will help in clearly focusing the direction and implementation of change.

Selecting the best practices. This will help in knowing and practicing the resources effectively to achieve the set goals.

Implementation and evaluation of the plan. This helps in reflecting

on the effectiveness of the plan and its various processes. Focusing student achievement. It must be kept in mind that the school improvement plan helps in determining the best ways and means to enhance students' development goals. As a conclusion, to see positive results from a school improvement programme, all individuals need to be involved. The relationships between school and community, school and parents, school and the global community and creating a lasting relationship with stakeholders are agent for the improvement.

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STUDENT'S SOCIAL PRESENCE IN ONLINE LEARNING: A REVIEW

Nur Jannah Jamil & Zaidatun Tasir

ABSTRACT

In the past decades, tremendous development of technology has taken place in worldwide from every aspect of society. Undoubtedly, it has provided great effect in educational setting too. Stimulated by the evolving developments in technology, online learning system has been widely implemented as a platform for distance learning, where the learning takes place up to the student's availability. Among the issues is on the role of interaction in online learning to enhance learning outcomes. Thus, in this paper, social presence in online learning interaction has been chosen to be explored.

Keywords: Online Learning; Social Presence; Interaction

1.0 INTRODUCTION

One of the most highlighted issue in online learning as mentioned by Badrinathan and Gole (2011), is the teacher or instructor is responsible to ensure that interaction occurs among students. The interaction plays important role to encourage students to share opinion, think and argue critically, and respond towards peer's reflection via computer mediated communication

(CMC). To support the idea of having interactive and meaningful communication, Short et al (1976) had promoted a theory called social presence. This theory has then been frequently implemented and selected to be the core subject experimented in previous studies (Richardson & Swan, 2003; Rourke et.al, 1999; Wenger, 1998; Tu, 2001; Saenz, 2002; Lapadat, 2003; Sung & Mayer, 2012). As a result, Cobb (2009) clarifies that social presence should be nurtured for the successful of online learning.

2.0 PROBLEM STATEMENT

Although online learning has been recognized as an impressive platform to promote learning, it still has its own challenge. The setting of online learning has been normally known as having the students and instructor in different places. Eventually, communication among students and instructors could be great indicator of the online learning. By having teacher and students in different places as promoted in distance learning, the students would have high probability to feel isolated and lack of social connection with others (Sung and Mayer, 2012). In this case, the aim of online learning in providing the best means of learning would be hindered. Therefore, in order to overcome this matter, online learning system has to accommodate the students especially with conducive learning environment with vast opportunities for them to engage socially with other students and the teacher.

Previous researches have shown that, in online learning, learners might encounter problem from the aspect of lacking in social engagement with other learners or the instructor (Bullen, 1998; Stodel et.al, 2006). The findings from a research carried out by Stein and Wanstreet (2003) show that students encountered difficulties in portraying their actual emotion via online learning environment. This problem normally took place when they intended to interrupt others in any online discussion.

Eventually, this situation illustrates that practicing effective and

meaningful interaction in learning, especially in online learning environment is vital in determining student's learning satisfaction (Sampson et.al, 2010; Lapadat, 2002). In another study, Cobb (2009) concludes that students who empower better social interaction in learning would have higher tendency to be more satisfied with their learning. The concept of social presence has been recognized to be well-connected to the social elements in traditional classroom environment, as well as in the online interaction (Sung & Mayer, 2012). Aragon (2003) has listed several behaviours that indicate social presence, which include "...both verbal and nonverbal actions such as gesturing, smiling, using humor and vocal variety, personalizing examples, addressing students by name, questioning, praising, initiating discussion, encouraging feedback, and avoiding tense body positions". Accordingly, extensive description and explanation on social presence will be deliberately provided in the following subtopics.

3.0 INTERACTION IN COMPUTER-MEDIATED COMMUNICATION (CMC) VIA ONLINE LEARNING SYSTEM

For the past few years, CMC has been widely used by those in educational field and lots of articles have been written about the role of technology in the 21st century (Crystal, 2001). In Malaysian Higher Education Institutions (HEIs), the implementation of e-learning as part of CMC is a step taken by the Ministry of Higher Education (MOHE) as an effort to promote effective learning through technology (Mohamed Amin et al. 2011). In other words, technology via CMC is no longer an uncommon subject in Malaysia especially in online learning system.

Nonetheless, there are several issues have been highlighted by previous researchers on the effectiveness of online learning system as a learning platform. Whiteside (2007) argues the efficiency of online learning system to contribute in

meeting the students' learning outcomes. Meanwhile, Nyahdusei (2011) also points out the competence of online learning in giving learning satisfaction to the students. Another issue occurs regarding online learning system is that whether it can support content-related interactions among the students and the instructor (Walker & Brian, 2007).

According to Walther (1992), many of the early researchers came to the conclusion that CMC was antisocial and impersonal because of the lack of social context in the interaction process. Although those problem arose in the previous decades, they might still continue nowadays since some online learning obstructs are still pointed out. Mykota and Duncan (2007) found several past reviews on online learning's lack of enhancement towards achieving the learning outcomes and higher drop out of the subject compared to traditional face-to-face instruction.

In contradiction, Kehrwald also states that a numerous numbers of online learning system participants including students and teachers cite positive experience with online learning. The positive ambience of online learning is also agrees by Walker and Brian (2007). They mention that discussion in online learning "...promote critical thinking, egalitarian participation and contributions from students..." who have difficulties to speak up their thought during face-to-face class session. The participation from both students and instructors in the online learning would develop interaction among them. Brinthaupt et al. (2011) proposed the opposite idea of interaction as he mentioned that the quality and quantity of interaction among the members of the online discussion, which include students and instructor, are important in determining the success of online education.

4.0 SOCIAL LEARNING THEORY

Learning occurs through social interaction and social learning is

the principle introduced by Vygotsky in 1896 through his theory of social development theory (Riddle & Dabbagh, 1999). According to Vygotsky, cognitive development never occurs by itself; rather, it is lead by social interaction and social learning. The gist of Vygotsky's theories has been the essential role of social interaction in the development of cognition (Vygotsky, 1978). This is parallel to his strong belief that in order to “making meaning”, the community of the student contributes a lot. The phenomenon of cognitive growth is also widely known as Zone of Proximal Development (ZPD) (Chaiklin, 2003). In ZPD, the term scaffolding is seen as a concept related in the development of students’ learning process. This is supported by Verinikina (2003) when she mentions that as part of Vygotskian socio-cultural psychology concept, ZPD is highly related to learning development.

Anderson and Krus (2007) have also mentioned that in social learning environment, the people of the same community have high tendency to replicate and model the behaviour they observe. Therefore, by implementing social learning theory in online learning environment, the students will gain lots of benefits in order to perform better in their learning. The benefits come through their experience in communicating and interacting with other students and also with the teachers in online learning. With vast experience in social communication, the students will gain more insights in controlling the interaction process in order to obtain the knowledge or fulfilling their social needs to the most.

Moreover, social learning theory introduced by Bandura also promotes that human behavior is learned, or in other words, it is “...acquired than innate.” (Bandura, 1973). According to Anderson and Kras (2007), the learning process is related to the study of the effect or circumstance of a behavior, then connects a stimulus to respond. The response produced after being stimulated is the behavior which is sought to be learned.

In online learning system, socialization is totally based on online interaction among students and the instructor of the

online course. Online interaction that occurs such as in the form of forum, chat, discussion board, blog and so on will provide learning environment that allow students to construct meaningful learning with the support from peer and expert. Through social presence model introduced by Whiteside (2007), the role of students and instructor in online interaction will be acknowledged in establishing the overall social presence within the course (Whiteside & Dikkers, 2008).

5.0 SOCIAL PERSPECTIVE OF COMPUTER-MEDIATED COMMUNICATION

Learning itself is a social process (Lowenthal, 2009). Harasim (2002) states that one of the important keys in the social process of learning is through discourse. In CMC, the major form of discourse is produced via the social interaction process that takes place between students and students and teacher and students. Gunawaderna and Zittle (1997) declare that social presence is established when people connect with one another in new settings. Nyahdusei (2011) proposes that communication that occurs in online group discussions has proven to be one of the supporting element in an excellent online learning system. In other words, all means of communication in online learning system are considered to present and nurture social presence among the users which include students and teacher or instructor.

Paradoxically, Eastmond (1995) objects the idea that CMC provides platform for interaction, but instead is reliant on constant postings by students to the group board, email and chatting in the regular interval. Nevertheless, based on research carried out by Ruberg et al (1996), they go against Eastmond's idea and arguing that CMC does support the development of social environment. The creating of social environment is nurtured in the activity of information sharing, discussing ideas and cooperating and collaborating in solving problems (Ruberg

et al., 1996; Hall & Herrington, 2010; Tu, 2001).

6.0 SOCIAL PRESENCE

The original definition of social presence is introduced by Short, Williams and Christie in 1976. As the initial investigators of social presence, Short et al (1976) identify social presence as "...the degree of salience (i.e., quality or state of being there) between two communicators using communication medium." The aim of this theory is to provide vast explanation on the effects of the way people communicate on the communication medium they use. Tu (2002) defines social presence as the "...degree of awareness of another person in an interaction and the consequent appreciation of an interpersonal relationship...in CMC"

The genesis of social presence lies in the conceptualization of social psychology of immediacy and intimacy in face-to-face interaction (Mykota & Duncan, 2007). According to Rettie (2003), in the context of face-to-face communication, immediacy refers to the "...psychological distance between two speakers...", meanwhile, intimacy explains the "...closeness obtained, verbally and non-verbally, among the individuals and maintained by immediacy behaviours." In previous researches, both pairs of researchers which include Argyle and Dean (1965), and Wiener and Mehrabian (1968) introduced intimacy and immediacy as the concept of social presence separately. However, Short et al. (1976) came out with another concept on social presence that combined both immediacy and intimacy. In other words, immediacy and intimacy are equally important in determining social presence.

Short et al (1976) also mentioned that social presence could be varied according to the variety of peoples' perception on it as to the amount of presence they need. In their article, Hall and Herrington (2010), supports Short's et al statement as they

mention that if low social presence is needed, the people might see the communication medium as "...cold and impersonal...", while it is perceived as "...warm, inviting and responsive..." if the social presence is high. There are several factors contribute to increment of social presence degree in interaction such as facial expression, direction of gaze, posture, dress, non-verbal and vocal cues (Tu, 2001).

7.0 SOCIAL PRESENCE IN ONLINE LEARNING

Several studies have shown significant impact of social presence development in classroom social networks (Wegerif, 1998; Swan, 2005; Mykota & Duncan, 2007; Tu, 2001; Shin 2002). However, according to Aragon (2003), most of the researchers have only concluded that there is significant relationship between social presence and learning development. They did not really mention whether the relationship would exactly benefit students from the aspect of academic performance or learning outcomes.

Nevertheless, sufficient interaction is necessary in nurturing social presence or otherwise, students will find that learning is dull and uninviting (Hall & Herrington, 2007). Nonetheless, the point is not on the frequency of the interaction, but more towards the types of interaction. Hall & Herrington (2007) add that the degree of social presence can be improved using affective language as they are indicators of intimacy and immediacy in online environment.

Another factor that also has strong influence in social presence in online learning is through online leaders (Tu, 2001). Online leaders or sometimes can be a student who has been appointed as group leader, or the teacher himself would help in facilitating the interaction. This provides opportunity for other students to develop trust in the relationship. Eventually leads to feeling of belonging to the group. Therefore, the possibility to perceive higher degree of social presence will occur.

Gunawaderna (1995) also agreed with the importance of online leader's role in nurturing social presence since the leader will provide the platform to initiate the interaction with introduction and salutation.

Gunawaderna and Zittle (1997) argue that "...in reviewing social presence research, it is important to examine whether the actual characteristics of the media are the causal determinants of communication differences or whether users' perceptions of media alter their behavior..." They found that social presence could be nurtured among students since social presence is recognized as the main attribute in success communication medium. Thus, in the context of CMC, the communication or interaction that occurs among students and teacher could be a good initiator on nurturing social presence in their learning environment.

Besides that, social presence in online learning is also connected through the notion of community. Hughes et al. (2007) mentions that neo-Vygotskyan approach to learning, where the focus is on developing community in learning, is being implemented to stimulate social elements among the online system participants. In other hand, Oubenaissa et al. (2002) induce element of social and culture in their learning model to obtain collaborative learning. Hughes et al (2007) also highlight that it is important for teacher or instructor to grasp the ideas on developing social dynamic within the interaction among the online learning participants.

Those issues and elements in building community in online learning system are actually converging to one matter, which is the necessity to develop strong relationship among participants with excellent sense of community. The relationship will be on trust-based that enough to make them become comfortable in personally sharing their ideas.

8.0 FACTORS IN ONLINE SOCIAL PRESENCE

Online social presence has been recognized as a significant factor in providing interactive and effective learning platform for online learning system. Thus, several researchers have showed high interest in identifying the indicator within online social presence (Sung & Mayer, 2012). Table 8(a) illustrates the finding from several researchers on the indicator of online social presence.

Table 8(a): Dimensions and Indicators of online social presence
(Adapted from Sung & Mayer, 2012)

Researcher(s)	Dimensions/ Indicators
Tu and McIssac (2002) and Yen and Tu (2011)	<ol style="list-style-type: none"> 1) Social Context 2) Online Communication 3) Interactivity 4) Privacy
Rourke et al. (2001)	<ol style="list-style-type: none"> 1) Affective indicators 2) Interactive Indicators 3) Cohesive Indicators
Polhemus et al. (2001)	<p>Affective use of language and person's ability to be perceived as real</p> <ol style="list-style-type: none"> 1) Personal address 2) Acknowledgement 3) Closing 4) Feeling 5) Paralanguage 6) Humor 7) Social sharing 8) Social motivators 9) Value 10) Invitation 11) Negative responses 12) Self-disclosure
Aragon (2003)	<ol style="list-style-type: none"> 1) Course design strategy 2) Instructor strategy 3) Participant strategy
Sung and Meyer	<ol style="list-style-type: none"> 1) Social sharing

(2012)	2) Social Identity
	3) Social respect
	4) Open mind
	5) Intimacy

9.0 ONLINE SOCIAL PRESENCE QUESTIONNAIRE (OSPQ) as RESEARCH INSTRUMENT

Online Social Presence Questionnaire (OSPQ) is a survey developed by Sung and Mayer (2012). This survey consists of five dimensions of social presence which include; Social Respect, Social Sharing, Open Mind, Social Identity and Intimacy, selected by Sung and Mayer from previous studies carried out by Aragon (2003), Polhemus et al. (2001), Rourke et al. (2001), Tu and McIssac (2002), and Yen and Tu (2011) (Sung and Mayer, 2012). Those previous studies tested on the best indicators of aspect of social presence in online learning.

Table 9(a) below shows the distribution of items for each dimension according to its indicator of social presence.

Table 9(a): Distribution of items in OSPQ (adapted from Sung & Mayer, 2012)

No.	Dimension	Item	Indicator of Social Presence
1	Social Respect	1	Express of appreciation
		2	Acknowledgement
		3	Timely response
		4	Use humor
		5	Strike up communication
2	Social Sharing	6	Social relationship
		7	Sharing learning information
		8	Express belief or value
		9	Social motivation from facilitator
		10	Close relationship

3	Open Mind	11	Express agreement
		12	Express positive view
		13	Self-disclosure
4	Social Identity	14	Use greetings title
		15	Address learner by team name
		16	Learner's characteristic
		17	Address learner by name
5	Intimacy	18	Express personal's stories
		19	Express emotion or feeling

10.0 DISCUSSION AND CONCLUSION

Based on the review that has been carried out on social presence, there are still several issues related to social presence in online learning that are not being much explored. Social presence could be a great mechanism in providing lots of opportunities for online learning to be improved and studied from the aspect of online interaction. In order to ensure that social presence benefits both learners and instructor of online learning courses, they need to be aware of each elements comprised in social presence.

Besides that, social presence itself requires in-depth understanding for it to be meaningfully utilized for the sake of better learning outcome. In an online interaction, the frequency of social presence occurrence could be increased tremendously for the sake of effective and resourceful interaction if the students and teacher were given knowledge on it. In other words, further research on the role of students to their peers, and the role of instructors to the students in nurturing social presence should be done. Thus, the findings could give a new insight on the implementation of social presence in enhancing online learning.

In conclusion, as we are studying and doing research to find the best approach, tool, strategy and method to improvise online learning, the interaction process that takes place among

students and teachers should not be neglected. Hence, social presence should also be prioritized and be seen as an element that plays a central role in ensuring success for students in online learning courses.

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ENHANCING TEACHING SKILLS FOR AUTISTIC CHILDREN

Hani Arnous & Yeo Kee Jiar

ABSTRACT

This is a conceptual paper focuses on effective methods of teaching autistic children. Children with autism typically do not converse well with others. As a result, they may face issues and challenges in their daily life. They may find it hard to communicate with others and difficult to make friends. Despite these shortcomings, they are able to learn the basic verbal communication skills to benefit from school education. In order to achieve these basic social communication and social interaction, these children ought to be taught with appropriate approaches from an early age. In this paper, four teaching methods for autistic children, namely computer-based instruction, video modeling, educational applications and E-learning systems were discussed with evidence from some researches findings.

INTRODUCTION

Autism spectrum disorders (ASD) are pervasive developmental disorders that include autistic disorder, Asperger syndrome and Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS; American Psychiatric Association, 2000). Many school-aged children with ASD appear unresponsive to traditional approaches (e.g., didactic and constructivist approaches) to teaching literacy skills (Lord, Rutter, & Le Couteur, 1994;

Prizant, 1983; Tager-Flusberg, 1999). Regardless of whether instruction occurs in regular education classrooms or in special education/remedial classrooms with lower student–teacher ratios and specialist teachers, students with ASD often have difficulties with learning symbols and communicating academic concepts. Students with ASD also appear to have difficulty in forming appropriate relationships with teachers and other students, which might impede their academic progress (Krantz&McClannahan, 1999; Koegel, Matos-Fredean, Lang, &Koegel, in press; Machalicek et al., 2008; Pelios, MacDuff, & Axelrod, 2003).

OVERVIEW OF RESOURCES FOR AUTISTIC CHILDREN

Recognition of the disorder and accurate diagnoses are the first steps in the provision of appropriate services. The resources available to children and adolescents with ASD are increasing, but parents often struggle with access to effective services. Information regarding social skill training services is available through local and national organizations, with the Internet being one of the most effective ways to access information about specific opportunities in the child’s community.

For example, pediatricians or parents may visit the Website for the national advocacy group which name is Autism Speaks (www.autismspeaks.org) found in New York and search for local social skills training opportunities under the Family Services tab. In addition, many large cities have Websites designed to provide information about accessing local services. For instance, in the Seattle (WA) area, the Website of the Asperger Support Network (www.seattleaspergers.org) provides information about social skills training opportunities in the area. The Website describe typically social skills groups provided by speech therapists, occupational therapists, Board-certified Behavior Analysts, or mental health therapists in the area. In addition, many different social skills curricula can be found by searching online book retailers, as well as through local libraries and

bookstores.

Another good way to access services is through the schools of children and adolescent with ASD. As schools are becoming more familiar with the needs of this population, they are more commonly offering social skills groups for these children through their individualized education programs (IEPs). Parents and pediatricians may request social skills groups as a part of the IEP for any child on the autism spectrum if this is not already being provided. As with all school-based services provided through an IEP, this service is free of charge to parents and is considered part of the child's education. In continue I mention appropriate teachings methods / skills for ASD children.

In Malaysia, there are a number of organizations in big cities that provide resources for parents with autistic children. For instance, The Association of Resource and Education for Autistic Children (REACH) and Parents' Resource for Autism Malaysia (PR4A). The main aim of these organizations is to provide resources for parents, teachers and individuals to learn in order to help children with autism. Parents and teachers of autistic children need to learn the methods and skills to educate and train autistic children to enable them to participate to their fullest capacity in the family, school and community.

Autistic children generally have language, communications, social and cognitive skills problems. Due to these problems, children with autism learn better with visual aids, imitation and structured environments that accommodate their sensory sensitivities and routines. Learning about teaching methods for autistic children helps teachers and parents to teach autistic children more effectively. There are four teaching methods that are appropriate to teach autistic children: computer-based instruction; video modeling; educational application and e-learning system.

Computer-based Instruction

Computer-based instruction (CBI; e.g., Massaro&Bosseler,

2003; Hetzroni&Tannous, 2004) is a potentially viable approach to teaching literacy skills to students with ASD for several reasons (Powell, 1996). First, research has shown that students with ASD often respond well to teaching techniques that involve information presented visually (Bondy& Frost, 1994; Whalen et al., 2010) and, CBI presents opportunities for dynamic customizable visual displays. Second, CBI could be used to minimize the impact of social deficits inherent in ASD by reducing the quantity and complexity of student–teacher interactions. That is, students with ASD might benefit more from literacy instruction if they do not have to simultaneously engage in social interaction with the teacher. Third, research has suggested that students with ASD tend to be highly responsive to using computers, which could make academic demands delivered via computers less aversive or more palatable (Lahm, 1996). Finally, CBI can be used to individualize instruction by selecting difficulty settings appropriate for a particular student’s ability level.

Although CBI offers several potential benefits to students with ASD, potential negative outcomes are also possible. For example, if students and teachers interact less when the student is using the computer then the student may have fewer opportunities to practice verbal communication, social skills, joint attention, and eye contact. The reduced opportunity for social interactions could lead to missed opportunities to develop social skills or even to a loss of social skills (e.g., Bernard- Opitz, Ross, &Tuttas, 1990). Additionally, because children with ASD may have a tendency to perseverate on computer use, CBI may result in the development or strengthening of computer-based stereotypies and/or challenging behavior maintained by computer access (e.g., Powell, 1996).

Several recent reviews have examined the effectiveness of CBI. Blischack and Schlosser (2003) conducted a review on the role of speech generating devices and talking word processing software on teaching independent spelling to children with autism. Their review revealed the importance of multi-model feedback (i.e., speech and print) in teaching spelling to learners with autism.

Ramdoss et al. (2011) reviewed CBI used to improve communication in children with ASD and found CBI to be a promising practice for improving vocal and non-vocal communication. Given the need to ensure the academic progress of students with ASD, a systematic review on the use of CBI to teach literacy skills (e.g., reading, sentence construction) for students with ASD is warranted (Wang, 2009).

Video Modeling

Video modeling is a different type of interventions, social skills, children with autism to watch videos of themselves or other children kind of success appropriate social skills and then mimic those skills which are modeled on the Self-timer. Research supported by modeling with video as an effective intervention so that children and adolescents with autism, many kinds of knowledge, including training in social skills (Heimann, 1995). Through video modeling skills learned quite persistent over time and to generalize about other people and settings. Simulation of the video seems to be more effective in combination with other interventions for learning social skills (Parsons, 2006).

Technology will likely be an important aspect of service delivery as it may be able to replace more costly personnel resources with cost-efficient procedures. Currently, there is little research focusing on the efficacy and efficiency of the use of technology in this context, particularly within schools, the most common setting in our review. While some technologies are low in cost both to acquire and to operate, it may be the case that others are less resource efficient or less accessible than traditional procedures that do not incorporate technology. Most prevalent technology currently being used is video technology.

The articles included in the current review indicated success in the use of DVD and video technologies in modeling appropriate skills, and to a lesser extent, in delivering feedback. The second most prevalent technology was the use of audio

devices to deliver scripts. One significant advantage to these two technologies is the ease of use and dissemination. Compared to other technologies (e.g., virtual environments), video/DVD and audio scripts are relatively inexpensive and easily available through an internet search or local store.

Video cameras and audio recording devices are also relatively simple to use. Conversely, the use of computer programs or robots would require specialized knowledge, especially if programs do not already exist to serve the desired purpose. As Ayres and Langone (2005) submit, video allows the perfect demonstration of a particular skill over repeated presentations with little involvement of a researcher or practitioner; audio scripts have this benefit as well. This is advantageous for obvious reasons, not the least of which is the benefits associated with repeated practice and numerous instructional opportunities (Elliot & Gresham, 1993). Since the vast majority of articles included in this review used one of these two technologies, a possible conclusion could be made that they are the most accessible to most researchers. As there are many other technologies that have not yet been empirically evaluated, future research could focus on the utility and efficacy of more and new technologies.

A majority of studies focused on conversational skills. Nearly one quarter of studies also addressed play skills. Within the context of this review, few studies evaluated the use of technology in addressing deficits in social problem solving, emotion regulation, or peer relationships. Relatedly, conversation and play may be important prerequisite skills to developing friends or acquiring other advanced social skills. Our criteria may have been too stringent; perhaps other topographies were addressed in less experimentally rigorous evaluations.

The technologies used in the studies which reviewed were applied to more than one social skill. Of particular importance is that the most common technological intervention (video/DVD) appeared to be the most versatile spanning conversation, play, nonverbal behavior, and emotion identification and regulation. As reported previously, few studies addressed more complex social

skills such as emotion regulation and reciprocity. However, it appears that video/DVD technology is a promising intervention option.

Educational Applications

Previous experiments show that teaching concepts to children with autism through technological devices has many advantages over the traditional methods. Children with autism were more attentive, more motivated, and learned more vocabulary with educational software programs of a computer than with the behavioral program. Adding computerized games to the regular language therapy sessions produced the following results: children were more attentive, had more communicative initiatives and more eye contact, were more interactive, used more verbalizations, and made more action requests.

The reason we chose to design an application for the skill of sequencing is because sequencing events in a story is an important expressive language skill that is frequently absent in children with autism. It is one of the basic skills underlying communication, reading, and speaking, but there is no available evidence showing how the development of sequencing skills in children with autism can be assisted by an iPad application.

A lack of sequencing story events skills limits the use of language that promotes interactions, which results in a further decrease in opportunities to engage in a meaningful communication experience. For example, when an adult initiates a conversation with a child (e.g., tell me what you did today), the child may not respond if he/she does not know how to sequence in his mind and explain the events he/she was engaged in during the day in the order they happened.

Studies focusing on teaching sequencing story events skills to children with autism have reported favorable language development gains. Increase in sequencing story events skills has resulted in increases in social interactions, positive affect, and

spontaneous speech, as well as improvements in expressive language and social-communicative behaviors (Jones, 2006).

Learning how to sequence story events helps children form connections between different stages of an event. For individuals with autism, it is hard to assemble the pieces from each stage and see the event as a whole. Sequencing game cards are used in the education of individuals with autism since they help children analyze pictures, put the events in the correct order, and predict the consequences of actions. If the individual does not understand the sequence of events, then he/she cannot narrate the event.

Sequencing activities also help children with autism to acquire the prerequisite skills for reading and writing. In order to sort the images, children should be able to think of a story in pieces and distinguish the differences between its stages. The ability to notice the differences and understand what the images represent is one of the prerequisite skills for reading. In order to read, children should be able to differentiate the letters, i.e. Realize that A is different from B.

The skill of telling apart different photographs depicting distinct stages of an event prepares the student to differentiate letters and words later on, which are more abstract than pictures. Thus, the skills of reading and distinguishing different words that are written or spoken build on the skill of assigning meaning and distinguishing different stages of an event, which is acquired by sequencing story event photographs (Krantz, 2005).

Applied behavioral analysis (ABA). Applied Behavioral Analysis (ABA) is a scientific method that investigates environmental variables influencing socially important behaviors and uses those findings to implement interventions that will improve such behaviors. ABA principles posit that immediate consequences have the largest effects, and that reinforcement is key in behavioral change programs. These ideas are employed in ABA-based behavioral modification programs for individuals with autism (Cooper & Heron, 2007).

The first phase of ABA starts with evaluating the individual's behaviors and skills. In this stage, target behaviors need to be

analyzed in detail. Skills are broken down into simple steps and every session consists of discrete trials that aim to teach the individual that specific skill. In the teaching session, first an instruction is presented to the individual in a clear and consistent tone. After waiting for a response for a while, if the correct response is not given, the individual is directed to the desired response by providing prompts.

ABA, being a faultless teaching approach, aims to prevent individuals from giving erroneous answers, so prompting the individual to perform the desired behavior is an important part of this method. These prompts can be provided as visual cues, such as pointing out the correct answer or fading out the wrong options. Prompts need to be repeated until the desired behavior is performed and reinforcement should immediately follow the correct response to make the child understand the connection between the correct answer and the reward. These steps are repeated by fading the prompts and the reinforcers gradually as the child begins to perform better. In the application, they used the prompt and prompt-fading procedures of ABA and designed the testing and teaching versions of the application according to the ABA steps described above (Birkan, 2013).

e-Learning System

E-learning system for autism children is proposed to help children with ASD at early school age (4-6) years, to teach the alphabet with the help of visual objects in an interactive way. Repeating the sound of letters to the child with their shape accompanied with pictures, and also giving him/her a chance to practice writing these letters under the supervision of expert teachers, who should know the level of each child by a background database. All these points are put in together to increase the possibility of learning for the ASD children and also will be as a tool for teachers to document each child progress in the child's database.

The system is an e-learning tool for teachers, because it is the school system. Teachers can share together sufficient time for these children to have three ASD instead of training time after the other. The current system is divided into three levels of write 26 English alphabetic letters of the English alphabet, divided into level with eight or nine points for a child with a capacity of listening and practice for each letter of the Repeater to teach to cover. The teacher can also represent the child in this system, as each letter can be handwritten. This stage is given to a child after he had the form of a specific letter. The child has the opportunity to go back and forth, other maps show it as they are written, if desired (Blischak, 2003).

This system can also be a tool full of hope for the parents. You can gain access to the system and the progress of their children and the ability to see your comments and recommendations for your child from the teacher, it is necessary to take into account, to add a password to your child. Children with ASD to learn easily and with this system, faster because they do not have to draw letters on paper, most of them are hard to do. Instead, just click on the button you want to appear in the letter on the screen and see will continue with other letters and words to find out. When the teachers have the system check, you can decide to separate children from teaching movie within the system, accompanied by conduct or download more movies, whenever it is necessary to do so. Maybe the child as entertainment, but also a teaching, perhaps is a Professor of writing and other, or after each complete each level after testing and so on, in accordance with the decision on the basis of knowledge of the characteristics of each child (Machalicek, 2007).

CONCLUSION

The use of CBI to improve the literacy skills of children with ASD is a promising practice. Teachers using CBI should carefully consider the preferences and existing abilities of students and the customizability of the software when deciding to use CBI and

selecting a software program.

Studies focusing on teaching sequencing story events skills to children with autism have reported favorable language development gains. Increase in sequencing story events skills has resulted in increases in social interactions, positive affect, and spontaneous speech, as well as improvements in expressive language and social-communicative behaviors.

Effective use technology can be integrated into interventions for social skill deficits. Technology will likely be an important aspect of service delivery as it may be able to replace more costly personnel resources with cost-efficient procedures. Currently, there is little research focusing on the efficacy and efficiency of the use of technology in this context, particularly within schools, the most common setting in review. While some technologies are low in cost both to acquire and to operate, it may be the case that others are less resource efficient or less accessible than traditional procedures that do not incorporate technology.

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PENGAJARAN REKACIPTA DALAM MATA PELAJARAN KEMAHIRAN HIDUP SEKOLAHRENDAH BERDASARKAN KEMAHIRAN BERFIKIR SECARA KREATIF DAN INOVATIF.

Anwar Hamid Pa, Aede Hatib Musta'amal & Mohd Khatta Jabor

ABSTRAK

Penguasaan Kemahiran Berfikir Secara Kreatif Dan Inovatif di kalangan generasi muda khususnya murid-murid di sekolah rendah berupaya merealisasikan matlamat pendidikan kebangsaan. Kajian ini dijalankan untuk meneroka pelaksanaan pendekatan pengajaran Kemahiran Berfikir dalam pengajaran dan pembelajaran Reka Cipta yang diajar oleh 4 orang guru pakar (Guru Cemerlang) Kemahiran Hidup di 4 buah sekolah di negeri Johor. Kajian ini juga ingin memahami masalah-masalah yang dihadapi oleh guru-guru tersebut semasa melaksanakan pendekatan Kemahiran Berfikir Secara Kreatif Dan Inovatif. Kajian ini dilaksanakan dalam tempoh setahun menggunakan Pendekatan Kajian Kes secara Kualitatif pelbagai tempat dengan pemerhatian, temubua mendalam dan analisis dokumen pengajaran sebagai instrumen pengumpulan data. Pemilihan 4 orang guru pakar sebagai peserta kajian dilakukan secara bertujuan (Purposeful Sampling). Pemerhatian pengajaran dilakukan di dalam kelas dan bengkel Kemahiran Hidup dilakukan sebanyak 10 kali bagi setiap orang guru diikuti dengan temubual dengan berpandukan protokol

temubual yang disediakan dan semakan dokumen pula dilakukan mengikut keperluan. Data-data dianalisis secara kualitatif dan untuk menentukan kebolehpercayaan data, pengkaji menggunakan nilai persetujuan KAPPA (Cohen, 1960). Manakala kesahan data pula diperoleh dari pengesahan peserta kajian.

1.0 PENGENALAN

Reka Cipta merupakan salah satu cabang dalam bidang Kemahiran Hidup dan 2000 Teknik Dan Vokasional (TVE). Mata pelajaran ini bercorak amali yang diajar di Tahap Dua dalam Kurikulum Bersepadu Sekolah Rendah. Mata pelajaran ini digubal untuk mengembangkan keupayaan mereka cipta, manipulatif, keusahawan dan pengurusan diri melalui penguasaan praktis dan pengetahuan serta menumpukan sikap yang positif berasaskan teknologi dan keusahawan. Kurikulum mata pelajaran Kemahiran Hidup Sekolah Rendah (KHSR) telah dilaksanakan pada tahun 1993 di semua sekolah rendah. Mengikut Peraturan-Peraturan Pendidikan (Kurikulum Kebangsaan) 1997, KHSR telah dikategorikan sebagai mata pelajaran wajib. Berdasarkan tafsiran dalam peraturan berkenaan, sesuatu mata pelajaran wajib mestilah dipelajari oleh semua murid di sekolah kerajaan dan bantuan kerajaan (Pusat Perkembangan Kurikulum, 2005).

Reka Cipta merupakan komponem utama dalam mata pelajaran Kemahiran Hidup digubal dengan hasrat membentuk minda yang kreatif, inovatif dan inventif sebagai persediaan tenaga pekerja yang bermaklumat dan berketerampilan dalam menempuhi perkembangan dan cabaran dunia teknologi di alaf baru (Pusat Perkembangan Kurikulum, 2003).

Bagi mencapai status sebagai sebuah negara pembuat baru di rantau ini yang mampu mengeksport hasil pembuatan negara ke pasaran antarabangsa, negara kita Malaysia memerlukan lebih ramai lagi pakar mereka cipta atau pereka yang terdidik daripada golongan muda. Tajuk Reka Cipta ini akan memberi pendedahan dan peluang untuk menyediakan diri para pelajar bagi menyahut cabaran Wawasan 2020 serta menunjukkan betapa pentingnya

pengajaran Reka Cipta kerana subjek ini adalah cabaran untuk melahirkan masyarakat saintifik dan progresif, masyarakat mempunyai daya perubahan yang tinggi dan berpandangan ke depan yang bukan sahaja menjadi penggunaan teknologi tetapi juga menyumbangkan kepada tamadun saintifik dan teknologi masa hadapan yang melahirkan ciptaan-ciptaan baru memenuhi pasaran yang berdaya saing.

Subjek Reka Cipta adalah bercorak amali dan pengetahuan yang diajar pada tahap II (Tahun 4, 5 dan 6) dalam Kurikulum Baru Sekolah Rendah (KBSR). Mata pelajaran ini diperkenalkan bagi mengembangkan lagi keupayaan murid untuk menguasai kemahiran praktis, pengetahuan serta nilai dan sikap dalam bidang pembelajaran yang diperkenalkan. Kurikulum ini masih menjurus ke arah memperkembangkan kebolehan murid dalam kemahiran teknologi, kemahiran merekacipta dan juga aspek keusahawanan. Kemahiran asas yang sedemikian dapat digunakan sepenuhnya bagi membolehkan murid berdikari dan yakin diri serta mampu menjalani kehidupan secara produktif dalam dunia teknologi dan ekonomi yang serba kompleks dan sentiasa berubah ini. Murid juga digalakkan merebut peluang yang ada secara bijak, kreatif dan inventif (PPK, Kementerian Pelajaran Malaysia, 2005).

2.0 LATAR BELAKANG

Sememangnya Wawasan 2020 dan Pelan Induk Pembangunan Pendidikan (PIPP) adalah bertujuan untuk melahirkan rakyat yang berkompeten, berkreaitif dan inovatif. Hal ini kerana kita tidak seharusnya menjadi pengguna teknologi sebaliknya hendaklah menjadi penyumbang teknologi. Untuk merealisasikan matlamat ini, sistem pendidikan kita perlulah menerapkan kemahiran kompeten, kreatif dan inovasi dalam kurikulum sekolah. Matlamat pendidikan adalah untuk melatih pelajar berfikir dan mencapai tahap mahir. Kemahiran dapat dikuasai melalui pengajaran dan pembelajaran yang tersusun di samping mempunyai keazaman untuk memperbaikinya dan diikuti dengan latihan. Laporan Jemaah

Nazir Persekutuan mendapati ramai guru yang tidak menerapkan kemahiran berfikir secara kreatif dan inovasi dalam pengajaran walaupun telah lama diperkenalkan di sekolah secara tidak formal. Pelajar berminat untuk belajar jika pengajaran berbantuan kreativiti dan inovasi yang dapat mewujudkan suasana bilik darjah dan bengkel kemahiran hidup yang mengembirakan.

Pada akhir-akhir ini, masyarakat yang kreatif dan inovatif amat diperlukan supaya matlamat Modal Insan dapat dicapai untuk pembangunan negara. Dalam usaha menyediakan tenaga kerja yang berkualiti untuk mencapai kecemerlangan negara yang berterusan, mantan Perdana Menteri Malaysia Tun Abdullah Ahmad Badawi telah membangkitkan Konsep Modal Insan. Hasrat kerajaan adalah tinggi dalam melahirkan generasi pelapis yang berkualiti dan berkompeten dalam menerajui negara ke arah kemajuan yang bakal dicapai terutamanya dalam menghadapi Wawasan 2020. Masyarakat yang kreatif bermaksud masyarakat yang mempunyai kebolehan mewujudkan sesuatu yang baharu..

Masyarakat yang inovatif pula bermaksud masyarakat yang memiliki kemampuan untuk menciptakan sesuatu yang baharu. Sebagai institusi pelajaran, sekolah memainkan peranan penting dalam melahirkan pelajar yang kompeten, kreatif dan inovatif. Menurut mantan Perdana Menteri, Tun Mahathir Mohamad, Malaysia mempunyai sistem pendidikan yang terbaik dalam kalangan dunia ketiga maka kejayaan yang perlu dicapai mempunyai kaitan dengan cabaran keenam Wawasan 2020 iaitu mewujudkan masyarakat yang saintifik dan progresif, masyarakat yang inovatif dan memandang jauh ke hadapan.

3.0 PERNYATAAN MASALAH

Reka Cipta merupakan komponen dalam mata pelajaran Kemahiran Hidup yang diajar secara amali berunsurkan teknikal dan teknologi. Ia ditawarkan kepada semua murid dari tahun 4 hingga tahun 6. Ia dirancang sedemikian rupa untuk mencapai matlamat ke arah mempertingkatkan produktiviti negara melalui

penglibatan masyarakat secara kreatif, inovatif dan produktif (KPM, 2002). Pembelajaran kemahiran secara jelas melatih pelajar mempertingkatkan kemahiran kognitif, psikomotor dan efektif secara bersepadu, dan ini sangat penting demi menjayakan Falsafah Pendidikan Kebangsaan yang menjurus kepada pembinaan insan yang harmoni dan dapat memberikan sumbangan kepada negara, masyarakat dan keluarga.

Pendidikan di Malaysia kini semakin rancak dengan penggunaan teknologi yang sentiasa berkembang maju bagi melahirkan pelajar yang berkualiti dari segi nilai intelek dengan ketinggian nilai moral. Guru yang mempunyai daya pemikiran kreatif dan inovatif dapat melatih pelajar sentiasa bersedia untuk menghadapi transformasi pendidikan, yang menjurus kepada penyelidikan dan reka cipta dengan penyepaduan pendekatan pembangunan kemahiran berteraskan pemikiran yang kreatif dan inovatif dalam penyelesaian masalah Reka Cipta. Kajian ini bertujuan untuk mengaplikasikan Model Pengajaran Reka Cipta berdasarkan teori pemikiran kreatif dan inovatif

Kementerian Pelajaran Malaysia (KPM) menyatakan bahawa pendidikan KH yang dijalankan di sekolah memberi penekanan kepada nilai murni dan semangat patriotik bagi menyedarkan murid akan peranan dan tanggungjawab mereka sebagai warganegara maju dan masyarakat berilmu. Murid dididik untuk berfikir, berilmu pengetahuan luas, bertataetika tinggi, bijaksana, serta dapat menggunakan teknologi maklumat dan komunikasi secara berkesan. Pendidikan KH ialah mata pelajaran wajib di peringkat sekolah rendah. Mata pelajaran ini bertujuan memberi murid pengetahuan asas ketukangan, perkebunan, jahitan dan perniagaan serta memberi murid pengalaman menghasilkan projek Reka Cipta yang mudah (KBSR KH, 2000).

Menurut Anita Kosnan (1996), Perlaksanaan Kemahiran Hidup Sekolah Rendah tidak berjalan lancar sepertimana yang diharapkan. Menurutnya lagi, masalah utama perlaksanaan KH SR di sekolah rendah ialah ketiadaan bengkel, peralatan yang tidak cukup dan sebahagian besar guru yang mengajar RekaCipta tidak mempunyai latar belakang dan latihan yang formal dalam bidang

matapelajaran tersebut.

Menurut Hj Mohd Bukhari et.all.(2007), hasil dari perbincangannya dengan peserta Kursus Pendek Kelolaan Maktab Perguruan Sultan Mizan, Besut, Terengganu pada tahun 2004 dan 2005 yang terdiri daripada guru-guru KH daerah Besut, didapati pelaksanaan mata pelajaran KH sering ‘terganggu’ dengan pengisian mata pelajaran peperiksaan di samping terdapat juga banyak sebab tertentu yang menyebabkan perlaksanaannya kurang berkesan.

Kemahiran berfikir yang dicadangkan dalam pengajaran Reka Cipta ialah menjana Idea, membuat perbandingan, membuat keputusan, membuat inferens dan membuat justifikasi (KPM 1996). Menjana idea merupakan kemahiran untuk menghasilkan idea-idea baru yang boleh digunakan untuk mencipta sesuatu, selain dapat menyelesaikan sesuatu masalah. Idea-idea baru yang dihasilkan menerusi penjanaan idea ini biasanya tidak pernah difikirkan sebelum ini. Membuat inferens pula bermaksud mampu menggunakan minda untuk membuat kesimpulan berdasarkan bukti-bukti dan pola-pola tertentu (Som & Mohamad Dahalan 1998). Kesemua Kemahiran Berfikir yang dicadangkan adalah merangkumi kemahiran berfikir kritis dan kemahiran berfikir secara kreatif dan inovatif.

Kajian-kajian lalu, laporan daripada pihak kementerian dan tinjauan yang dibuat di sekolah-sekolah menunjukkan pendekatan pengajaran di dsalam kelas dan bengkel masih berpusatkan guru dengan mengutamakan kaedah syarahan. Guru lebih banyak memberi syarahan, penerangan dan bercakap semasa menyampaikan pelajaran di dalam kelas dan bengkel berbanding murid (Salbiah 1992; Aini 1994; Abd Rahim Ahmad 1985; Rajendran 1998. Amalan pengajaran guru di dalam kelas dan bengkel lebih kepada meminta murid mengeluarkan semua apa yang diajar oleh guru tanpa memberi peluang mereka memberi pendapat, mengemukakan soalan dan menganalisa fakta-fakta yang dipelajari Abd Rahim Abd Rasshid 1999).

Walau bagaimanapun kebanyakan guru kurang kemahiran untuk mengemukakan soalan-soalan yang dapat m, enggalakkan dan

mencetuskan pemikiran murid (Jemaah Nazir Persekutuan 1997). Menurut John Arul (1996), teknik penyoalan samada secara lisan atau tulisan tidak digunakan dengan meluas oleh guru di dalam kelas. Sesetengah guru lebih berminat berhujah sepanjang waktu pengajaran dan aktiviti penyoalan secara kreatif dan inovatif dihadkan. Beban kerja guru adalah berat kerana mereka terpaksa melakukan kerja-kerja pengkeranian, pentadbiran dan kokurikulum. Beban tugas yang bertambah ini menyebabkan sesetengah guru meminggirkan pendekatan pengajaran kemahiran berfikir secara kreatif dan inovatif (Fryer 1986; Zahara et al. 2000).

Berdasarkan kenyataan yang diberikan, amalan penyelesaian masalah secara kreatif di dalam penghasilan produk serta idea di dalam mereka cipta adalah perlu bagi pelajar yang mengikuti tajuk Reka Cipta ini. Proses mereka cipta merupakan salah satu panduan proses penyelesaian masalah tetapi amalan kaedah penyelesaian masalah yang digunakan oleh pelajar terhadap proses mereka cipta masih tidak jelas. Sehubungan dengan itu, pengkaji ingin mengkaji sejauh mana amalan penyelesaian masalah secara kreatif di dalam tajuk Reka Cipta diamalkan di kalangan pelajar mengambil mata pelajaran Kemahiran Hidup di sekolah rendah.

2.1 Perlaksanaan Kemahiran Hidup Di Sekolah Rendah

Bahagian ini membincangkan beberapa pandangan, cadangan dan penulisan yang berkisar mengenai detik bermulanya matapelajaran KHSR dan kepentingan perlaksanaan matapelajaran KH yang dijalankan di sekolah. Ia juga akan dibahagikan kepada 4 bahagian iaitu perbincangan, pendahuluan, tinjauan am, kerelevanan dengan persoalan kajian dan rumusan.

Sistem pendidikan masa kini sedang mengalami perubahan yang amat pesat sekali. Pelbagai kaedah baru telah diperkenalkan serta digunakan supaya pengajaran guru menjadi lebih berkesan dan menjadikan pembelajaran murid lebih bermakna. Dalam bahagian ini penyelidik akan menyorot beberapa kajian, pandangan

serta kenyataan yang mempunyai kaitan rapat dengan tajuk yang dikaji. Penyelidik akan memberi perhatian kepada persepsi dan cabaran guru-guru yang mengajar matapelajaran Kemahiran Hidup di sekolah rendah. Sumber-sumber yang mengandungi kenyataan, fakta, teori dan pendapat yang menyokong kepada pemasalahan dalam kajian juga akan dikaitkan.

2.2 Persepsi Terhadap Matapelajaran Kemahiran Hidup

2.2.1 Pengetahuan Guru

Kajian akan cuba mengenalpasti tahap pengetahuan guru dalam melaksanakan pengajaran dan pembelajaran Kemahiran Hidup. Adakah guru-guru ini mendapat pendidikan dan kemahiran yang sewajarnya sebelum mereka dinobatkan sebagai seorang guru Kemahiran Hidup.

Bainier et al. (1995) menyatakan guru merupakan golongan profesional yang mempunyai pengetahuan dalam subjek, kaedah pedagogi yang boleh dimanfaatkan kepada para pelajar mereka. Pengetahuan dan kemahiran guru dalam bidangnya akan mempamerkan kewibawaannya untuk melaksanakan tanggungjawab sebagai guru terutama sekali guru yang terlibat dalam pengajaran dan pembelajaran mata pelajaran Kemahiran Sekolah Rendah kerana ia melibatkan pengurusan bengkel.

2.2.2 Pengalaman Guru

Pengkaji juga ingin mengetahui tentang pengalaman mengajar dan mengendalikan peralatan tangan di kalangan guru-guru yang berpengalaman melebihi lima tahun. Di sini juga pengkaji ingin menyorot kembali latar belakang samada pengajar pernah membuat kerja-kerja pertukangan sebelum menjadi seorang guru.

Tujuan penguasaan dalam pengurusan bengkel ialah untuk mengelakkan kemalangan semasa menjalankan aktiviti amali dan

aktiviti lain di dalam bengkel. Ia juga bertujuan untuk meningkatkan produktivi dan mengurang kos pengeluaran semasa penggunaan bahan dijalankan. Dengan langkah-langkah yang diambil ia dapat mengurangkan pembaziran dalam penggunaan bahan dan dapat menjimatkan kos.

2.2.3 Pengurusan Bengkel

Perlaksanaan matapelajaran Kemahiran Hidup memerlukan pengurusan bengkel yang bersistematik dan berkesan supaya pengajaran dan pembelajaran dapat berjalan dengan lancar dan teratur. Pengurusan yang efisien dan efektif memainkan peranan yang penting dalam setiap organisasi kerana ia adalah sebagai penggerak dalam organisasi itu. Ia juga merupakan perancang dan penentu dalam setiap langkah-langkah yang telah dirancang supaya hasilnya memenuhi sasaran Kementerian Pelajaran Malaysia untuk menjadikan pendidikan di Malaysia bertaraf dunia.

2.2.4 Peranan Pentadbir Sekolah

Aktiviti amali di sekolah akan menjadi lebih aktif dan berkesan sekiranya ada kesinambungan antara pihak pentadbir dengan tenaga pengajar. Bersesuaian dengan Falsafah Pendidikan Negara yang menginginkan usaha yang berterusan ke arah memperkembangkan lagi potensi individu secara menyeluruh dan bersepadu untuk mewujudkan insan yang seimbang dan harmonis dari segi intelek, rohani, emosi dan jasmani berdasarkan kepercayaan dan kepatuhan kepada tuhan.

Pihak pengurusan sekolah perlu memikir dan menyediakan suasana kerja dan pembelajaran yang selesa dan menyeronokkan di kalangan guru-guru dan pelajar dalam dunia pendidikan yang kini semakin rumit dan mencabar. Ia juga membantu saluran ilmu pengetahuan secara berterusan dan ia bertindak sebagai jambatan ilmu menghubungkan generasi lalu, kini dan masa akan datang. Pengagihan tugas atau kuasa akan mudah dijalankan dan orang lain akan mendapat peluang kemahiran dengan lebih berkesan jika

pengurusan ini dilaksanakan dengan cekap (Sanusi,1998).

2.2.5 Penerimaan Pelajar

Pelajar seharusnya berasa seronok mempelajari kemahiran-kemahiran sekiranya mereka didedahkan dengan bengkel dan peralatan yang mencukupi serta kecekapan guru dalam mengendalikan peralatan-peralatan bagi matapelajaran ini. Guru hendaklah menjalankan peranannya dengan sepenuh hati dan berdedikasi kerana ini akan menunjukkan penglibatan yang sebenar dalam pengajaran dan pembelajaran mata pelajaran ini yang melibatkan teori dan amali. Guru merupakan tonggak utama dan mempunyai tanggungjawab yang besar dalam perlaksanaannya.

Walaupun bagaimanapun sekiranya segala keperluan bahan pengajaran dan pembelajaran untuk pelajar seperti buku teks, bengkel yang sempurna dan lengkap, peralatan yang mencukupi dan segala keperluan lain yang dirasakan perlu telah siap sedia, ini akan mempengaruhi minat dan penerimaan pelajar terhadap matapelajaran Kemahiran Hidup. Ini kerana, matapelajaran ini merupakan satu matapelajaran yang unik dan boleh menarik minat pelajar seandainya ia digarapkan dengan kesediaan guru dan kesungguhan mereka mengeksploitasi bahan terbuang dan bahan yang telah sedia ada untuk pelajar merekacipta dan menghasilkan barangan atau benda buatan mereka sendiri.

2.3 Teori-teori Pembelajaran

Teori-teori pembelajaran merujuk kepada prinsip-prinsip dan hukum-hukum pembelajaran yang dihasilkan daripada kajian ahli-ahli psikologi pendidikan. Melalui teori-teori pembelajaran ini, guru akan memahami pelbagai cara pelajar-pelajar belajar dan seterusnya menghubungkan prinsip dan hukumnya dengan kaedah dan teknik mengajar untuk mencapai objektif pelajaran dengan berkesan. Pembelajaran berlaku apabila manusia, termasuk murid muda, dari semasa ke semasa mengubah kefahaman

dalam mereka tentang dunia semasa mereka menemui bukti luaran yang bercanggah dengan kefahaman awal mereka.

Lima teori pembelajaran iaitu teori behavioris, teori kognitif, teori pembelajaran sosial, teori humanistik dan teori konstruktivisme. Lima aspek yang berkaitan dengan proses pembelajaran iaitu kesediaan, corak pengamatan, persepsi, ingatan dan lupa serta pemindahan pembelajaran.

2.4 Konsep Pemikiran Kreatif Dan Inovatif

Cadangan kerajaan untuk menstrukturkan semula system pendidikan dengan menumpukan kepada perkembangan potensi pelajar secara holistik dengan memberi tumpuan kepada penerokaan pelbagai ilmu menerusi proses pembelajaran menyeronokkan dan tidak berorientasikan peperiksaan adalah tindakan tidak wajar. Budaya kreatif dan inovasi yang digerakkan menerusi minda itu perlu terus dipupuk, disemai serta dicanai kepada masyarakat di negara ini seawal usia muda, khususnya kepada pelajar peringkat sekolah lagi.

Program seperti bengkel, seminar, kem, makmal inovasi, pusat sumber inovasi serta penganjuran pertandingan yang mencetuskan idea ahli kelab dalam bidang rekacipta dan inovasi perlu dianjurkan dari semasa ke semasa.

Oleh itu, penilaian murid sekarang lebih didasarkan kepada pencapaian akademik menerusi sukatan pelajaran yang berbentuk tipikal itu perlu dirombak supaya kebolehan mereka dalam pelbagai bidang mampu digilap untuk menjadikan mereka lebih professional dan sekaligus mampu menjadi penggerak ekonomi negara.

2.5 Pemasalahan Yang Dihadapi Dalam Pelaksanaan Kemahiran Hidup Sekolah Rendah

Keperluan manusia semakin berubah dari sehari ke sehari. Rekacipta menjadi semakin penting kerana memenuhi permintaan masyarakat yang menjadi semakin kompleks. Bagi memenuhi permintaan masyarakat ini, para perekacipta perlu bersifat lebih professional, kreatif dan inovatif. Malah, rekacipta sudah mula menjadi sebagai kerjaya yang tersendiri. Sebagai contoh, penciptaan kereta zaman ini merupakan satu perkembangan daripada rekaan yang lebih awal. Teknologi motor telah menjadi semakin maju yang membawa kecekapan, ekonomi serta ciri keselamatan yang lebih baik.

Evolusi dalam rekacipta dapat dilihat dalam penemuan-penemuan dan perkembangan-perkembangan dalam sains dan teknologi. Perubahan dalam rekacipta dapat ditonjolkan contohnya persekitaran tempat tinggal yang lebih baik dan berkualiti. Semua evolusi yang akan dihadapi ini, perlu dimulakan dari peringkat sekolah rendah lagi bagi memastikan mereka bersedia menghadapinya di masa hadapan.

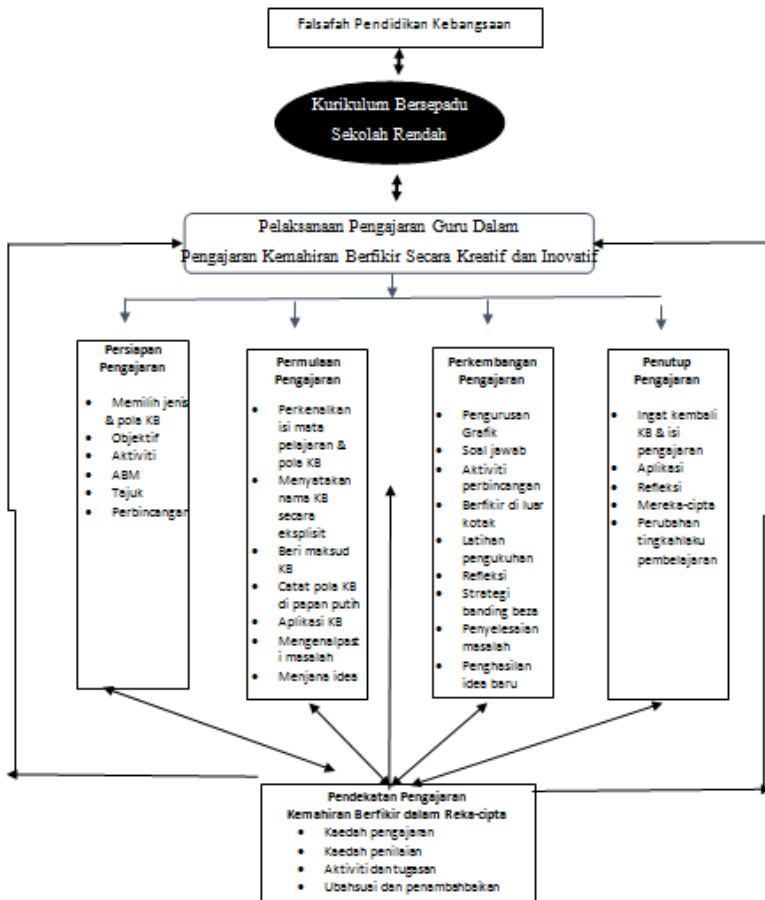
2.6 Pendekatan Kualitatif

Satu pendekatan kajian untuk mengumpulkan data-data penyelidikan dengan menggunakan pemerhatian, temubual mendalam dan bukti dokumen bahan pengajaran dan pembelajaran. Jenis pemerhatian yang digunakan adalah pemerhatian tidak turut serta melibatkan pengkaji duduk di sudut tertentu dalam kelas atau bengkel bagi mencatat amalan-amanah guru yang melaksanakan pengajaran

Kemahiran berfikir tanpa mengambil bahagian dalam aktiviti-aktiviti pengajaran yang sedang berlangsung (Spradley, 1980). Temubual secara mendalam dilakukan selepas sesi pemerhatian di tamatkan bagi mendapatkan penjelasan

terperinci mengenai amalan-amalan guru yang telah diperhatikan. Dokumen pembelajaran dan pengajaran yang dimaksudkan pula merangkumi Buku Rekod Mengajar Guru, minit mesyuarat Panitia Kemahiran Hidup, buku nota atau latihan pelajar dan pengurusan grafik. Oleh itu pendekatan kualitatif yang digunakan oleh pengkaji dalam penyelidikan ini merujuk kepada gabungan tiga kaedah untuk mengumpulkan data dan penyemakan dokumen dalam pengajaran dan pembelajaran.

4.0 KERANGKA KONSEPTUAL



5.0 KESIMPULAN

Inovasi dan kreativiti merupakan penyumbang ke arah perubahan organisasi, perkembangan dan pembangunan negara. Bagi menghasilkan sebuah organisasi pembelajaran yang kreatif dan inovatif faktor-faktor yang perlu diberi perhatian ialah pengurusan organisasi, kepimpinan, budaya, teknologi, pemikiran, strategi pembelajaran, penyelesaian masalah dan juga komunikasi terbuka.

Kreativiti dan inovasi yang dibentuk atau dibina perlulah

bersesuaian dengan keperluan dan kehendak masyarakat, individu dan juga negara. Ianya juga hendaklah bebas daripada sebarang kebimbangan dan ketakutan yang merupakan pra syarat untuk mengembangkan potensi pelajar yang seharusnya mempunyai daya kreativiti dan inovasi yang aktif dan berdaya maju. Individu yang bersifat kreatif dan inovatif perlu diganjar dengan sepatutnya supaya bakat yang ada tidak dipersiapkan begitu sahaja.

Bagi guru yang kreatif dan inovatif pula, mereka harus sentiasa mengkaji dan menyelidik apa yang berfungsi dan tidak berfungsi dalam profesion mereka. Mereka perlu menanya beberapa persoalan dengan diri mereka. Persoalan-persoalan tersebut seharusnya bertumpu bagaimana untuk merealisasikan Model Konseptual Pengajaran Reka Cipta Sekolah Rendah Berdasarkan Teori Pemikiran Kreatif Dan Inovatif.

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**KERANGKA KONSEP
PEMBELAJARAN TERADUN
DALAM PERSEKITARAN
VISUAL-AUTENTIK BAGI
MENYOKONG KEMAHIRAN
INSANIAH PELAJAR**

Muhammad Syahir Ghani & Noor Azean Atan

ABSTRAK

Isu pengangguran dan sosio ekonomi sesuatu komuniti penduduk telah menjadi satu cabaran kepada kerajaan. Pihak kerajaan tidak dapat menyediakan peluang pekerjaan sepenuhnya kepada sesebuah komuniti secara keseluruhan.. Telah banyak aduan, rungutan, kenyataan serta keluhan didengari dan tidak kurang juga langkah-langkah, saranan serta gesaan yang telah dibuat oleh kerajaan, individu dan persatuan-persatuan berkaitan. Namun jawapan secara tuntas masih belum diperolehi. Walaupun begitu satu langkah yang dilihat praktikal disarankan bagi mengatasi kemelut isu sosio ekonomi ini iaitu dengan memperluaskan kesedaran didalam kerjaya keusahawanan melalui peranan yang di mainkan oleh Kolej Komuniti Kementerian Pendidikan Malaysia melalui pendekatan kursus pendek. Tahap pendidikan golongan sasaran bukanlah satu isu yang perlu diutamakan. Masing-masing mempunyai tempat, kaedah dan peranan didalam menjayakan proses keusahawanan. Data-data yang diambil bagi memperlihatkan hal-hal berkaitan keusahawan boleh membantu untuk memperkasakan strategi kearah menjayakan keusahawanan ini. Seterusnya cadangan-cadangan yang positif boleh diketengahkan dan diperhalusi. Diharap usaha untuk memperkasakan kemahiran dan penglibatan dalam bidang keusahawanan dikalangan golongan sasaran dapat mengatasi isu penting iaitu pengangguran dan sosio ekonomi di semua pelusuk komuniti negara kita.

1.1 PENGENALAN

Pembelajaran yang melibatkan penggunaan teknologi menjadikan pelajar bersikap lebih aktif dan bertanggungjawab terhadap

pembelajaran mereka. Konsep pembelajaran bertumpukan kepada pelajar menerusi penerapan elemen teknologi dijangka melahirkan graduan yang lebih bertanggungjawab, mempunyai keupayaan berkomunikasi dalam kalangan pelajar, menyokong pembelajaran berterusan, memupuk diri pelajar dalam menyelesaikan sesebuah masalah pembelajaran dengan lebih terbuka dan kritikal, berdikari, membentuk sikap proaktif, mendidik nilai beretika dan berintegriti serta menggalakkan pelajar untuk berkolaborasi dalam proses pembelajaran (Rafiza, 2013). Hal ini secara tidak langsung mampu membantu membentuk kemahiran insaniah dalam kalangan pelajar sebagaimana yang diperlukan semasa alam kerjaya mereka nanti.

Menurut laman sesawang Universiti Teknologi Malaysia (2014), industri pekerjaan hari ini mementingkan nilai tambah yang sesuai dalam kalangan graduan sebagai elemen utama dalam pemilihan

pekerja baru atau proses kenaikan pangkat seseorang pekerja. Perkara sama turut disokong oleh Kementerian Pengajian Tinggi Malaysia (2014) menerusi langkah memperkenalkan tujuh elemen Kemahiran Insaniah yang harus diterapkan semasa mereka berada di dalam kampus lagi. Kepentingan kemahiran ini bukan sahaja terhadap kepada keperluan industri semata-mata, ianya turut penting kepada seluruh mahasiswa yang rata-rata mempunyai hubungan serta tanggungjawab besar terhadap masyarakat luar baik semasa berada di universiti atau setelah bergraduasi kelak (Zamri & Noor Syazwani, 2013).

Adalah menjadi tanggungjawab pihak universiti, khususnya tenaga pengajar menerapkan elemen kemahiran insaniah dalam diri pelajar mereka (Shazli H. Khan, 2013) dengan sokongan kaedah pengajaran dan pembelajaran yang sesuai. Terdapat berbagai bentuk kaedah pengajaran dan pembelajaran yang telah diperkenalkan dalam institusi pendidikan termasuklah kaedah P&P yang dijalankan secara tradisional mahupun secara konvensional (Siew Min Thang *et al.* 2013). Ringkasnya kaedah P&P secara konvensional menerapkan elemen teknologi sebagai salah satu medium utama penyampaian maklumat serta alat bantu mengajar guru serta pensyarah. Walaubagaimanapun, Noor Azean (2012)

menjelaskan bahawa pembelajaran yang dijalankan berteraskan teknologi hendaklah diberikan penjelasan dan arahan yang tepat agar tidak berlaku sebarang salah faham terhadap arahan atau maksud pembelajaran yang berlangsung.

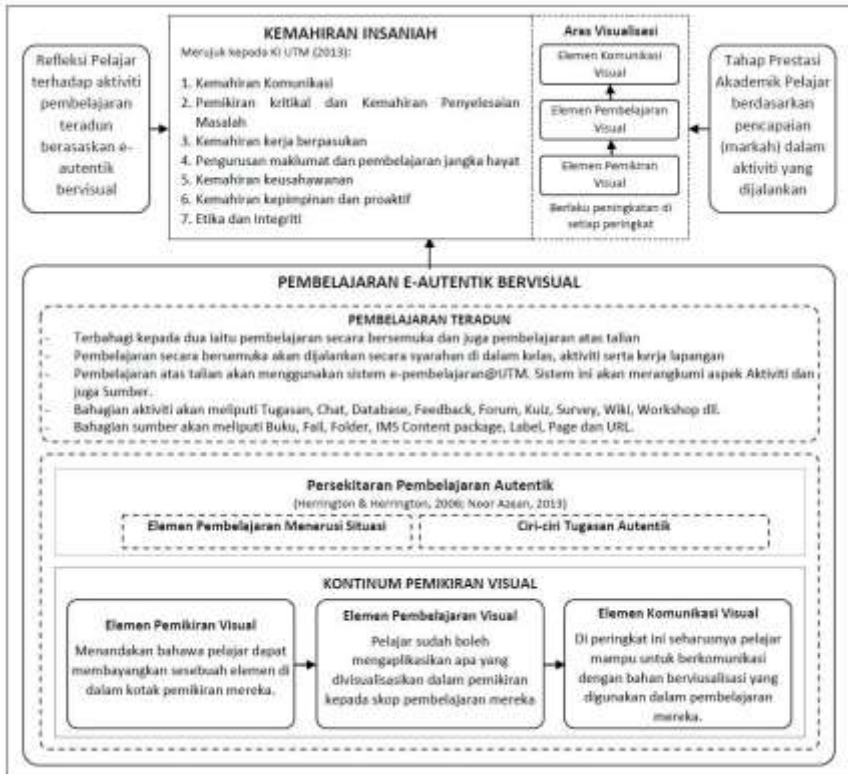
Bagi memastikan keseimbangan antara keperluan pendidikan serta proses penerapan kemahiran insaniah dalam diri pelajar disamping pengintegrasian teknologi yang efektif, pembelajaran teradun dilihat sebagai kaedah pembelajaran terbaik memandangkan kaedah pembelajaran ini memberi penekanan terhadap kedua-dua aspek iaitu pembelajaran secara atas talian dan pembelajaran secara bersemuka (face-to-face) (Kristin Kipp, 2013). Justeru berdasarkan kepada perbincangan diatas, maka sebuah penyelidikan berkenaan pembelajaran teradun yang melibatkan aktiviti pembelajaran dalam kelas dan penggunaan e-Pembelajaran yang telah dibangunkan oleh Universiti Teknologi Malaysia dengan beberapa penambah baikkan sebagai medium utama pembelajaran atas talian yang menyokong kepada kaedah pembelajaran teradun dalam persekitaran e-autentik bervisual akan dijalankan.

Berdasarkan kepada aktiviti yang direka bentuk, penyelidik akan mengenal pasti keberkesanan aktiviti pembelajaran teradun dalam persekitaran autentik bervisual terhadap tahap prestasi akademik pelajar serta mengukur aras perkembangan kemahiran insaniah pelajar yang terdiri daripada kemahiran komunikasi, pemikiran kritikal dan kemahiran penyelesaian masalah, kemahiran kerja secara berpasukan, pengurusan maklumat dan pembelajaran jangka hayat, kemahiran keusahawan, kemahiran kepimpinan dan proaktif serta etika dan integriti. Seterusnya kajian ini bakal menilai tahap perkembangan aras visualisasi pelajar terhadap aktiviti pembelajaran teradun menerusi aktiviti pembelajaran e-autentik bervisual serta mendapatkan refleksi pelajar terhadap aktiviti pembelajaran yang dijalankan. Walau bagaimanapun, dalam kertas kerja konseptual ini, reka bentuk serta pembangunan aktiviti pembelajaran menerusi e-Pembelajaran@UTM tidak dibincangkan.

1.2 KERANGKA KONSEPTUAL PENYELIDIKAN

Penyelidikan ini dibina berteraskan kepada konsep pembelajaran teradun yang terdiri daripada gabungan pembelajaran secara bersemuka dan pembelajaran secara atas talian yang dijalankan menggunakan pengintegrasian e-Pembelajaran di Universiti Teknologi Malaysia. Proses pengajaran dan pembelajaran secara bersemuka adalah melibatkan aktiviti pembelajaran dalam kelas seperti kuliah, aktiviti berkumpulan, tugas individu serta berkumpulan, aktiviti serta tugas lapangan. Bagi memudahkan pemahaman terhadap konsep penyelidikan ini, satu bentuk kerangka konseptual telah dibina.

Secara asasnya kerangka konseptual ini terdiri daripada dua bahagian utama iaitu konsep pengajaran dan pengajaran yang diwakili oleh Pembelajaran e-Autentik Bervisual serta bahagian jangkaan dapatan penyelidikan. Berikut adalah gambaran rajah kerangka konseptual bagi penyelidikan ini.



Rajah 1: Kerangka konseptual penyelidikan

Sepertimana yang dijelaskan dalam Rajah 1, konsep pengajaran dan pembelajaran terbahagi kepada beberapa pecahan utama iaitu bentuk pembelajaran teradun yang diterapkan, persekitaran pembelajaran autentik serta kontinum pemikiran visual. Gabungan daripada tiga elemen ini telah membentuk satu kaedah pengajaran dan pembelajaran yang diberi nama Pembelajaran e-Authentik Bervisual. Penerangan serta perbincangan terperinci berkenaan elemen yang terdapat dalam konseptual pengajaran dan pembelajaran diterangkan dalam sub seterusnya.

Bahagian jangkaan dapatan penyelidikan pula menjelaskan bahawa pembangunan kemahiran insaniah yang cuba dicapai hendaklah seiring dengan prestasi akademik responden serta refleksi mereka terhadap kaedah pengajaran dan pembelajaran

yang diterapkan. Merujuk kepada Rajah 1, selain daripada berlakunya perkembangan kemahiran insaniah pelajar, sepatutnya turut berlaku peningkatan dalam aspek aras visualisasi pelajar secara tidak langsung meskipun elemen ini tidak diukur secara terus, namun peningkatan ini hendaklah berlaku sewajarnya memandangkan persekitaran pembelajaran autentik serta kontinum pemikiran visual diterapkan dalam kaedah pengajaran dan pembelajaran yang telah dirangka.

Perbincangan dan penerangan berkenaan dengan kemahiran insaniah, pembelajaran teradun, pembelajaran autentik dijelaskan dalam sub seterusnya dari sudut pandang definisi atau pengkelasan, keperluan serta kepentingan, kebaikan dan kelebihan serta konsep berkait antara setiap elemen.

1.2.1 Elemen Kemahiran Insaniah

Kemahiran insaniah adalah satu bentuk nilai tambah yang seharusnya dimiliki khususnya graduan universiti sebelum mereka menempatkan diri mereka kealam pekerjaan kelak (Mohd Lazim, 2009). Secara ringkasnya terdapat pelbagai definisi yang diketengahkan dalam menerangkan kemahiran insaniah ini selain ianya turut dikenali dengan beberapa istilah lain seperti kemahiran generik atau kemahiran kerjaya (Zamri & Noor Syazwani, 2013).

K. Barac menyatakan kemahiran insaniah adalah kemahiran sampingan yang menjadi keperluan graduan dalam memudahkan urusan kerjaya mereka kelak. Tambah Zamri dan Noor Syazwani (2013) dan Vijaya Kumari S.N (2014), kemahiran insaniah ini adalah merupakan suatu kemahiran yang bukan sahaja tertumpu kepada bidang pengajian semata-mata bahkan lebih luas daripada iatu ianya turut meliputi aspek kemahiran untuk berdepan dengan situasi luar jangka.

Terdapat tujuh kemahiran insaniah telah dikategorikan oleh Kementerian Pengajian Tinggi (2014) sebagaimana berikut:

- i. Kemahiran komunikasi
- ii. Pemikiran kritis dan kemahiran penyelesaian masalah

- iii. Kemahiran kerja secara berpasukan
- iv. Kemahiran kepimpinan
- v. Pembelajaran berterusan dan pengurusan maklumat
- vi. Kemahiran keusahawanan
- vii. Moral dan etika professional

Ketujuh-tujuh kemahiran ini hendaklah diterapkan dalam sesi pengajaran dan pembelajaran seiring dengan perkembangan akademik pelajar. Penyelidikan ini bagaimanapun akan melihat kepada kemahiran komunikasi, kemahiran kepimpinan, kemahiran kerja berpasukan dan pemikiran kritis serta kemahiran penyelesaian masalah sesuai dengan kehendak industri dan keperluan semasa serta dapatan yang bakal didapati menerusi kajian awal yang dijalankan. Kemahiran-kemahiran ini penting untuk diterapkan dalam diri bakal graduan melihatkan kepada situasi dimana industri hari ini memandang berat perkara ini (Muhammad Nubli dan Zarina, 2005). Ia turut disokong oleh Nurita Juhdi (2006) yang menyatakan bahawa berlakunya peningkatan dalam kadar pengangguran disebabkan oleh sikap graduan yang kurang memenuhi kriteria pekerjaan yang ditawarkan.

1.2.2 Konsep Pembelajaran Teradun

Gabungan antara dua kaedah pengajaran dan pembelajaran iaitu kaedah pembelajaran secara bersemuka dengan kaedah pembelajaran secara atas talian dipanggil sebagai pembelajaran teradun (Kristin Kipp, 2013). Sebagai contoh, kajian yang dijalankan oleh Siew Min Thang et al. (2013) yang menggabungkan kaedah pembelajaran secara atas talian menerusi penggunaan *Courses Book* dengan aktiviti pembelajaran dalam kelas. Manakala Manoj B. & Prakash G. (2011) pula menggabungkan kaedah pengajaran ini dengan aktiviti pembelajaran dalam kelas dengan pembelajaran menerusi penggunaan e-pembelajaran.

Ringkasnya, pembelajaran teradun hendaklah melibatkan kaedah pembelajaran bersemuka samada aktiviti dalam kelas atau kerja lapangan dimana pelajar dan pensyarah boleh berhubung secara terus dan aktiviti pembelajaran yang dijalankan secara atas talian samada menerusi penggunaan laman sosial (*facebook, twitter*) atau laman web interaktif atau e-pembelajaran. Walaubagaimanapun, bagi memastikan kejayaan sesebuah pengajaran yang dijalankan samada secara atas talian atau secara bersemuka hendaklah menggunakan kaedah yang betul dan sesuai dengan responden serta bahan penyelidikan agar pengajaran dan pembelajaran yang dijalankan adalah berkesan dan sesuai untuk dipraktikkan (Sidney R.C & Chad J.M, 2010). Kamaruzzaman dan Rouhullah K (2009) jturut menyatakan bahawa penglibatan sosial (hubungan) adalah perlu bagi menggalakkan keberlangsungan aktiviti pengajaran dan pembelajaran yang dijalankan samada secara atas talian atau secara bersemuka.

Mengambil kira beberapa faktor yang dibincangkan, penyelidikan ini dijalankan dengan menggabungkan aktiviti pembelajaran bersemuka seperti kuliah, tugas individu, tugas berkumpulan serta kerja lapangan dengan pembelajaran dan pengajaran yang dijalankan secara atas talian menerusi aplikasi e-Pembelajaran yang disediakan oleh pihak Universiti Teknologi Malaysia.

1.2.2.1 E-Pembelajaran di Univeristi Teknologi Malaysia

Penggunaan e-Pembelajaran terbukti bukan sahaja mampu membantu pelajar untuk tampil lebih meningkat dari sudut akademik, bahkan dari aspek lain juga (Jean A & Gareth M, 2007). Ia disokong oleh Murat H. (2011) yang menyatakan penggunaan e-Pembelajaran mampu meningkatkan perkembangan komunikasi dan pengetahuan dalam kalangan pelajar. Beliau turut menyatakan bahawa penggunaan e-Pembelajaran ini mampu meningkatkan kesedaran pelajar terhadap perbezaan dan perkembangan sistem pembelajaran di luar negara. Seterusnya Noraffandy dan Ling NN

(2011) menyatakan e-Pembelajaran telah membantu pelajar dalam sesi pembelajaran mereka serta mampu meningkatkan motivasi pelajar untuk tampil menonjol dalam akademik mereka.

Sesuai dengan konsep penyelidikan, penyelidik memilih untuk mengguna pakai sistem sedia ada yang diperkenalkan oleh Universiti Teknologi Malaysia memandangkan sistem e-Pembelajaran ini bukan sahaja mempunyai kelebihan dan keberkesannya yang tersendiri bahkan sistem yang dibekalkan ini memenuhi kehendak serta kriteria dimana pembelajaran teradun berlangsung. Antara ciri yang diketangahka oleh e-Pembelajaran di UTM adalah pembahagian elemen Sumber dengan Aktiviti dimana diruangan Aktiviti, pelajar diminta terlibat dengan aktiviti seperti forum, chat, tugas serta lain-lain manakala bahagian sumber membekalkan informasi kepada pelajar menerusi aplikasi seperti buku, nota, alamat lawan sesawang dan lain-lain.

1.2.3 Suasana Pembelajaran Autentik

Selain dari itu, Noor Azean (2012); Herrington J. dan Herrington A. (2006) menyatakan sesebuah pembelajaran hendaklah dijalankan dalam keadaan yang bermakna dan sesuai dengan diri pelajar selain memberi pengalaman sebenar dan meningkatkan motivasi pelajar untuk terus memberi tumpuan terhadap sesi pengajaran dan pembelajaran yang dijalankan. Justeru penerapan suasana pembelajaran autentik dimana pelajar diberi ruang untuk merasai pengalaman sebenar sesebuah pembelajaran meskipun hanya dari dalam kelas adalah sesuai untuk diintegrasikan secara bersama dengan pembelajaran teradun (Naps et *al.*, 2003).

Muhammad Syahir dan Noor Azean (2013) menjelaskan bahawa persekitaran pembelajaran autentik hendaklah disertakan dengan penggunaan bahan bervisual serta diterapkan dengan elemen pembelajaran menerusi situasi. Sesuai dengan saranan daripada Noor Azean (2012) serta Herrington (2004) yang menjelaskan bahawa suasana pembelajaran autentik ini hendaklah terdiri daripada elemen pembelajaran menerusi situasi bagi

mewujudkan pengalaman sebenar kepada pelajar serta dikukuhkan dengan tugas yang mempunyai ciri-ciri autentik sebagaimana berikut:

Elemen Pembelajaran Menerusi Situasi

- i. Menghasilkan konteks autentik di mana menunjukkan cara ilmu pengetahuan akan digunakan dalam kehidupan sebenar
- ii. Menghasilkan aktiviti-aktiviti autentik
- iii. Menghasilkan akses untuk pelaksanaan yang baik dan proses memodelkan / peniruan kepada konsep sebenar
- iv. Menghasilkan pelbagai peranan dan perspektif
- v. Menyokong pengetahuan dalam membentuk kolaboratif
- vi. Menggalakkan refleksi
- vii. Menggalakkan artikuasi
- viii. Menyediakan ruang coaching dan scaffolding
- ix. Menghasilkan penilaian pembelajaran autentik termasuk tugas

Ciri-ciri Tugas Autentik

- i. Tugas autentik hendaklah relevan dengan dunia sebenar
- ii. Tugas autentik adalah bersifat terbuka
- iii. Tugas autentik mengandungi tugas yang kompleks
- iv. Tugas autentik memberi ruang kepada pelajar untuk mengenalpasti dan mengkaji tugas dari pelbagai sudut perspektif
- v. Tugas autentik memberi peluang kepada pelajar untuk berkolaborasi
- vi. Tugas autentik memberi peluang untuk pelajar membuat refleksi
- vii. Tugas autentik boleh diintegrasikan dan diaplikasikan merentas disiplin subjek
- viii. Tugas autentik adalah integrasi menyeluruh bersama dengan penilaian
- ix. Tugas autentik menghasilkan produk yang bernilai dan bermakna
 - x. Tugas autentik membenarkan kepelbagaian hasil dan persaingan

Suasana pembelajara autentik ini juga turut disokong dengan kontinum pemikiran visual sebagaimana yang dinyatakan oleh Noor Azean (2012) dan Herrington (2004) serta kontinum ini terbahagi kepada tiga elemen utama.

1.2.3.1 Kontinum Pemikiran Visual

Tiga elemen tersebut adalah elemen pemikiran visual yang seterusnya meningkat kepada elemen pembelajaran visual dan akhir sekali elemen komunikasi visual (Muhammad Syahir & Noor Azean, 2013). Ketiga-ketiga ini saling berkait dan meningkat dari satu tahap ke tahap yang lebih tinggi. Semasa di peringkat pemikiran visual, pelajar mula membayangkan sesebuah permasalahan dalam minda mereka dan seterusnya mengubah pemikiran tersebut kepada elemen pembelajaran di mana pelajar mula mengaplikasikan pelajaran dan digambarkan dalam minda mereka ke dunia nyata. Ini boleh dilihat menerusi penggunaan bahan bervisual yang diturut diterapkan dalam suasana pembelajaran autentik ini. Setelah berjaya menggambarkan dan menterjemahkan gambaran ke dunia nyata, pelajar bakal melalui tahap yang terakhir iaitu berkomunikasi bahan bervisual tadi. Di peringkat ini, pelajar perlu menerangkan apa yang cuba disampaikan menerusi gambaran yang telah dibuat sebelum ini (Naps T. L. et al., 2003a; Naps T.L. et al.; Noor Azean, 2012; Muhammad Syahir & Noor Azean, 2013). Justeru, dengan adanya penerapan dan pengintegrasian suasana pembelajaran autentik ke dalam kaedah pembelajaran teradun, adalah diharapkan pelajar lebih bermotivasi, bersemangat untuk mengikuti setiap aktiviti pengajaran dan pembelajaran yang dirangka.

1.3 PERBINCANGAN DAN KESIMPULAN

Kemahiran insaniah pelajar dapat dibentuk dengan baik sekiranya terdapat saluran serta kaedah yang baik. Adalah

diharapkan penyelidikan ini mampu memberi kesan positif kepada pelajar yang mengikuti aktiviti pembelajaran ini nanti. Perkembangan insaniah dalam penyelidikan ini turut disokong dengan perkembangan aras visualisasi pelajar yang mampu meningkat dengan adanya pengimplementasian persekitaran pembelajaran autentik bervisual. Memandangkan penyelidikan turut melibatkan bukan sahaja kaedah pembelajaran teradun bahkan turut melibatkan aplikasi e-Pembelajaran di Universiti Teknologi Malaysia, jadi diharap kajian ini turut memberi kesan positif kepada amalan pengajaran dan pembelajaran univerviti serta pelajar.

Semoga penyeldidikan ini berjalan lancar dan mampu meningkatkan kemahiran insaniah seterusnya berkembang dengan baik seiring dengan perkembangan aras visualisasi dan prestasi akademik pelajar menerusi pengintegrasian e-Pembelajaran@UTM dalam pembelajaran menerusi persekitaran pembelajaran autentik bervisual.

1.4 PENGHARGAAN

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KONSTRUK REKABENTUK BERBANTU KOMPUTER DALAM PENJANAAN IDEA INOVASI

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ABSTRAK

Asas kepada pembinaan instrumen iaitu Jadual Spesifikasi Konstruk (JSK) Rekabentuk Berbantu Komputer (RBK) dan hubungannya dengan penjanaaan idea inovasi dalam rekabentuk produk telah dibina berdasarkan teori-teori penjanaaan idea, definisi operasi dan sumber kajian-kajian terdahulu dari dalam dan luar negara. Kajian awal melalui pemerhatian, kajian literatur, temubual berstruktur telah dijalankan untuk mengenalpasti konstruk-konstruk dalam RBK yang mempunyai hubungan dengan penjanaaan idea inovasi dalam rekabentuk produk diperingkat awal proses rekabentuk produk. Kesahan JSK adalah daripada dua orang pakar bidang RBK dan kemudiannya dianalisis menggunakan kaedah *Cohen Kappa*. Pekali persetujuan yang diperolehi adalah pada ukuran $k = .786$ (92%, $p < .0005$) iaitu pada tahap baik untuk digunakan sebagai asas kepada instrumen yang akan dibina. Kajian rintis secara kualitatif dengan kaedah '*think aloud protocol*' kemudiannya telah dijalankan terhadap empat pelajar kejuruteraan mekanikal di salah sebuah Kolej Komuniti KPM yang menggunakan RBK dalam proses rekabentuk produk bagi menentukan konstruk dan sub konstruk serta hubungannya dengan penjanaaan idea inovasi. Konstruk-konstruk dalam RBK yang dikenalpasti adalah terdiri dari empat konstruk utama iaitu *pembinaan model pepejal*, *simulasi model*, *manipulasi model* dan *visualisasi model*. Dapatan kajian mendapati empat konstruk tersebut kerap digunakan dalam RBK yang terbukti berpotensi dapat menjana

idea-idea inovasi dalam rekabentuk produk.

(Kata kunci: Penjanaan Idea, Rekabentuk Berbantu Komputer – *RBK*, Produk Inovasi, Jadual Spesifikasi Konstruksi-*JSK*)

PENGENALAN

Keupayaan RBK untuk digunakan diperingkat awal proses rekabentuk selain daripada kaedah lakaran tradisional untuk menjana idea sering diperdebatkan sejak akhir-akhir ini. Sejak bermulanya penggunaan RBK dalam rekabentuk produk bagi menggantikan kaedah konvensional (kertas dan papan lukisan), RBK dikatakan tidak sesuai sebagai medium penjanaan idea diperingkat awal proses rekabentuk produk (Bilda & Demirkan, 2003). Hal ini adalah kerana fasilitinya hanya sesuai untuk kegunaan diperingkat akhir proses rekabentuk iaitu untuk perincian dan dokumentasi produk (Veisz, Namouz, Joshi, & Summers, 2012).

Medium terbaik untuk menjana idea-idea inovasi diperingkat awal proses rekabentuk adalah dengan menggunakan kaedah tradisional iaitu dengan lakaran tangan (Van Elsas & Vergeest, 1998). Namun begitu, terdapat beberapa kelemahan menggunakan lakaran tangan dalam menjana idea inovasi iaitu dari segi persembahan idea yang terlalu ringkas dan tidak berstruktur di mana lakaran tidak dapat menunjukkan fungsi sesuatu produk dan tahap kualiti imej produk yang direkabentuk terutama bagi produk yang berasaskan mekanikal (Kudrowitz, Te, & Wallace, 2012; Oman, Tumer, Wood, & Seepersad, 2012).

Sehubungan dengan itu, peranan penjanaan idea dengan menggunakan kaedah RBK dilihat lebih sesuai kerana keupayaan RBK yang dapat mensimulasikan produk diperingkat konsep dan menunjukkan fungsi produk sebelum ianya diputuskan diperingkat akhir rekabentuk (Ismail, Mahmud, & Hassan, 2012; Musta'amal & Fairus, 2012; Séquin, 2005). Selain

daripada itu, menggunakan RBK diperingkat awal proses rekabentuk dapat meningkatkan visualisasi dan komunikasi kerana RBK mempunyai fasiliti yang berupaya menterjemahkan idea perekabentuk secara maya melalui paparan grafik seakan produk sebenar sebelum ianya dihasilkan diperingkat akhir rekabentuk (Hodgson, 2008; Brett F. Robertson, Walther, & Radcliffe, 2007). Berdasarkan kelebihan RBK diperingkat rekabentuk konsep, penyelidik cuba mengkaji serta meneroka bagaimana jika RBK digunakan sebagai medium penjanaan idea untuk merekabentuk produk inovasi diperingkat awal proses rekabentuk produk selain daripada menggunakan kaedah lakaran tangan. Secara ringkasnya objektif utama dalam kajian ini adalah untuk menentukan konstruk dan sub konstruk yang terdapat dalam RBK yang berpotensi dapat menjana idea inovasi dalam rekabentuk produk melalui pemerhatian secara dekat dengan kaedah 'think aloud protocol'.

METODOLOGI KAJIAN

Rekabentuk Kajian

Asas dari pembinaan JSK ini adalah melalui dapatan kajian awal iaitu kajian-kajian literatur, pemerhatian secara dekat, temubual pakar, semakan dokumen pertandingan produk inovasi, dokumen pertandingan kemahiran RBK mekanikal dan adaptasi dari kajian-kajian lepas untuk mengenalpasti konstruk-konstruk yang terdapat dalam RBK yang berpotensi dalam penjanaan idea inovasi. Bagi mengesahkan setiap item-item dalam JSK ini, penyelidik telah menggunakan kesahan persetujuan dalaman kaedah *Cohen Kappa* iaitu kesahan yang memerlukan dua penilai pakar bidang RBK yang telah berpengalaman lebih daripada 10 tahun dalam pengajaran subjek rekabentuk di Institusi Pengajian Tinggi (Ahmed, 2007)

Jadual 1: Skala persetujuan Cohen Kappa

Kappa (K)	Interpretasi
$K < 0.00$	Sangat Lemah
$0.00 < k < 0.20$	Lemah
$0.21 < k < 0.40$	Sederhana
$0.41 < k < 0.60$	Lemah
$0.61 < k < 0.80$	Sederhana
$0.81 < k < 1.0$	Baik Sangat Baik

Penyelidik menggunakan perisian SPSS versi 19 untuk mendapatkan nilai pekali k . Berdasarkan Jadual 2, pekali k Cohen Kappa yang diperolehi adalah $k = .786$ (92%, $p < .0005$). Merujuk Jadual 1 oleh Rust & Cooil, (1994) konstruk-construct yang terdapat dalam JSK yang dibina tergolong pada tahap kebolehppercayaan yang baik.

Jadual 2: Keputusan nilai kappa (k) persetujuan konstruk dalam RBK

	Valu e	Asymp. Std. Error ^a	Appr ox. T ^b	App rox. Sig.
Measure of Kappa Agreement a	.786	.206	4.895	.000
N of Valid Cases	37			

Berdasarkan keputusan, terdapat dua item daripada konstruk yang dibina digugurkan menjadikan hanya 35 konstruk dikekalkan dalam JSK tersebut.

Kajian Rintis

Kajian rintis dijalankan untuk mengenalpasti konstruk dan sub konstruk dalam RBK yang dapat mempengaruhi penjanaaan idea inovasi berdasarkan JSK yang telah dibina. Patton, (1990) berpendapat bahawa penggunaan kaedah kualitatif akan memberikan pemahaman terperinci mengenai keadaan sebenar yang berlaku dalam sesebuah kajian pendidikan yang bercorak eksplorasi.

Seramai empat orang pelajar kejuruteraan mekanikal di salah sebuah Kolej Komuniti di zon utara telah dipilih sebagai partisipan kajian. Pelajar terlibat telah mengambil subjek Rekabentuk Berbantu Komputer 3D (RBK3D) pada semester tersebut. Pelajar ini dipilih berdasarkan pencapaian mereka yang baik berdasarkan kemahiran menggunakan RBK di dalam kelas menurut pandangan pensyarah dan bukti-bukti penilaian terhadap subjek rekabentuk yang disemak oleh penyelidik. Bagi tujuan rujukan, partisipan kajian kemudiannya diberikan kod pengenalan seperti berikut iaitu P01, P02, P03 dan P04.

Kajian secara pemerhatian secara mendalam dengan menggunakan kaedah 'think aloud protokol' digunakan untuk mengenalpasti elemen-elemen penjanaaan idea apabila partisipan menggunakan RBK dalam rekabentuk produk. Kaedah ini paling sesuai digunakan untuk mengkaji bagaimana peserta berfikir dan melakukan kerja-kerja sintesis untuk menyelesaikan masalah rekabentuk (Nigel Cross, 1989). Satu instrumen lembaran kerja (LK) berasaskan masalah rekabentuk telah dibina oleh penyelidik berdasarkan soalan-soalan pertandingan rekabentuk produk inovasi telah diberikan kepada pelajar dalam kajian rintis ini. Perisian RBK yang digunakan partisipan dalam kajian ini adalah *Autodesk Inventor 2013* yang dilesenkan. Selain daripada itu, melalui pemerhatian secara dekat dengan kaedah 'think aloud protokol', penyelidik dapat mengenalpasti konstruk-konstruk dalam RBK yang kerap digunakan oleh peserta untuk menjana idea semasa merekabentuk produk.

KEPUTUSAN DAN PERBINCANGAN

Berdasarkan pemerhatian dan transkrip verbal melalui kaedah 'think aloud protocol' mendapati bahawa P01, P02, P03 dan P04 menggunakan empat konstruk yang terdapat dalam RBK untuk menjana idea semasa merekabentuk produk diperingkat awal proses rekabentuk. Jadual 3 menunjukkan kekerapan sub konstruk yang dicerap semasa pemerhatian secara mendalam dijalankan.

a) Pembinaan model pepejal

Jadual 3: Kekerapan penggunaan konstruk dikalangan partisipan.

Sub Konstruk RBK	P 0 1	P0 3	P0 2	P04	Jum lah
'extrude'	/	/	/	/	4
'revolve'	/	/	/	/	4
'Sweep'	/	/			2
'loft'				/	1
'primitive object'		/	/	/	2
'coil'	/	/	/	/	4
'general dimension'	4	5	4	5	
Jumlah					

Dari dapatan di atas dapat dirumuskan bahawa arahan 'extrude', 'revolve' dan 'general dimension' merupakan sub konstruk yang paling kerap digunakan dalam pembinaan model pepejal menggunakan RBK. Berdasarkan JSK, cetusan idea inovasi bermula dari pembinaan model yang tidak dijangka dan bersifat unik serta kreatif (Shah et al., 2000; Shah, Vargas-hernandez, Smith, & Gerkens, 2003). Kesemua partisipan menggunakan konstruk pembinaan model dalam RBK sebagai asas pembinaan produk inovasi.

b) Simulasi model

Jadual 4: Kekerapan penggunaan konstruk simulasi dalam RBK

Sub Konstruk RBK	P 0 1	P0 3	P0 2	P04	Jum lah
'animation'	/	/	/	/	4
'assembly'	/	/	/	/	4
Jumlah	2	2	2	2	

Berdasarkan dapatan kajian, konstruk simulasi model kerap digunakan oleh partisipan untuk menggambarkan kebolehfungsian produk yang dicipta. Antaranya ialah 'animation' dan 'assembly' yang dapat menunjukkan model yang dicipta dapat berfungsi seperti yang dikehendaki. Simulasi 'assembly' produk juga digunakan untuk menunjukkan pemasangan bahagian-bahagian produk yang direkabentuk. Antara ciri-ciri berkesan dalam penjanaaan idea inovasi adalah keupayaan produk konsep untuk menunjukkan fungsi kerja(Kudrowitz et al., 2012). Kelebihan ketara menggunakan RBK berbanding kaedah lakaran tangan diperingkat konsep ialah keupayaannya untuk menunjukkan fungsi produk yang akan dihasilkan. Hal ini dapat memberikan maklumat menyeluruh tentang fungsi sesuatu produk yang akan dihasilkan.

c) Manipulasi/ubahsuai model

Jadual 5: Kekerapan penggunaan konstruk manipulasi dalam RBK

Sub Konstruk RBK	P 0 1	P0 3	P0 2	P04	Jum lah
'general dimension'	/	/	/	/	4
'fillet'	/	/	/	/	4
'chamfer'				/	1

'hole features'	/	/			2
'cut features'			/	/	2
'shell features'				/	1
'work features'		/	/		2
'function tree'	/	/	/	/	4
Jumlah	4	5	5	6	

Arahan 'fillet', 'general dimension', dan function tree' merupakan sub konstruk yang paling kerap digunakan untuk mengubahsuai model yang direkabentuk dalam RBK. Konstruk ini digunakan untuk mengubahsuai produk yang dibina supaya dapat memenuhi kehendak rekabentuk iaitu salah satu ciri-ciri idea inovasi (Yilmaz, Seifert, & Gonzalez, 2010). Kelebihan RBK berbanding lakaran tangan ialah ianya dapat mengubahsuai produk sungguhpun ianya telah berada diperingkat akhir proses rekabentuk.

d) Visualisasi model

Jadual 6: Kekerapan penggunaan konstruk visualisasi dalam RBK

Sub Konstruk RBK	P 0	P0 3	P0 2	P04	Jum lah
	1				
'zoom in/out'	/	/	/	/	4
'color/texture'	/	/	/	/	4
'3D orbit'	/	/	/	/	4
'rotate'	/	/	/	/	4
'orthographic'	/	/	/	/	4
'isometric'	/	/	/	/	4
'view cube'		/	/		2
'rendering'					0
Jumlah	6	7	7	6	

Konstruk visualisasi dalam rajah di atas menunjukkan kekerapan yang tinggi digunakan oleh partisipan semasa membina model

rekabentuk. Hal ini menunjukkan bahawa idea inovasi dinilai secara berterusan melalui paparan grafik yang baik untuk melihat keseluruhan produk yang direkabentuk (B.F. Robertson & Radcliffe, 2009). Keupayaan RBK memaparkan model yang direkabentuk merupakan satu kelebihan dan elemen penting untuk menjana idea-idea kreatif dan inovatif dikalangan perekabentuk.

KESIMPULAN

Penggunaan RBK diperingkat awal proses rekabentuk didapati berpotensi untuk mempengaruhi penjanaan idea perekabentuk untuk menghasilkan produk inovasi. Terdapat empat konstruk dalam RBK yang dilihat dapat menjana idea-idea inovasi perekabentuk antaranya pembinaan model, manipulasi, simulasi dan visualisasi. Namun begitu, penilaian terhadap rekabentuk produk akhir oleh pakar sahaja yang dapat mengesahkan bahawa RBK dapat menjana idea-idea inovasi berbanding kaedah lakaran diperingkat awal proses rekabentuk. Kajian seterusnya adalah berbentuk eksperimen untuk perbandingan kaedah RBK dan tradisional dalam menjana idea-idea inovasi diperingkat awal proses rekabentuk produk.

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PENINGKATAN KOMPETENSI GURU MELALUI THE FIFTH DISCIPLINE

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ABSTRAK

Organisasi pembelajaran dijalankan sebagai garis panduan bagi guru di sekolah untuk mempertingkatkan kompetensi guru. Kajian ini bertujuan untuk mengenalpasti amalan organisasi pembelajaran terhadap peningkatan kompetensi guru. Model yang digunakan dalam organisasi pembelajaran ini adalah *The Fifth Discipline* yang merangkumi kepakaran peribadi, model mental, perkongsian visi, kumpulan belajar, dan sistem berfikir. *The Fifth Discipline* ini dibangunkan sebagai model yang dapat memberi input baru dan menarik bagi guru supaya mereka sentiasa belajar berterusan untuk mempertingkatkan kompetensinya. Kaedah yang digunakan dalam Kajian ini adalah mixed methode antara kaedah kuantitatif dan kaedah kualitatif. Kajian ini dijalankan di Sekolah Menengah Pertama distrik Sidenreng Rappang Sulawesi Selatan dengan jumlah responden seramai 500 guru. Dapat analisis yang dijalankan dengan menggunakan *SPSS18.0* menunjukkan bahawa terdapat hubungan yang signifikan ($r=.341, p<.05$) antara Organisasi Pembelajaran dan Kompetensi Guru. Hal ini menunjukkan bahawa hipotesis null (H_0) dalam kajian ini ditolak. Perkara ini menunjukkan bahawa pembolehubah bebas iaitu Organisasi Pembelajaran (X) dan pembolehubah bersandar (Y) memiliki hubungan positif terhadap peningkatan kompetensi guru di Sekolah Menengah Pertama distrik Sidenreng Rappang Sulawesi Selatan.

Key Words : *The Fifth Discipline, kompetensi guru, kepakaran*

peribadi, kumpulan belajar.

1.0 PENGENALAN

Sekolah adalah lembaga pendidikan formal yang sentiasa mengharapkan kerjasama dan sokongan daripada masyarakat (Kamarulet *al.*, 2010). Oleh itu, untuk mewujudkan sekolah sebagai organisasi social maka perlu memiliki ciri-ciri, iaitu: memiliki ahli-ahli yang tetap, mempunyai struktur organisasi sekolah, mempunyai hubungan sosial, membangunkan semangat kebersamaan sekolah, dan mempunyai kebudayaan tersendiri (Uno, 2009). Kecemerlangan sekolah sebagai organisasi pendidikan umumnya dipengaruhi oleh elemen-elemen utama seperti pengetua, guru, pelajar, struktur pengurusan dan pentadbiran sekolah, teknolog pendidikan dan persekitaran sekolah yang sihat (Tilaar, 2000; Aunillah, 2011). Kesemua elemen ini sentiasa mengalami perubahan samaada berkembang secara positif atau pun negatif.

Untuk menjadikan sekolah sebagai tempat pengajaran dan pembelajaran berterusan, maka sekolah harus diwujudkan sebagai organisasi pembelajaran (Senge, 1996; Marquard, 1996; Ayob, 2005). Organisasi pembelajaran adalah sebuah organisasi yang terdiri daripada sekumpulan orang yang mempunyai matlamat dan komitmen yang sama untuk mencapai matlamat tertentu menunjuk kepada perubahan (Garvin, 1993; Senge, 1996; Leithwood, 2005; MohdNajib, 2010). Organisasi pembelajaran dapat diwujudkan apabila ahli-ahli dalam organisasi tersebut sentiasa dapat berkomunikasi secara jujur, saling menghormati, dan sentiasa mempunyai idea baharu serta bebas menampakkan diri sendiri apa adanya (Edmondson, 2002; Rosdiana, 2003). Dalam hal ini, masyarakat Indonesia meletakkan harapan yang tinggi kepada sekolah dalam usaha melahirkan manusia yang berkualiti iaitu berilmu, bermoral dan mempunyai kompetensi. Kualiti sumber manusia telah menjadi salah satu agenda

penting di sekolah-sekolah di Indonesia padamasakini (Yuniarsih&Suwatno, 2008; Matry, 2008; Uno, 2009).

2.0 LATAR BELAKANG

Visi pendidikan Indonesia bermatlamat untuk mewujudkan sumber manusia yang berkualiti dan mampu bersaing diperingkat antar bangsa (Depdiknas, 2009). pendidikan yang berkualiti amat bergantung pada kompetensi guru (Halima Harun, 2006). Oleh itu, pemerintah dan masyarakat Indonesia meletakkan jangkaan yang tinggi kepada guru-guru dalam mencapai visi, misi, dan matlamat pendidikan di Indonesia. Dalam Undang-undang No 20 tahun (2003) menyatakan bahawa visi pendidikan negara adalah membangunkan potensi pelajar untuk memiliki keimanan dan ketakwaan kepada Allah SWT, berwatak mulia, sihat, menjana ilmu, cakap, kreatif, berdikari, menjadi warga negara yang demokratik dan bertanggungjawab. Untuk merealisasikan jangkaan pemerintah dan masyarakat tersebut, maka diperlukan guru-guru yang mempunyai kelayakan kompetensi supaya boleh menjalankan tugas dan tanggungjawabnya bagi mempertingkatkan kualiti pendidikan, (Jalal., 2005; Nurkamto, 2009 dan Zulfikar, (2009).

Berdasarkan kepada keputusan peperiksaan kompetensi guru menunjukkan bahawa tahap kompetensi guru-guru di Indonesia belum memuaskan. Kenyataan ini berdasarkan kepada keputusan peperiksaan kompetensi guru yang dijalankandisemua wilayah di Indonesia yang dilakukan oleh agensi pembangunan sumber manusia Kementerian Pendidikan dan Kebudayaan dan penjaminan kualiti pendidikan (BPSDMPK- PMP, 2012). Berdasarkan keputusan peperiksaan kecekapan guru yang diikuti oleh 604,752 guru disemua wilayah di Indonesia memperoleh skor purata 42.25 peratus. Keputusan ini masih berada di bawah puratayang dijangkakan iaitu 70.00 peratus oleh agensi pembangunan

sumber manusia Kementerian Pendidikan dan Kebudayaan dan penjaminan kualiti pendidikan (BPSDMPK- PMP, 2012).

Selain itu, keputusan peperiksaan kompetensi guru di wilayah Sulawesi Selatan, yang diikuti oleh 46,639 guru telah memperolehi skor purata sebanyak 39.40 peratus. Keputusan ini berada di bawah skor purata yang dijangkakan oleh agensi pembangunan sumber manusia pendidikan dan kebudayaan serta jaminan kualiti pendidikan (BPSDMPK-PMP, 2012). Data tersebut menunjukkan bahawa kompetensi guru di wilayah Sulawesi Selatan masih berada di tahap yang belum memuaskan. Oleh itu, perlu dilakukan penyelidikan sebagai satu usaha atau strategi bagi menghasilkan model yang boleh meningkatkan kompetensi guru.

Guru adalah aspek penting dalam meningkatkan kualiti pendidikan supaya pelajar dapat bersaing di peringkat global (Hasri Jamal, et al, 2007;. Nurahimah & Mohd Yusof, 2010). Oleh itu, guru perlu mempunyai kecekapan yang tinggi dan profesionalisme (Esah Sulaiman, 2004; Guskey, 1994; Hung, Oi, Chee, & Man, 2007; parkay, 2006 dan Provenso, 2002). Kenyataan yang sama juga dikemukakan oleh Achwarin (2009); Marinkovic, Bjekic & Zlatic (2012) dan Ololube (2006) menyatakan bahawa kecekapan profesional yang tinggi guru adalah faktor utama dalam meningkatkan kualiti pendidikan. Menurut Undang-Undang.N0 14,(2005), terdapat empat kompetensi yang mesti dikuasai oleh guru supaya dapat dikatakan sebagai guru profesional iaitu:

1.1 Kompetensi Guru

Kecekapan merupakan gabungan kemahiran, kebolehan, dan pengetahuan yang diperlukan untuk melaksanakan tugas-tugas tertentu (Akademi Pendidikan, 2009). Sementara itu, kecekapan guru mengikut Undang-Undang Guru dan Pensyarah No. 14 tahun 2005 dan peraturan-peraturan Menteri Pelajaran RI nombor 16 pada tahun 2007 adalah kecekapan

pedagogi, kecekapan peribadi, kecekapan profesional, dan kecekapan sosial seperti yang dinyatakan di bawah;

a. **Kompetensi Pedagogi**

Kecekapan pedagogi merupakan keupayaan guru untuk menguruskan pelajar termasuk pemahaman mengenai asas pendidikan, tingkah laku pelajar, potensi pembangunan pelajar, membangunkan kurikulum yang terdiri daripada: Merancang, melaksanakan dan menilai hasil pembelajaran (UU RI No 14, 2005, BSNP, 2006 dan PP Dekri No 74, 2008). Seterusnya, kecekapan pedagogi merupakan aspek yang berkaitan dengan proses pengajaran dan pembelajaran di dalam bilik darjah, memahami perilaku pelajar, strategi pengajaran dan pembelajaran persekolahan, Shulman, 1987).

b. **Professional competence**

Kecekapan profesional merupakan kecakapan yang paling penting dikuasai oleh guru-guru dalam melaksanakan proses pengajaran dan pembelajaran. Guru tidak hanya menguasai pelajaran, tetapi mereka juga mesti menguasai bidang kepakaran termasuk (a) konsep, struktur, kaedah saintifik, (b) bahan yang sesuai dengan kurikulum sekolah, (c) hubungan antara mata pelajaran, (d) permohonan konsep dalam setiap hari, (e) untuk bersaing secara profesional dalam konteks global tanpa meninggalkan budaya negara (UU RI No 14, 2005, BSNP, 2006). Menjadi seorang guru profesional bukanlah perkara yang mudah. Sebelum menjadi seorang guru profesional, guru perlu melalui beberapa tahapan seperti sebagai guru kerjaya, cekap, bijak, kemudian menjadi seorang guru pakar (Darling Hammond dan Bransford, (2005).

c. **Kompetensi Keperibadian**

Kompetensi keperibadian merupakan keupayaan seorang guru untuk berakhlak mulia, mantap, stabil, matang, arif dan bijaksana, menjadi teladan bagi orang lain, menilai pencapaian diri, membangunkan diri dan agama (UU RI No.14, 2005, BSNP, 2006). Pada dasarnya pembelajaran merupakan perubahan tingkah laku. Guru boleh mengubah

tingkah laku pelajar jika guru dapat memberi contoh yang baik bagi pelajar. Di samping itu, guru mesti mempunyai kualiti peribadi seperti tanggungjawab, berwibawa, berdikari dan disiplin dalam menjalankan tugas (Mulyasa, 2009).

d. Kompetensi Sosial

Kompetensi sosial adalah keupayaan guru untuk bekerjasama dengan masyarakat. Keupayaan tersebut merupakan sambung komunikasi sama ada lisan atau tulisan terhadap rakan kerja, orang tua atau wali pelajar, dan berinteraksi dengan masyarakat sekeliling (UU RI. No. 14, 2005, BSNP, 2006 dan PP RI. No. 74, 2008). Kompetensi sosial yang paling penting untuk dikawal oleh guru ialah idealism dan cita-cita. Idealism ini dapat dicapai melalui pendidikan seperti kesungguhan mengajar, berinteraksi dan berkomunikasi secara langsung dengan masyarakat dan memberikan idea-idea melalui penulisan dalam bentuk artikel. (Sukmadinata, 2006).

Salah satu strategi yang perlu dilaksanakan untuk mempertingkatkan kompetensi guru adalah amalan organisasi pembelajaran. Strategi ini mempunyai kesan yang positif terhadap peningkatan kompetensi guru. Menurut Senge (1990) menyatakan bahawa organisasi pembelajaran adalah organisasi yang menyediakan peluang kepada guru agar dapat belajar secara berterusan untuk meningkatkan kompetensi sendiri, daya saing, keberkesanan dan kecemerlangan organisasi. Selanjutnya Senge (1996) berkata bahawa salah faktor yang boleh menyokong guru-guru dalam meningkatkan kompetensi mereka adalah dengan mengamalkan model organisasi pembelajaran “the fifth discipline” iaitu kepakaran peribadi, model mental, perkongsian visi, kumpulan pembelajaran dan sistem berpikir. Kelima-lima disiplin ini merupakan perkara yang utama dalam amalan organisasi pembelajaran. Adapun huraian the fifth discipline seperti berikut ini.

1.2 The Fifth Discipline

a. **Kepakaran Individu**

Kepakaran individu merupakan suatu disiplin untuk selalu membangunkan individu di dalam sesebuah organisasi untuk belajar berterusan memperdalam visi peribadi, memperkuat komitmen, memfokuskan kemampuan, membangun kesedaran, dan melihat kenyataan secara objektif.

b. **Model Mental**

Model mental merupakan gambaran atau kemampuan yang dapat mempengaruhi cara kita bertindak dan berfikir untuk memahami dunia. Jadi model mental merujuk kepada peningkatan kepercayaan, persepsi terhadap pemikiran dan tingkah laku.

c. **Perkongsian Visi**

Perkongsian visi adalah ahli-ahli organisasi berkumpul untuk memberikan idea atau pendapatnya mengenai tujuan yang akan dicapai oleh organisasi pada masa hadapan. Kemudian visi tersebut akan dijadikan panduan dalam melaksanakan pekerjaan sehingga visi tersebut dapat terwujud.

d. ***Kumpulan Belajar***

Pembelajaran berpasukan adalah kemampuan anggota organisasi untuk berfikir secara kolektif, membangunkan kemampuan secara bersama-sama akan lebih baik berbanding dengan apa yang dilakukan secara sendiri-sendiri.

e. **Sistem Berfikir**

Sistem berpikir iaitu kemampuan untuk menjalankan organisasi secara keseluruhan, bukan sebagai komponen yang terpisah-pisah. Sistem berpikir dapat membantu terjadinya perubahan secara efektif dan bertindak lebih baik dengan proses pekerjaan yang sistimatis.

Di Indonesia, amalan organisasi pembelajaran sebenarnya telah dijalankan oleh setiap sekolah, namun istilah organisasi pembelajaran belum terlalu populer dikalangan guru-guru di sekolah kerana model ini masih jarang dibincangkan dalam organisasi sekolah. Bagi merealisasikan organisasi pembelajaran di sekolah, guru perlu mewujudkan

satu budaya pembelajaran yang berterusan dalam kalangan warga sekolah seperti sikap saling bekerjasama, kemampuan untuk berkongsi tanggungjawab antara pengetua sekolah dan guru-guru, dan pembentukan budaya kolaboratif antara guru dengan komuniti sekolah. Menurut Senge (2002) menyatakan bahawa penerapan organisasi pembelajaran di sekolah amat penting untuk melakukan perubahan-perubahan agar dapat mempertingkatkan kualiti guru dan kualiti pendidikan di sekolah.

Pernyataan tersebut diatas disokong oleh kajian yang dijalankan oleh Wang & Lo (2003) bahawa pembelajaran organisasi mempunyai pengaruh yang positif ke atas kompetensi. Begitu juga, dengan Chaston & Badger (2001) yang menyatakan bahawa pembelajaran organisasi merupakan asas daripada kompetensi. Organisasi pembelajaran dapat membina kompetensi guru supaya mereka dapat menggunakan pengetahuan dan kemahirannya untuk mengatasi masalah-masalah yang dapat menghambat peningkatan kompetensi guru. Manakala Senge (1996); Marqued (1996) berkata bahawa ciri-ciri organisasi pembelajaran adalah organisasi yang boleh memberi peluang kepada guru-guru untuk belajar berterusan dalam meningkatkan kompetensi, daya saing, keberkesanan dan kecemerlangan organisasi. Oleh itu, pelaksanaan organisasi pembelajaran di sekolah amat penting untuk membangunkan kompetensi guru dan kualiti pendidikan.

Manakala kajian yang dijalankan oleh Yusof Boon & Fadzlon Hasan (2011) mendapati bahawa sekolah semakin bergantung kepada guru-guru dan kakitangan dalam membuat keputusan. Kebanyakan pengurus atau pemimpin kurang sedar bahawa peranan kepimpinan dan tanggungjawab mereka adalah peneraju terhadap organisasi secara keseluruhan. Oleh itu, dapatan kajian menunjukkan bahawa pihak pentadbir, guru-guru dan kakitangan sokongan memberi kesan yang positif terhadap kejayaan amalan organisasi pembelajaran dalam meningkatkan kualiti pendidikan di sekolah.

Berdasarkan pernyataan diatas, penyelidik membuat kesimpulan bahawa pelaksanaan amalan organisasi pembelajaran boleh menyokong sekolah ke arah kejayaan dan kecemerlangan. Amalan organisasi pembelajaran yang diimplementasikan melalui *the fifth discipline* dapat memberi manfaat yang tinggi bagi guru terutama kepada penerapan konstruk kepakaran peribadi dan kumpulan belajar. Kepakaran peribadi merupakan usaha yang dilakukan oleh guru dalam belajar berterusan bagi mempertingkatkan kompetensi. Manakala konstruk kumpulan belajar merupakan suatu strategi bagi guru untuk bekerjasama dengan guru-guru lain, berbagi idea, dan pendapat dalam mengatasi masalah-masalah yang mereka temukan dalam peroses pengajaran dan pembelajaran. Kedua konstruk ini berkaitan langsung dengan organisasi pembelajaran guru dalam mempertingkatkan kompetensi sendiri. Secara amnya kesemua konstruk *the fifth discipline* dapat memberi pengaruh terhadap peningkatan kompetensi guru dan kualiti pendidikan di sekolah. Oleh itu, penyelidik melakukan kajian mengenai penerapan amalan organisasi pembelajaran dalam mempertingkatkan kompetensi guru di sekolah.

3.0 METODOLOGI KAJIAN

3.1 Concurrent Embedded Design

Kaedah yang digunakan dalam kajian ini adalah kaedah gabungan kuantitatif dan kualitatif (*concurrent embedded Design*). Kaedah ini menggunakan dua jenis data iaitu data kuantitatif dan data kualitatif. Kedua-dua data dikumpulkan secara bersamaan oleh penyelidik. Seterusnya, kaedah kuantitatif dijalankan dengan menggunakan soal selidik. Manakala kaedah kualitatif dijalankan dengan menggunakan temubual. Kedua-dua kaedah ini dijalankan bagi memperoleh data yang komprehensif, dipercayai dan objektif (Cristensen,

2007 dan Creswell, 2008 dan Haase 2010). Pada peringkat pertama, kajian kuantitatif dijalankan dengan menggunakan soal selidik. Melalui soal selidik data tentang organisasi pembelajaran dan kompetensi guru boleh diperolehi secara bersamaan. Seterusnya, penyelidik melakukan temubual kepada pengetua sekolah untuk memperoleh data kualitatif mengenai peranan pengetua dalam mengamalkan organisasi pembelajaran di sekolahnya.

3.2 Populasidan Sample Kajian

a. PopulasiKajian

Populasi kajian melibatkan semua guru pada Sekolah Menengah Pertama di Distrik Sidenreng Rappang Sulawesi Selatan. Menurut sumber data Pejabat Kementerian Pendidikan Nasional Distrik Sidenreng Rappang (2012) bahawa Bilangan populasi guru di Distrik Sidenreng Rappang adalah 1,109 guru. Jumlah ini menunjukkan bahawa bilangan populasi cukup besar, oleh itu, Mohd Majid (2000) dan Sugiono (2011) menyarankan agar menggunakan sebahagian sahaja daripada populasi bagi mengurangkan masalah dalam menggunakan pendekatan persampelan.

b. Sample Kajian

Teknik penentuan sampel dalam kajian ini berdasarkan teknik penentuan sampel yang disarankan oleh Mohd Najib (2009) iaitu jumlah populasi 1,109 dikalikan dengan 30 peratus iaitu seramai 333 orang guru ditambah 20%, jadi jumlah sample semuanya adalah 500 guru. Semua sampel yang berjumlah 500 guru diminta memberi maklum balas melalui soal selidik tentang peranan pengetua dan amalan organisasi pembelajaran serta kompetensi guru. Maklum balas guru melalui soal selidik digunakan untuk menilai kesan tentang peranan pengetua dan amalan organisasi pembelajaran terhadap peningkatan kompetensi guru di Sekolah Menengah Pertama Distrik Sidenreng Rappang Sulawesi selatan. Manakala, teknik penentuan sampel kualitatif kajian

ini iaitu semua pengetua yang berjumlah 10 orang turut dipilih untuk ditemubual melalui kaedah persampelan bertujuan. Jumlah ini sudah memenuhi syarat untuk mencapai titik tepu (Gredler, 1996) dipetik daripada (Pope et al., 2000).

4.0 DAPATAN KAJIAN

Berdasarkan dapatan analisis statistik yang dijalankan dengan menggunakan perisian SPSS 18.0 menunjukkan bahawa pembolehubah bebas (X) organisasi pembelajaran dan pembolehubah bersandar (Y) kompetensi guru memiliki hubungan yang positif. Dapatan menunjukkan bahawa terdapat hubungan yang signifikan ($r = .341$, $p < .05$) antara organisasi pembelajaran dan kompetensi guru disekolah. Hal ini menunjukkan bahawa hipotesis null (H_0) dalam kajian ini ditolak. Perkara ini menunjukkan bahawa kedua pembolehubah Organisasi Pembelajaran (X) dan pembolehubah bersandar (Y) kompetensi guru memiliki hubungan positif terhadap peningkatan kompetensi guru. Ini bermakna bahawa elemen-elemen organisasi pembelajaran dalam hal ini *the fifth discipline* telah dijalankan oleh guru di sekolah dengan baik. walaupun, penerapan organisasi pembelajaran ini masih perlu dimaksimalkan pelaksanaannya bagi mempertingkatkan kompetensi guru di sekolah.

Dapatan kuantitatif turut disokong oleh dapatan kajian kualitatif melalui temubual yang dijalankan keatas 10 pengetua sekolah menengah pertama di district Sidenreng Rappang Sulawesi Selatan. Dapatan kajian menunjukkan bahawa 8 (80%) pengetua menyatakan bahawa guru mempertingkatkan kompetensinya melalui belajar sendiri dan 3 (30%) pengetua menyatakan bahawa guru mempertingkatkan kompetensinya dengan cara melakukan perbincangan dalam kumpulan belajar dengan guru lain. Seterusnya, 3(30%) pengetua menyatakan bahawa guru mempertingkatkan kompetensi peribadi dengan melakukan

refleksi diri setiap melakukan pengajaran dan pembelajaran dibilik darjah serta 2 (20%) orang pengetua menyatakan bahawa guru mempertingkatkan kompetensi peribadi dengan cara melanjutkan pendidikan keperingkat yang lebih tinggi. Manakala 2(2%) pengetua menyatakan guru mempertingkatkan kompetensi peribadi dengan cara belajar sambil bekerja, dan 1(10%) pengetua menyatakan guru sentiasa mengikuti pelatihan pengajaran dan pembelajaran bagi mempertingkatkan kepakaran peribadi.

6.0 KESIMPULAN

Berdasarkan dapatan analisis statistik dalam kajian menunjukkan bahawa amalan organisasi pembelajaran di Sekolah Menengah Pertama di district Sidenreng Rappang Sulawesi selatan telah dilaksanakan dengan baik. Ciri-ciri organisasi pembelajaran yang dilaksanakan adalah *the fifth discipline* yang terdiri daripada lima element utama iaitu kepakaran peribadi, model mental, perkongsian visi, kumpulan belajar dan sistem berpikir. Kesemua elemen ini memang sudah sepatutnya dijalankan oleh guru dalam menjalankan aktiviti pengajaran dan pembelajaran di sekolah. walaupun istilah organisasi pembelajaran ini belum terlalu familiar dengan guru di sekolah menengah pertama di distrik Sidenreng Rappang Sulawesi selatan. Secara umum dapatan kajian menunjukkan bahawa pelaksanaan amalan organisasi pembelajaran telah dijalankan dengan baik dan memiliki hubungan yang signifikan dalam mempertingkatkan kompetensi guru. Model ini sangat cocok dijalankan oleh guru kerana dapat mempertingkatkan kompetensinya tanpa harus meninggalkan tugasannya sebagai pendidik di sekolah. Oleh itu, penyelidik mencadangkan kepada guru-guru lain untuk mengamalkan organisasi pembelajaran melalui *the fifth discipline* dalam melaksanakan aktiviti pengajaran dan pembelajaran di sekolah bagi mempertingkatkan kompetensi

guru dan kualiti pendidikan.

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IMPORTANCE OF GREEN GENERIC SKILLS IN GREEN TECHNOLOGY INDUSTRY

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ABSTRACT

A skilled workforce is necessary if we are fully to realize the opportunities a green technology offers and to support the green growth. Clearly this means a focus on skill in environmental and low carbon industries, but that alone is not sufficient. Education and training for sustainable development means that we try to see the globe as a whole and understand our joint responsibility for its wellbeing, including the human life and physical environment. Education for sustainable development aims to raise citizens to adopt certain knowledge, skills, attitudes, and values in domain areas of TVET (Johanna. L, 2010). A traditional manufacturing business for instance must also be planning the processes and the skills it needs for operating in a more resource-efficient way, minimizing carbon emissions and preparing for climate changes. In fact, any business today, from a small owner managed company to a large service business should be thinking about the green generic skills required to use resources efficiently and sustainability. A global perspective can be given by green generic skills ethics to TVET. The first two chapters shows the national policy of green technology together with discussion about green generic skills. Then focus on the demands from the industries and followed by career in green technology industries. Finally, window to the future of the importance of green generic skills is opened by awareness of national practice.

Key words: *Green generic skills, Technical Vocational Education and Training (TVET), Green technology industries..*

1.1 INTRODUCTION

In this fast changing and demanding times, changes in education sector are inevitable. Transforming education to meet 21st century challenges is now one of the key focuses of all major efforts to combat environmental deterioration, social problems and economic crisis. There is widespread realization that it is through embedding sustainability in education that our society can find lasting solutions to climate change and global warming, loss of biodiversity and extinctions, human rights and poverty, energy and food security and many other colossal challenges.

Meeting the green and sustainability challenge requires human capital that is able to adapt and respond to the evolving needs of our society, the environmental threats and the fast changing economic landscape. Recognizing these emerging needs, more and more educational institutions around the world are striving in their operations and in their educational programs. The number of those institutions ready to incorporate sustainability in their curriculum, courses and teaching materials is growing fast. And the calls from policy makers, experts, leading educationist and society at large to mainstream sustainability in education system are on rise.

The issue of employability of graduates has become very serious and critical in many countries including Malaysia. The biggest challenge facing institutions of higher learning is to develop green employable skills, enhance knowledge regarding sustainability, and make local graduates more attractive to employers. Both local and global workplaces are demanding workers that are able to transform knowledge and skills learnt into successful workplace performance. Evidence

from surveys suggested that employers are more concerned about soft skills or attitudes rather than technical knowledge or competencies since it can be build up. Empirical studies on work found soft skills such as leadership, communication, team building and entrepreneurial interest have become critical for hiring and promoting employees to key positions (Audibert and Jones, 2002). A study done by Evers, Rush and Berdow (1998) indicated that the competencies students need to develop in order to enhance their employability are self-management, communications, managing people and tasks, and mobilizing innovation and change.

The Australian Government defines green skills as the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community (Council of Australian Government, 2009).

2.1 NATIONAL GREEN TECHNOLOGY POLICY (NGTP)

However, in addition to facing serious environmental issues, the world is also confronted with unprecedented social, political, economies, financial and fiscal challenges. Making the needed transformation happen requires study among stakeholders, sharing of experiences, building synergies and working together to overcome the barriers to change and to create a sustainable future.

In achieving such crucial goals; it is important to foresee any possible problems that will lead to failure in executing the transformation plan. Apart from that, challenges that possibly will occur especially at the ground stage that rarely been carried forward to the top notch management, could be determine and tapped down before it become parasites to the plan.

The National Green Technology Policy was

successfully launched by the Prime Minister YAB Dato' Sri Mohd Najib Tun Abdul Razak on 24 July 2009. The National Green Technology Policy is built on four pillars which are ; Energy, Environment, Economy and Social. It may be shown as figure above.

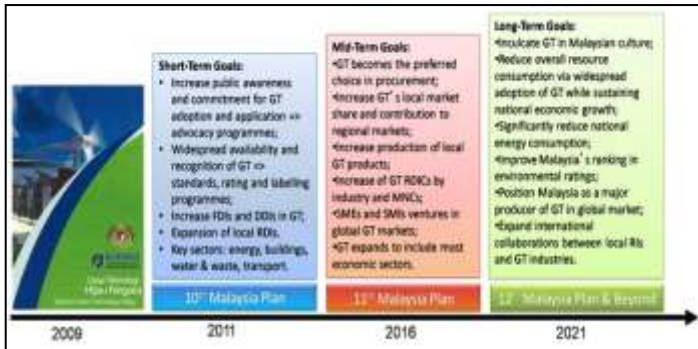


Figure 1 : National Green Technology Policy Pillars

The Ministry of Energy, Green Technology and Water Malaysia (KeTTHA) was responsible for the planning and formulation of policies for energy, green technology and water sectors as well as to facilitate and to regulate the growth of these sectors. The nationwide goal of the policy is to provide direction and motivation for Malaysians to continuously enjoy good quality living and a healthy environment. To realize this goal, the Prime Minister has specified perspective alignments towards the goals of the National Green Technology Policy as above:



Figure 2 : National Green Technology Policy Goals

Review on those goals that has been setting up, it is clear that education and green technology always moving together in order to shaping the country's economic growth. Therefore, education system must be equip with the clear and systematic tentative in line to provide intellectual and skillful human capital growth..

3.1 THE DEMANDS FOR SKILLS IN GREEN TECHNOLOGY INDUSTRY

Generic skills are also known by many other terms such as soft skills, key skills, common skills, essential skills, employability skills, basic skills, necessary skills, competencies skills, and transferable skills. Nabi and Bagley (1998), have divided the generic skills into three categories which are personal skills, communication skills, and problem solving skills. Bennett, Dunne and Carre (2000) have reported based on their research findings that generic skills can be presented in four broad areas of management skills namely management of self, management of others, management of task, and management of information. Crosbie (2005) had listed the eight soft skills that are needed by all individuals:

collaboration/teamwork, communication skills, initiative, leadership ability, people development/coaching, personal effectiveness/personal mastery, planning and organizing, and presentation skills.

From the reviews literature in other countries, the Malaysian Ministry of Higher Education has developed the soft skills module that was introduced to the public universities in 2007. The former higher education minister, Datuk Mustapa Mohamed has said that the module was introduced after taking into consideration complaints from employers that local graduates lacked soft skills.

“We take these views seriously, which is why we are introducing this new module for the new 2006/07 intake... My mission is to ensure our graduates have the necessary skills.”

The module highlighted seven elements of generic skills that need to be incorporated into the curriculum namely communication skill; critical thinking and problem solving; teamwork; lifelong learning and information management; ethics and professional moral; entrepreneurship; and leadership skill.

However, green generic skills can be simplified by Andy G. (1999) as a skill that can support environmental and social responsibility. The new green technology era is going to have plenty of room for innovative thinkers and entrepreneurial types who have what it takes to strike out on their own as consultants or business owners.

CAREER IN GREEN TECHNOLOGY INDUSTRY

As the matter of aspiration to achieve the 2020 Vision, Green employment is growing, and fast which is clearly they need a worker who has green generic skills. Being environmentally thinker or in other words for being green it doesn't mean having to confine a niche. Alex Steffen

on worldchanging.com, September 12, 2007 has said,

“The world has never more needed a generation of heroes. . . . We need thousands of people, millions of people, swarming out of their lifestyles and leading world-changing lives . . . inventing new answers, changing their companies (or quitting their jobs and starting better companies) . . . redesigning their cities . . . and in every other way making it happen.”

For every specialty, college major, level of expertise, and specialized interest, there seems to be a green job available, and if there isn't yet, there must soon will be. The jobs are and will be in fields as diverse as the world of work itself.

In most respects, finding a green job is no different from finding any sort of job. Based on www.careerbuilder.com, in 2007 the top twenty-five green jobs included hydrologist, environmental engineer, science teacher, fundraising director, economist, environmental attorney, landscape architect, wildlife biologist, and pollution control engineer. Eco-conscious jobs will be woven into the fabric of every corporate structure, and in the future that fabric will be green..

5.1 CONCLUSION

In conclusion, the importance of green generic skills in the green technology industry is on a high demand and should be being an advantages to the graduates. It is very useful in ensuring that the education realized in line with the national policy goals of green technology. Increase education and public awareness and encourage the use of green technology extensive green technology is an ongoing effort to expand again potential of individuals in a holistic and integrated towards a balanced and harmony are intellectually, spiritually, emotionally and physically by the trust and

devotion to God. This effort is in order to produce Malaysian citizens who are knowledgeable, competent, honorable, responsible and capable achieve personal well-being and contribute to the harmony and prosperity of society and the state. Able to stimulate and implement the development of green technologies knowledge, skills, and self-esteem and individual economies, thus creating a state developed in the future.

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A META-ANALYSIS OF RESEARCH OF PROBLEM SOLVING ACTIVITIES IN ONLINE DISCUSSION

Noor Hidayah Che Lah & Zaidatun Tasir

ABSTRACT

The development of computer and technology nowadays gives more influence especially to education sector. Instructors and students applied the usage of computer and technology in their online learning. During teaching and learning sections, psychological processes such as problem solving will occur. Problem solving not only occurs during teaching and learning in the classroom, but same goes to the online learning. Therefore, this paper discussed more on the learning activities of problem solving which are applied through online discussion. Finding of analysis on selected papers, brief explanations of each study, limitations and some future suggestion also were discussed on this paper.

Keywords: Problem Solving, Learning Activities, Online Discussion

INTRODUCTION

Today, technology has changed the teaching and learning method. Most of instructor and students are using computer and online medium to implement teaching and learning method even though they are not in the classroom. By using

online medium, teaching and learning also can be occurred at anywhere and at anytime. Within the learning process, psychological processes can be occurred and same goes to online learning. Psychological processes could perform any types of activities that use a variety of processes such as thinking, remembering, problem solving, interpretation and others. One of the psychological processes in online learning is problem solving. Problem solving refers to the mental process that involves discovering, analyzing and solving problems (Cherry, 2003). Nowadays, by using variety of online medium, problem solving can be applied within teaching and learning through online discussion. This paper discusses about a meta-analysis of research of problem solving activities in online discussion.

There are a lot of online learning medium that are used within discussion among students through online learning. For example, Facebook, e-learning, web based online, blog and online forum are the online medium used for online discussion.

FINDING OF ANALYSIS ON SELECTED PAPERS

The purpose of this study is to identify types of learning activities through online discussion regarding to the problem solving. The following keywords were used in searching for related publications; problem solving in online discussion, problem solving in online learning, activities in online learning, and problem solving in online forum. We used IEEExplore, Digital Library, Science Direct, and Pro-Quest in searching for those publications. The search has produced 45 hits, but only 9 were selected and relevant to this study. These selected publication were chosen according to these criteria: 1) the study focuses on problem solving activities; 2) the study must be published between 2005 until present; 3) the study focuses on higher education, 4) the study must use

online medium. Table 1 shows the list of the studies related to the topic discussed. We start with reviewing the brief explanation of the each study selected, followed by limitations and some future suggestions for improvement for the next research.

Table 1List of studies on research of the problem solving activities in online discussion

Author (s)	Participant (s)	Type of Activity (s)	Learning Activities	Medium
Suh, S.(2005)	61 students were enrolled in an introductory course in Educational technology (EME2040) in the College of Education at a large university in the southeastern U.S.	Project scenario (3 weeks)	Students received a project scenario and they posted their reflection of problemsolving strategies on the online discussion board after engaging in creating solutions with PowerPoint, Word, Excel, and Inspiration software applications. All students had to access the blackboard course website to discuss a given topic.	online discussion board
Toy, S. (2007)	64 teachers' education students	Problem Scenario (2 hours)	The instructor gave the students a problem scenario regarding of multimedia project Then,	Problem Solving Learning Portal (PSLP)

			students will discuss among them to find the solution through portal.	
Oldenburg, N.L (2008)	30 RN-BS student is a registered nurse who is completing requirements toward a baccalaureate degree in nursing.	Case Study	The instructor gave students 7 case studies regarding the patient diseases in several situation. Then, students were asked to find the solution how to cues every cases through blackboard, students are able to post comments to discussion forums as well as to attach documents for review by other group members.	Blackboard™ a course management system
Hou, H.T (2010)	32 university students who are majoring in Information Management at a university in northern Taiwan.	case scenario (7days) problem-solving tasks assigned by the teacher (7days)	<i>Case Scenarios</i> : the instructor designed and assigned a certain case in organizational management. The students analyzed the problems faced by the firm, and then they proposed solutions and suggestions. This activity required students to solve issues of organizational management in a MP3 Player	Online forum

			<p>company</p> <p><i>Problem-solving tasks assigned by the teacher:</i> the students were required to solve issues of organizational management bottlenecks faced by a real estate brokerage company. Before the commencement of the task, the descriptions of the case scenarios and the problem-solving tasks were stated in the forum.</p>	
Hou, H.T. & Wu, S.Y. (2010)	40 students enrolled in the same elective course, Web Design, at a university in northern Taiwan.	case study (98days)	The participants were put into five groups of seven to ten students. After the tasks were announced, the students from each group were asked to conduct collaborative discussions on the tasks and exchange ideas until they reached a conclusion.	instant messaging (IM) tool

Chan g, Y.S (2012)	107 fourth- grade student s selecte d from Taipei City (urban area), Taipei County and Hualie n City (suburb an areas), and Hualie n County (rural area) in Taiwan .	proble m- solvin g tasks assign ed by the instru ctor	Students were given learning activity by the instructor that requires them to produce their own electronics car models. Students were asked by instructor to use CPS to create their own model and discuss together among them.	online (web- based) creative problem- solving (CPS)
Xia,C .J,Fiel der,J., &Sira gusa, L. (2013)	30 students participated in the discussion forums who enrolled in the Geographic Data Analysis (GDA).	case study	Students enrolled offshore, , in different states, or in rural areas of Western Australia were unable to attend on- campus lectures and tutorials so, instead, had access to online lectures recorded by screen capturetools and simulated fieldwork, and online tutorials.	Online Discussion forum
Ioann	34	Case	Students	Media

<p>ou,A., Brown. S.W., &Arti no. A.R (2014)</p>	<p>graduat e student s in two section s of an online course on learnin g theorie s at a public univers ity in Northeast USA.</p>	<p>proble ms: Case A (week s 10– 11) Case B (weeks 12– 13)</p>	<p>were randomly assigned to groups of 3–4 students to work on Case A. During weeks 12– 13, the same groups worked on Case B, Using mediawiki and discussion board. In order to guide their activity, students were providedwith guidelines on how to approach the analysis of the case problem.</p>	<p>Wiki discuss ion board within Blackb oard WebC T</p>
<p>Lin, P.C., Hou, H.T, Wu,Y .S., & Chan g, K.E (2014)</p>	<p>45 student s from the Colleg e of Manag ement at a univers ity in norther n Taiwan</p>	<p>Collab orativ e Proble m Solvin g (2hour s) simula tion- based instru ctional appro ach (16 weeks)</p>	<p>Before the students engaged in the given network troubleshoo ting tasks, the instructor explained the network troubleshoo ting problemsand the goals of the tasks to the students.All of the groups were given the same network troubleshoo ting task</p>	<p>Facebo ok</p>

			<p>(i.e., solving a network connection problem in a company) on Packet Tracer. At the beginning of the task, each student could operate and test the network - environment on a computer. The instructor provided each group with an online learning sheet. This sheet explained that students could have problem-based discussions within their group's private Facebook group (each group used one private Facebook group).</p>	
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According to table 1, learning activities that have been used are project scenario, problem scenario, case study, case problem, case scenario, problem solving task assigned by teacher or instructor, collaborative problem solving and simulation-based instructional approach. The dominant learning activities that have been used by researcher are

scenario and case study. From 9 publications, 3 researchers used scenario and 3 researchers used case study.

BRIEF EXPLANATION OF EACH STUDY

Generally table 1 discovers all of the learning activities that has been used in online learning discussion. Three researchers applied scenario in their study are Suh (2005), Toy (2007) and Hou (2010). Suh (2005) investigated on how to enhance complex problem solving in web based instruction by using online discussion board. This study used collaborative groups guided questions in a hybrid web-enhanced learning environment in which students attended class face-to-face and online. The result of ANOVA indicated that there was a significant interaction of collaborative groups on students' performance. The students who worked in collaborative groups without the guided questions (GC) performed better than those who worked individually without the guided questions (IC). There were limitations on observation of group interaction. Students were asked to discuss in online discussion but some of them met face to face after class section to discuss. Therefore, there is a limitation to capture all of the students interaction outside of classroom. However, this study do not cover the training for students preparation on how to moderate group discussion and problem solving since some students are not familiar with the collaboration. Another study done by Toy (2007) using Problem Solving Learning Portal (PSLP) aims two objectives; i) to characterize students' ill-structured problem solving strategies in a Web-based problem-solving environment and ii) to examine the effect of these problem-solving strategies on students' problem-solving performance. The finding was the use of cluster analytic techniques and examination of clickstream data made it possible to identify and characterize different

problem-solving strategies individuals used while completing the online ill-structured problem-solving task. However, these differences did not reach significance probably due to the small sample size. By using the larger samples may help better demonstrate the relationships between these variables and ill-structured problem-solving performance. This study does not investigate intrapersonal and external variables that might help better explain what kind of individuals may be more effective problem solvers.

Hou (2010) explored the learning process of adopting collaborative online instructional discussion activities for the purpose of problem-solving using situated scenarios in a higher education course by using online forum as an online medium. According to him, the task required students to propose solutions to organizational restructuring for the existing bottlenecks, they could see that the majority of students merely skimmed the surface of the company's status (e.g. poor sales) when they put forward their views during discussion. Finding showed that they lacked depth in problem-solving and in analysis and discussion. However, in terms of solving the problems presented in the assigned task, the students' analysis lacked depth. Moreover, the students lacked an organized process for reaching a solution. There were many superficial messages that lacked depth and specificity. The role of teacher is important, but this study does not cover for that. For example teacher should introduce role-playing into discussion-based learning activities using situated scenarios. Besides that, teacher may observe students' daily online discussion.

Case study were done by 3 researchers. They are Oldenburg (2008), Hou and Wu (2010), and Xia, Felder and Siragusa (2013). Oldenburg (2008) done a study based on the frameworks of problem based learning and the community of inquiry model used Blackboard™ a course management system. The purpose of this study was to

explore the problem-solving experiences of a group of six nursing students in an online problem based learning course. The finding from this study indicates that, even though at the initial phase, there were misgivings about the effectiveness of group problem solving, students successfully worked through the six cases and reported positive feelings about group process. They were engaged and active, posting nearly 700 comments on the discussion board during the semester. However, there is the possibility that students did not share their honest perceptions. This course involved one group of RN-BS students at Northern Illinois University so that the result will be bias to students in other settings. This study do not cover utilizing alternative theoretical frameworks as the basis for coding would serve to expand the knowledge base of problem-solving strategies. Besides that, It is important to anticipate and provide guidance for problems such as these, particularly when working with learners who have limited online experience. This guidance should include discussion of online search strategies and evaluating the credibility of resources.

A study done Hou and Wu (2010) revealed behavioral patterns and they have provide specific suggestions for teachers regarding how to implement synchronous discussions that are targeted to students' knowledge construction processes by using instant messaging (IM) tool. They found that real-time coordination is beneficial to discussion tasks, and coordination involves joint decision making rather than independent or arbitrary assignments. The high-quality discussions have more coordination related discussions, especially on the methods of task coordination. The limitation of this study was their focus on general collaboration discussion tasks, which could lead to limited diversity in knowledge construction. Besides that, students also had more off-topic during the discussions. Due to the unstable internet connection, it also gives problems to students to discuss in online discussion.

However, this research does not cover the teacher roles as the observer. The teacher will observe students' knowledge construction in an initial discussion task to determine the discussion quality of each group and introduce guidance to low-quality teams. For example when one group have problem, the teacher will give a hint for them to get the solution. The teacher could also facilitate the discussion process and develop students' argumentative abilities (Driver, Newton, & Osborne, 2000; Erduran, Simon, & Osborne, 2004).

Xia, John & Siragusa (2013) used an online discussion platform to investigate the relationship between the frequency of students' postings on the blackboard forum and their final marks, relationship between the role students played in the discussion forum and their final marks and also the relationship between response time lag and student engagement on the discussion board.

The results revealed that it increased student participation levels were achieved in this process of problem solving. There is a reasonably strong level of statistical association between the roles students played in the discussion board and their final marks. Besides that, the time lag between the students making postings (particularly around the time when assessment items were due) and the lecturers' responses was found to be beneficial to the students' active learning, as it allowed them time to help each other with the assessment items. The limitation in this study several students who did not participate in the online discussions, but who still attained high final results. However, this study does not cover why some students are not participating in the discussion. Besides that, researcher should create an instrument to measure students' roles in the discussion forum and their learning styles, and a better measure to assess students' qualitative and quantitative.

Then, problem solving task assigned by instructor was used by Chang (2012) and Hou (2010). Chang

(2012) investigated the effects of online (web-based) creative problem-solving (CPS) activities on student technological creativity. The purpose of his study is to examine the characteristics of student creativity in the context of online CPS. This study reported that according to the preliminary analysis, students' networking concepts and network troubleshooting abilities improved after the activity. The limitation in this study is many students plagiarise other idea. They duplicate other students' idea. However, this study does not cover the characteristics of student technological creativity and a synchronous multimedia interaction system when designing online CPS activities and web pages. Hou(2010) found from the discussion, students raised a variety of different viewpoints and through comparisons and analysis came up with some organizational management ideas for the organization. The students were able to understand and analyze the issue from different perspectives, make connections, and propose solutions. The limitation in this study is the students lacked an organized process for reaching a solution. There were many superficial messages that lacked depth and specificity. However, the sequential patterns of the student's overall behavior and the social interaction still do not be analyzed and explored. By integrate a variety of analytical methods to enable more in-depth exploration of the instructional online discussion strategies with respect to their features and limitations.

The other study done by Ioannou, A., Brown. S.W., and Artino. A.R (2014) applied problem case and choose wiki and discussion board within Blackboard WebCT as an online medium to describe an experimental study that evaluated differences in students' discourse and actions while they discussed in online. They reports that statistically significant differences in the use of a wiki with discussion versus a forum with attached MS Word documents for virtual collaboration on case problems with a group essay

being the final deliverable according to the applying case problem. The limitation in this study is the present investigation lacks a theoretical framework to explain and predict how tools (wikis and forums) might affect the collaborative processes by eliciting and supporting various types of interactions. However, this study does not focus on presenting a theoretical account of how wikis and forums affect the collaborative process.

Last but not least, Lin, Hou, Wu, and Chang (2014) aims to analyze learners' cognitive processing patterns in a collaborative problem-solving (CPS) teaching activity that integrates Facebook discussion tools and simulation-based teaching software by using Facebook as a medium. They revealed that members of the manipulation-centered groups spent more time conducting tests in simulated environments and that their discussions aimed to provide other group members with applicable results (C3, apply) (C3 is 14.12%, which is higher than the 3.77% exhibited by the discussion-centered group). The limitation in this study are only a pre-test and post-test to evaluate the effectiveness of student learning and analysis represents only an initial understanding of student learning effectiveness. However, this study does not cover considering enhancing the performance assessment by using the simulation software before and after the activity and establishing appropriate scoring standards. Other than that, the use of a sufficient amount of discussion time and more in-depth cognitive levels need to cover for some students have pressure for having discussion.

LIMITATION

There are some shortcomings or limitations in implementing problem solving activities through online discussion. This is due to several reasons. First limitation is about students

contributions in the online discussion. Some students might not be involved in the online discussion. According to the research done by Xia, John & Siragusa (2013), some students did not contribute in the online discussion forum. Other than that, a study done Hou and Wu (2010) stated that during the discussion process of joint knowledge construction, discussion may be broken off due to technical issues with internet connection. They also stated that more than half of the discussions were off-topic. Next, according to Chang (2012) stated that, Many students constructed ideas by refining and adjusting others' thoughts. They do not give their own idea but just duplicate others idea. Last but not least, according to the study done by Ioannou, A., Brown. S.W., & Artino. A.R (2014), the present investigation lacks a theoretical framework to explain and predict how tools (wikis and forums) might affect the collaborative processes by eliciting and supporting various types of interactions.

FUTURE SUGGESTIONS

In order to improve the impact of problem solving activities in online discussion, several recommendations should be considered. Firstly the instructor or teacher should design creative activities that can attract more students' attention to contribute in the problem solving activities in online discussion. Xia, Fielder and Siragusa (2013) also suggest that designing and implementing more effective activities to increase student participation in discussion forums. This also support by the Chang (2012) who mentioned that a synchronous multimedia interaction system should be developed and applied in online collaborative problem solving activities.

Besides that, the roles of instructor and teacher are also important in implementing problem solving activities

online discussion. The instructor should play a role in the online discussion. They should not only just give tasks to the students, but also contribute in the discussion to guide students in their discussion. Hou(2010) suggest that teachers are advised to introduce role-playing into discussion-based learning activities using situated scenarios. He also mentioned that if teachers can intervene at the early stages of activities and provide guidance to prevent certain groups of student from the habit of low-participation. Study done by Lin, Hou, Wu, and Chang (2014), suggest that teachers should provide more feedback and guidance for discussion-centered groups to facilitate a more in-depth analysis of the manipulation results. Next, Hou and Wu (2010) suggested that teachers are thus advised that when conducting synchronous discussions, they should consider ways to promote participation, reduce off-topic discussions, and introduce appropriate incentives (such as extra credit or praise) to encourage students to stay on-topic.

CONCLUSION

Problem solving activities not only applied in the face to face learning, but also in online learning which is applied in online discussion. The development of technology approach nowadays most helpful to teacher and students in order to apply their problem solving activities in online discussion. Thus, students and teacher should alert and always construct their knowledge and skill in using new technology platform to make the teaching and learning successful and enhancing their performance in any subject learning whether at school or any institution.

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PROMOTING HIGHER ORDER THINKING SKILLS THROUGHOUTSIDE CLASSROOM STRATEGY IN LEARNING MATHEMATICS

Nor Delyliana Admon, MohdSalleh Abu, Noor Azean Atan,
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ABSTRACT

This paper discusses about alternative way to foster higher order thinking skills among Malaysian students in learning Mathematics. Achievement in Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) in recent years bring the Ministry of Education Malaysia figure out what are the solutions to enhance this skills in students. This study focuses on the issues that contributed to the assessment and the finding said that Malaysian students cannot solve problems which related to the real life situations. Learning outside the classroom is one of the media that provides learning through experience. This suggests that outside classroom learning may give the best opportunity for students to involve with the 'hands on' activities in their Mathematics learning process

INTRODUCTION

Mathematics is based on observations of assorted patterns with logically thinking that leads to various theories of abstract relations (Vale, 2012). The thinking process involves

the skills of mathematical reasoning and creative thinking (Brodie, 2010). In Malaysia, mathematics education was introduced formally to each student since at early age. Mathematics has train them to think logically and systematically in solving problems and decision makings which can make them better in higher order thinking skills (HOTS).

However, the process of learning and teaching in Malaysia secondary schools are still conventional (Bakar & Hadi, 2011; Hamdi *et al.*, 2012). Teachers are prefer to choose traditional methods in order to manage the students easily (Rozita Radhiah & Abdul Rasid, 2012). If these situation are still adopted in Malaysia schools, the HOTS will not expanding as our wish as in the Malaysia Education Blueprint 2013-2025 (Malaysia Education Blueprint, 2013).

In addition, most of the students think that mathematics is abstract (Pound, 2008). Therefore, according to research by Gainsburg (2008), they are an urgency of connecting mathematics in schools with real life situations. Outside classroom learning is a real learning where the students can involve and discover with their direct experience (Moffett, 2011). One of real life situations learning strategy is learning at outside classroom setting, which focusing on the use of learning techniques of 'hands-on' and actively participating in the activity to gain knowledge (Waite, 2010). Students must put into practice 'in the real world' what they have theorized about. Beside that the learning can become inherently student-centered when moved from the boundaries of the classroom into the world at large.

Therefore in this study, the researcher plan to integrate the strategy of learning outside the classroom in Mathematics learning to give students the chances to relate their theoretical into practical in real life situation.

LEARNING MATHEMATICS IN MALAYSIA

Scenario of learning mathematics in Malaysia involves with students who get misconception or confusing of certain concept that have been learnt (Tarmizi, Tarmizi, & Mokhtar, 2010). It is because they think mathematics is abstract (Pound, 2008). Students who have difficulties in problem solving, normally do not master in basic arithmetic skills (Bryant *et. al.*, 2008).

The educational system in Malaysia is very exam-oriented, so that the mathematics teacher tend to 'teach to test' rather than 'teach to learn' (Saleh *et.al.*, 2010). This is why teachers struggling to complete the syllabus before examination.

Furthermore, students in Malaysia are provoked with practice and drill technical questions. They also have mathematical word problem in solving the tasks given (Yein & Mousley, 2005). These situations make students tend to learn by memorizing to fulfill the school and parent's hope and less appreciation of learning in daily life (Harun & Salamuddin, 2010).

Besides that, issues on Malaysia achievement in Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA) recently also shown that our students cannot master in higher order thinking skills. It caused by the format of PISA's questions is about applying the mathematical concept in real life situations. There are 40% involves with 'applying' and 25% is about 'reasoning' in TIMSS's question.

It is clear that these major elements in both assessments reflect the pattern of Malaysia students' thinking. Learning Mathematics is not just memorizing and do the exercises, but it needs to relate and apply the concepts into real life situations. Therefore, through outside classroom learning strategy, it provides student with real experience and

helps them to appreciate the importance of mathematics in their everyday life (Moffett, 2011).

HIGHER ORDER THINKING SKILLS AND CREATIVE THINKING IN MATHEMATICS

Higher order thinking skills (HOTS) have been a part of important elements in the Malaysia curriculum (Malaysia Education Blueprint, 2013). Many researches had been done previously by researchers to support learning activities to support these skills among students (Acar, 2014; Harun & Salamuddin, 2010).

According to Rachel (2008), these higher order thinking skills also can be injected to diversify of teaching activities in and outside the classroom through creative activities (Rachel, 2008). Through these activities, students will experience the process and it supports the formation of higher-order thinking skills indirectly (Laisema & Wannapiroon, 2014). Based on Revised Bloom Taxonomy, creating process is at the highest cognitive level (Krathwohl, 2002). It gives chances for students to involve with stimulating the learning concept, encourage and develop the thinking abilities that promote HOTS. This is in line with the one of learning mathematics objectives which to make students to think from different angles (Yildiz & Karabiyik, 2012). It is obvious that HOTS can be generated when the process of learning and teaching (L&T) is well conducted.

In conjunction to that, in January 2011, the Ministry of Education (MOE) has changed the Primary School Integrated Curriculum (KBSR) to the Primary School Standard Curriculum (KSSR). Innovation and creativity are parts of new elements incorporated with KSSR. The public knows that innovation and creativity can be injected when the students practice their knowledge in their everyday life. The ability to apply knowledge, skills and values in making of reasoning

and reflection for problem solving, decision making, innovative and able to create something are the elements in the HOTS (MOE, 2013).

According to (Aizikovitsh & Amit, 2011), a conducive learning environment is essential for applying creative thinking. When this happens, an opportunity for the students to think at higher level will happen by itself. Therefore, it is important to apply creative thinking skills more serious and explicit in schools through creative and attractive learning activities, thus students will generate the higher order thinking skills.

THE POTENTIAL OF OUTSIDE CLASSROOM LEARNING STRATEGY IN ENHANCING HIGHER ORDER THINKING SKILLS IN LEARNING MATHEMATICS

Learning outside the classroom essentially can be defined as use of resources out of the classroom to achieve the goals and objectives of learning (Knapp, 2010). Outside classroom learning is any structured learning experience that takes place beyond the classroom environment. The learning process is involves through what the students do, encounter and discover. It is also provides direct experience and the students need to be active in the learning process (Moffett, 2011).

From this mathematics learning experiences, it enhances the process of thinking through the tasks or problems given. Discussion among the students while solving the problems or activities require the mathematical reasoning and creative thinking (Milrad, 2010). It is supported by the research in 2012, where outside classroom learning may enhance the student's reasoning (Sollervall *et. al.*, 2012). This indicates that different method from the traditional is needed to help students develop positive attitudes towards

mathematics (Ifamuyiwa & Akinsola, 2008).

Reading books need to be supported with experiences, so students can understand the content more easily. Theoretical figures 'learning by doing' by John Dewey (1939) says there is a need and close relationship between actual experience and learning. In addition, learning becomes more meaningful due to the atmosphere and situation in contrast to the classroom environment. This raises the atmosphere more cheerful and happy in students (Waite, 2010).

Learning mathematics outside the classroom has the potential to facilitate students to understand the concept of mathematics (Fägerstam & Samuelsson, 2012). It also provides students practically involve with the learning process through the solving problem tasks given (Fägerstam, 2014).

The potential for learning outside the classroom is seen to enhance mathematics learning process more effectively (Fägerstam & Samuelsson, 2012). In addition, it is important for students to make the relationship between learning with creative thinking. Creative will not happen if they just use paper (Pound, 2008). Meaningful learning can be achieved through authentic activities. This will bring the experiences with real life situations involved indirectly. Learning through the outside classroom strategy may give the opportunity for student to enhance the higher order skills.

A study of learning outside the classroom for secondary schools mostly to the subject of geography, biology and environmental education (Rickinson et. al., 2004; Hamilton – Ekeke, 2007; Ballantyne Packer, 2009; Rozenszayn Ben-Zvi Assaraf 2010). However, study of learning outside the classroom for subjects of mathematics in secondary schools is little (Fägerstam & Samuelsson, 2012).

With the significant potential can be obtained from the outside classroom learning strategy, this research aims to look at the extent to think creatively may be enhance in high school students in Malaysia for Mathematics.

CONCLUSION

This conceptual paper present that outside classroom learning strategy will promote the higher order thinking skills in learning mathematics. Higher order thinking skills should become as an identity of Malaysia students in order to fulfill Malaysia Education Blueprint 2013-2025 (Malaysia Education Blueprint, 2013). This hope will become reality when the learning process involve with real life situation. Therefore, for Mathematics which always claim as abstract subject will totally change as the students' experience learning themselves. Conjunction to that, outside classroom learning will be a strategy for the students to 'feel' the mathematics.

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Key Competency and Competencies Criteria among Hard of Hearing Students at the Polytechnic: from Employer's Consen

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ABSTRACT

This study discusses the need for key competencies and competency criteria need to be fulfilled by hard of hearing students in Polytechnic by consent of the employers. The objective of this study is to identify the key competencies and competency criteria in producing Hard of Hearing Career Competency Criteria (KKOKUP) that meet the needs of employers as job's offer standard to hard of hearing graduates. A qualitative approach was used in the early stages of research in the process of forming this KKOKUP using analysis of core journal article and the frequency matrix table. Three experts among employers was selected to verify the findings of the initial analysis. Data were then analyzed again using empirical analysis through Fleiss Kappa Reliability Analysis for the consent of the employer in the industry. Kappa coefficient of 0.809, which showed a good agreement to all defined dimension. Based on this preliminary study, the five key competencies of basic knowledge, communication skills, teamwork, thinking skills and decision-making; and interpersonal skills have been identified as the key competencies needed by hard of hearing students at the Polytechnic. While 34 confirmed significant dimensions and deaf students should master before going out into the job market.

Key word: *key competencies, competencies criteria, hard of*

hearing students, employers

INTRODUCTION

Focus on reducing poverty, promoting employment and career prospects become the first goal of the Incheon Strategy "Make the Right Real" for Person with Disabilities in Asia and the Pacific (2013-2022). This goal can only be achieved by promoting access to knowledge, information and communication. The strategy includes 10 major goals, 27 targets and 62 indicators are intended to be within the planned (ESCAP, 2013). People with disabilities (PWDs) including deaf and hard of hearing people were often ignored in the matter of employment. This led to low participation in the economy and the percentage of disabled people in poverty is higher than normal individuals (Winn & Hay, 2009). Through appropriate education, training and support, it could help PWDs to overcome poverty. PWDs who can work and be able to work should be given the opportunity, support, protection and equipment that allows them to carry out a better job. Poverty transitions should be implemented to increase employment opportunities for people with disabilities. Meanwhile, support to the family can contribute to the achievement of inclusive growth and sustainable development (Trainor, Lindstrom, Simon-Burroughs, Martin, & Sorrells, 2008).

The first target of the Incheon Strategy is to reduce the rate of extreme poverty among the PWDs. Moreover, increasing employment opportunities and careers for PWDs of working age who can and want to work and at the same time improve the PWDs into vocational training programs and employment support programs run by the government will help PWDs to participate in labour market (Singh, 2013). This is because employers today are looking for qualified workers to fill jobs in the organization and meet the needs of the industry. Rapidly growing and competitive industry requires employees who are competent to drive the growth of the organization (Hall, 2010). To help provide a competent workforce, one of the indicator is the percentage of

PWDs who are involved in vocational training programs.

Competence refers to the capabilities required to fulfill a need of employers. It can be translated effectively and continuously include communication skills, teamwork, leadership and lifelong learning (Field, 2008). Competence also can be defined as the capacity or ability to perform tasks and roles determined by standard (Mulder, Gulikers, Biemans, & Wesselink, 2009). Even competencies can also refer to a specific domain which involves a group of knowledge, skills and attitude in relation to employment or necessary generic which can be transferred to a professional situation (Boahin & Hofman, 2013). Competency is an ongoing process and can be achieved through the levels of education and training received by PWDs.

Education for Hard of Hearing Students

In Malaysia, the technical and vocational education has been introduced to hard of hearing students in secondary schools. Students are also given the opportunity to pursue their studies in polytechnics in some courses. These courses offered in an effort to provide competent workers and can be accepted by the labor market but also to meet the criteria required by employers. Students are provided with the knowledge, skill and attitudes that determine their competency to graduating. Introduction to vocational training programs at the Polytechnic began in June 2000 session with the first intake of students in five courses as listed in Table 1 and Table 2 below. The program was subsequently expanded to two other polytechnics in 2009, at the Kota Kinabalu Polytechnic (PKK) and the Tuanku Syed Sirajuddin Polytechnic (PTSS) for Special Skills Certificate Programme (Hotel and Catering Management).

Table 1: *Programme Offered in Poytechnics for Hard of Hearing Students*

Bi l	Programme	Polytechnics
1	Skills Certificate Programme (Sivil Engineering)	Ungku Omar Polytechnic (PUO)
2	Skills Certificate Programme (Mechanical Engineering)	Shah Alam Polytechnics (PSA)
3	Special Skills Certificate Programme (Fashion and Design)	Johor Bahru Polytechnics (PJB)
4	Special Skills Certificate Programme (Hotel and Catering Management)	
5	Special Skills Certificate Programme (Graphic Design)	

Table 2: *Expanded Programme Offered at Polytechnic, Ministry of Higher Education , Jun 2009*

Bil	Programme	Polytechnics
1	Special Skills Certificate Programme (Hotel and Catering Management)	Kota Kinabalu Polytechnics (PKK)
		Politeknik Tuanku Syed Sirajuddin Polytechnics (PTSS)

Hard of hearing students who have similar academic performance with typical students were offered a place in an inclusive learning environment. Students learn together in regular classrooms, and conducting learning activities or training together exceptional students. This situation provides an opportunity for hard of hearing students to improve social skills in different communities

(Claiborne, Cornforth, Gibson, & Smith, 2011). Broader educational opportunities enables hard of hearing students who have a good result can enjoy equal opportunities with regular students to the higher level (Taylor, 2004). Students will gain theoretical and practical training in the institutions as well as through work experience in a real work situation during the implementation of industrial training for work-based experience (Suhaila & Yahya, 2012).

PROBLEM STATEMENT

People with hard of hearing category is the most promising categories of PWDs to put in the job market with ease. This fact proven by Geyer & Schroedel (1998) and D.L. Boutin & Wilson (2009) who found that hard of hearing students can success in improving career mobility and increase revenue after graduating from college or higher education institution. This study was supported by the Yayasan Pembangunan Keluarga Darul Takzim (YPKDT) which revealed that hard of hearing graduates often become the employers choice because they are able to work as par as regular workers and has nearly equal competencies (Rozalina, 2012).

However, based on the Tracer Study 2011, 52.9% of hard of hearing graduates get the first job over the next six months as "Key Success Indicators (KSI), which is set by the Ministry of Higher Education (KPT) (SKPG 2011, 2012). The reasons stated of being unemployed more than six month are because of persueing their study, in the process of placement awaiting and upgrading their skills. Research done by (Tiun Ling Ta, Lee Lay Wah, 2011) revealed that although there was a positive impact on hard of hearing workers employed into the organization, they still require a lot of attention from a supervisor or management due to shortage of skills required by employers. Even they were defined particularly difficult to follow the instructions given and less productive than another colleague (Adnan, 2012).

This research agreed by Sarimah, Norshahril, & Rohana (2011) which recognizes there are inconsistency of the skills learned with skills required by the industry. Even the hard of hearing workers can often be heard in despair, they always expect some friends who work together to advance the interests of jobs and careers that are held. Low self-esteem because of the lack of belonging is also one of the factors of unemployment among hard of hearing people.

The issues raised are still a continuous issue to take care of. Researchers also found that the main problem faced by employers to employ hard of hearing workers in the organization are because of their ability are not on par with normal workers. They might need of special supervision. They also face the problems of working in a team. In addition, disabled workers are less loyal to the job and often leave the job she or he held even less on the quality of the good work (Siti Suhaila, Khadijah, & Yahya, 2013). Thus, the researchers felt that a study should be undertaken to identify what the actual competencies required by employers in the industry so that graduates can actually prepared and before going out into the job market.

OBJECTIVE

This study is the result of first phase of the research. The objectives of the research listed as follows:

1. Identify what the key competencies and the competencies criteria to be mastered by a hard of hearing student at the Polytechnic.
2. Determine the suitability of the core competencies identified by the consent of the employer.

Determine the suitability of competency criteria identified by the employer's consent..

RESEARCH QUESTION

The question is trying to be unlocked through the early stages of the study include:

1. What are the core competencies and competency criteria need to be fulfilled by the hard of hearing students at the Polytechnic.
2. What are the core competencies identified by the consent of the employer.
3. What are the criteria of competence as defined by the employer's consent.

RESEARCH METHOD

For the purpose of forming a Career Competency for Hard of Hearing Students at the Polytechnic (KKOKUP), the survey method used by researchers in the early stages of the study using a qualitative approach. To gather information in a qualitative study, Hassan (2012) suggested that the review of the documents used as a tool best suited for the purpose. Sang (2009) also showed his agreement with the idea and gave further explanation of materials and resources that can be used as a means of gathering information in a qualitative study. Among the materials that can be used to analyze and stay interpretation of data is like the study of literature, books, and scientific papers and journals. Data were analyzed using frequency matrix table to identify the competencies criteria for hard of hearing student's career.

Key competencies and competency criteria have been verified by three experts consisting of employers in selected industries. These findings once again confirmed in Empirical Analysis Reliability Index Agreement using Fleiss Kappa Index. This analysis was chosen because of its ability to measure the level of agreement of nominal or ordinal data generated by multiple raters when

assessing the same sample. The higher the value, the higher the Kappa indicates the experts agreed that the data were evaluated.

Table 3: *Kappa Agreement Scale*

Nilai Kappa	Intrepretasi
Below thab 0.00	Weak
0.0 – 0.20	Not sattisfied
0.21 – 0.40	Less Satisfied
0.41 – 0.60	Moderate
0.61 – 0.80	Good
0.81 ke atas	Very good

The coefficient of agreement was calculated using the formula introduced by Joseph (1971). The formula stated as follows:

$$K = \frac{\text{observed agreement} - \text{chance agreement}}{1 - \text{chance agreement}}$$

or in symbol;

$$K = \frac{Pa - Pc}{1 - Pc}$$

K = Kappa value,

Pa is observed agreement ,

Pc represent the chance agreement at the level of fifty per cent,

N represent the total number of subjects which agreement tested.

RESULT AND DISCUSSION

Table 4: *Comparison of Key Competency by Previous Researcher (LR)*

Based on Table 4 above, the six previous researchers agreed that interpersonal skills, basic knowledge, communication skills, thinking skills and decision-making skills and technology skills are the five key competencies should mastered by hard of hearing students before going out into the job market. While teamwork is not the focus of many researchers involved career competencies.

However, there are differences found after the 1st analysis from journal article given to employers to seek their view regarding what are the competencies needed by the real industry. Teamwork skills seem to be important needed by employers compared to technology skills. However, employers do agreed the important of basic knowledge, communication skills, thinking and making decision skills and interpersonal skills as the most important should be mastered by hard of hearing graduates from polytechnic to be offered in the labor market easily. 38 competencies criteria as listed in Table 5 below have been viewed by employers. Suprisingly, all three employers consent that interpersonal skills are the most important should be develop by students and roles of polytechnic to prepare these students to labor market. Meanwhile, four competencies criteria which is involves in discussion (TS3), effective communication (CS2), using computer effectively and handling email (TCS1, TCS2) dropped from the result because the agreement percentage below than chance agreement 50% (refer to *Appendix 1*).

Table 5: Comparison of Key Competency and Competencies Criteria by Experts (Employers)

BIL	KEY COMPETENCIES	COMPETENCIES CRITERIA	E1	E2	E3
1	<i>Basic Knowledge</i>	Reading Skills	√	√	√
		Using document effectively		√	√
		Numeracy skills	√	√	√
		Writing Skills	√	√	√
		Listening Skills	√	√	
		Using Sign Language Effectively	√	√	√
		Job Knowledge	√	√	√
2	<i>Communication Skills</i>	Deliver Information	√		√
		Effective Communication	√		
		Accept Information Effectively	√		√
		Giving Opinion	√		√
		Asking Skills	√		√
		Giving Responses	√	√	√
		Understand the Conversation	√	√	√
		Using Multi Communication	√	√	√

		n Method			
3	<i>Teamwork Skills</i>	Follow the Order Precisely	√	√	√
		Work in Group	√	√	
		Involves in Discussion	√		
4	<i>Thinking and Making Decision Skills</i>	Flexibel	√	√	
		Creative	√	√	√
		Making Precise Decision	√		√
		Define Problem Skills	√		√
		Problem Solving Capability	√		√
		Able to Express the Idea	√		√
		Seeking Help Skills	√	√	
		Alternative Assesment in Problem Solving	√	√	√
		Define Goal	√	√	
5	<i>Technology Skills</i>	Using Computer Effectively			
		Handling Email			
		Getting Information from Various Resources	√		√
6	<i>Interpersonal</i>	Self Awareness	√	√	√
		Self Confident	√	√	√

<i>Skills</i>	Responsible	√	√	√
	Independent	√	√	√
	Relationship Skills	√	√	√
	Personal Management Skills	√	√	√
	Ready to Learn	√	√	√
	Competent	√	√	√

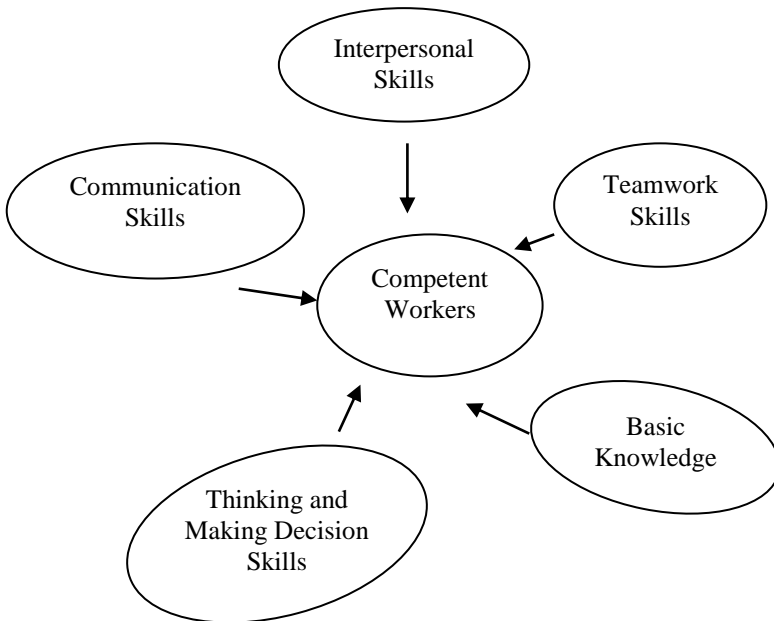


Figure 1: *Key Competencies Needed by Employers Among Hard of Hearing Students in Polytechnics*

As shown in Figure 1, these are key competencies needed by the employers among hard of hearing students in Polytechnics. Curriculum for hard of hearing students includes of technical areas based on programme offered, also theoretical part and personal development. Students are required to have an experience in

working environment while having their industrial training in semester three. In terms of delivering knowledge, skills and attitude to prepare the human capital for the industry, educator in the higher institution such as polytechnics should show their courage and acceptance to these group of students who need career guidance to be independent after graduating from polytechnics. Educators plays a vital role to enhance students motivation, capability and social skills with effective interaction and could increase student's performance (Blalock et al., 2003; Hughes & Valle-Riestra, 2008; Glover, Lampley, Meier, & Scott, 2010; Zhu, Wang, Cai, & Engels, 2013). Educators should apply multi teaching and learning approach for hard of hearing students in the classroom. Educators also need to comprehend the challenges and barriers faced by these students in teaching and learning process so an appropriate approach, method and tools can be applied in daily teaching and learning session. Some of them have the capability as par as normal students and educators role to define the capability and motivate them to produce a good quality of task given.

Establish relationship between polytechnics and employers or human resource management from various industry should be develop to prepare the transition phase for the graduates so that they can be competent suit to industrials needs (Bullock, Gould, Hejmadi, & Lock, 2009). Walk in interview or career awareness should be adressed since in higher education institution so that graduates can prepared enough to face the real work environment, challenges and to sustain in the job.

<i>COMPETENCY / SKILLS</i>	<i>Nick Elskin & Linda Elskin (2001)</i>	<i>Lori Davla & Louise Kursmark (2005)-</i>	<i>Abdul Rahim Abdul Rashid (2006)</i>	<i>P.J Verracchia & Kirsten L.Hutzell (2010)</i>	<i>Ainhoa, Urtasun, Imanol & Nunez (2012)</i>	<i>Song Ju, Dalun Zhang & Jacqueline Pacha (2012)</i>
<i>Basic Knowledge</i>		√	√	√	√	√
<i>Interpersonal Skills</i>	√	√	√	√	√	√
<i>Communication Skills</i>	√	√	√			
<i>Technology Skills</i>			√			√
<i>Teamwork Skills</i>		√				
<i>Thinking And Making Decision Skills</i>		√			√	√

CONCLUSION

Hard of hearing people is also part of the community. They are entitled to education and employment opportunities. The industry should open up wider opportunities for the participation of hard of hearing persons in various areas of the job market. In addition, the physical facilities such as conducive work environment includes an understanding of the disabilities's culture in all levels of the organization can help increase the understanding of them. It can lead to provide opportunities for hard of hearing people to socialize without any communication barriers.

Support from family members, peers, teachers, educational institutions and even government should be in the line. The

hollistic support of these groups can play a significant contribution in boosting the economy. Even disabled people themselves also need to increase the self-development of knowledge, skills and attitude to become an employer of choice to equally contribute to the organization and sustain the job.

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CONSTRUCT FORMATION PERFORMANCE FORECAST BASED EMPLOYABILITY SKILLS (RPKBKE)

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ABSTRAK

Correspondence Employability Skills required by employers with what should be owned by the graduates by job role can impact on the graduates' job performance. The objective of this study was to identify the constructs and dimensions of Employability Skills that can improve the work performance (RPKBKE) of Electronic Polytechnic graduate in Electrical and Electronics Industry. A qualitative method was used in the early stages in the development of research constructs and dimensions RPKBKE of document analysis and expert interview protocol. Document analysis was analyzed using frequency matrices tables and interview data involving experts from industry were analyzed using Fleiss Kappa reliability. Fleiss Kappa reliability analysis is used to determine the overall dimensions of the approval index for each construct RPKBKE. The findings of the overall Kappa coefficient at 0.91 and 0.99 for the industry and the academia stage showed a very good agreement. The results showed that the constructs and dimensions RPKBKE are communication skills, personal qualities, teamwork skills, critical thinking skills and problem solving, technology skills, organizational skills and learning skills.

Keywords: Employability Skills, Graduate Electronic Polytechnic, job roles, construct, dimensions

INTRODUCTION

To succeed and to remain competitive in the era of globalization, employers' in the 21st century are concerned about finding good employees not only with basic academic skills but they are also looking employees with high competitiveness and ability to adjust to rapid changes in the industry (Mohamad Sattar et al., 2009; Yusoff et al., 2010; Shafie & Nayan 2010; Johari et al. 2011; Ahmad Rizal dan Yahya, 2011; Mohd Sahandri G.B et al., 2012; Selvadurai et al., 2012; Mohamad Sattar et.al 2012; Fong et al. 2014).

There are transferable skills that employers like to see in a graduate and these can vary according to type of role; also, in general, graduates are keen to develop their skills further (Raybould & Sheedy, 2005). According Raybould & Sheedy (2005), there has been some consensus of opinion on the importance of “transferable” or “employability” skills for employees. These skills refer to certain personal abilities of an individual, which can be taken from one job role to another, used within any profession and at any stage of their career.

According to Normala & Yahya (2013) employability skill refers to work readiness that is possession of the attributes, skills and knowledge of the graduate should possess to get a satisfying and secure occupation and to ensure they have the capability being effective in the workplace and could also assist to adjust themselves towards various changes and to increase working abilities which suit the working environmental needs. It also implies that employers have an idea of the attributes, skills and knowledge that are necessary for the effective functioning of their organization now and in the future where it's will be benefit to graduate, the workforce, the community and the economy.

Correspondence Employability Skills required by employers with what should be owned by the graduates by job role can impact on the graduates' job performance. Accordingly, in order to strengthen efforts to provide quality graduates, the study on

employability requires sustained effort so that the institution can learn the skills necessary changes by employers to job performance. The objective of this study was to identify the constructs and dimensions of Employability Skills that can improve the work performance (RPKBKE) of Electronic Polytechnic graduate in Electrical and Electronics Industry. Engineering graduates are not only required to have a strong foundation basis in technical skills but they are also required to have non-technical skills such as problem-solving, creativity, leadership, and teamwork

PROBLEM STATEMENT

The twin forces of globalization and internationalization have put a critical demand for resilient graduates who are able to compete at a global level. (Baharun, Suleiman, & Awang, 2012; Fong et al., 2014). According to Velasco (2012), most employers are interested in taking the best candidates to reduce the risk of choosing the "wrong people". Good academic record is no longer a guarantee for graduates to get a job (of adultery, 2011). According to Major, James, & Swamynathan (2013) companies recruiting potential candidates based on academic grades, failed to assess whether students have the skills needed to perform effectively in the workplace.

Employers today expressed concern about finding employees who not only have the basic academic skills but they are also looking for workers who have personal characteristics or values that affect job performance (Mohamad Sattar Rasul et al., 2009; Latisha Asmaak & Surina, 2010; Y.M. Yusoff et al., 2010; Mohamad Sattar et al., 2012; Mohamad Sattar et al., 2013). Employers stressed that graduates lack employability skills required by employers (Maatsch J.L., 1990; Tetreault P.A, 1997; Evers, Frederick T.; Rush, James C.; Berdrow, 1998; Brown, P., Hesketh, A., & Williams, 2003; Lee Fui Tong, 2003; Syed

Hussain, 2005; Heldrich, 2005; Nurita et al., 2007; Gurvinder Kaur & Gurcharan Singh, 2008; Mohamad Sattar, Mohd Ismail, et al., 2009; Azami Zaharim et al., 2009d; Fairuzza, Mohamad Nazuir, & Wahid, 2011; Ahn, Pearce, & Kwon, 2012; Abdul Ghani, 2012; Ministry of Higher Education, 2012b).

Employers think that graduates are not ready to enter and confront the complexities and challenges of the world of work (Freudenberg, B. Brimble & & Cameron, 2011; Tymon, 2011; (Marais & Perkins, 2012) and the resulting unwillingness of graduates are not proficient in the implementation of work procedures (Tetreault P.A, 1997). Failure graduates put themselves in the job market is because they fail to master the skills required by employers who will affect their performance in the workplace (Kamsah, 2004). Employers believe that school is the most responsible way to equip graduates with employability skills. However, the skills, behaviors and attitudes required by the prospective employees (graduates) are different from what is taught during the study. Different perceptions result in a gap between the knowledge, skills and qualities required by employers with what was dominated by graduates (Rohaizat et al., 2012).

According to Tracer Study Report 2011 issued by the Ministry of Higher Education shows that the percentage of engineering graduates who are still unemployed Polytechnic in 2011 was 63.8% (Ministry of Higher Education, 2012a). According Zaliza and Mohd Safarin (2014) the issue of unemployment in Malaysia is not because of lack of employment opportunities, but is due to poor quality of graduates. Yahya (2004) view that graduates good technical skills, without having employability skills are considered to be quality. According to a review of studies that have been made by Thangiah (2008) one of the factors contributing to the unemployed graduates in Malaysia is a 'skills mismatch' where graduates do not have the skills sought by potential employers.

Based on the report of the National Key Economic Areas (NKEA) as stated in The National Graduate Employability (GE) 2012-2017 (Ministry of Higher Education, 2012), there is no clear

specifications about the characteristics properties that need to be established or the characteristics of workers required except for professional courses for every one job in 12 NKEA sectors of Oil, Gas and Energy, Oil, Financial Services, Wholesale and Retail, Tourisms, Business Services, Electrical and Electronics, Information and Communication Technology, Healthcare, Education, Agriculture, the Greater Kuala Lumpur / Klang Valley. There is no consensus on the exact inventory of employability skills needed by graduates for the industry is not a homogenous entity (Pillai et.al, 2012). Although various companies in the same industry sector will have their specific needs. Industrial demand will not be satisfied as long as the clear specification of properties that need to be established or the characteristics of workers who may not be completed.

Accordingly, the Graduate Employability Program by CISEC need to focus on the majority of the employability skills required not only for the acquisition and retention of jobs (Norailis et.al, 2013) but also to increase employment and career advancement based on job role. According to Shweta Tiwari (2012) the gap in terms of ensuring that the industry will be met by the continued development of the skills of the workforce. Therefore, this study aims to further empower CISEC function by providing training about employability skills to polytechnic graduate that actually required by the employer to reduce the unemployment rate among graduates of the Polytechnic.

RESEARCH QUESTION

The research questions are as follows:

- i. What is constructs and dimensions of Employability Skills required by employers electrical and electronics industry in Malaysia.
- ii. What is constructs and dimensions of Employability Skills which can improve the performance of an employee in

the electrical and electronics industry in Malaysia.

METHODOLOGY

A qualitative approach was used in the early stages in the development of research constructs and dimensions RPKBKE of document analysis and expert interview protocol. Document analysis were analyzed using frequency tables and interview data matrices involving experts from the industry analyzed using Fleiss kappa reliability. Fleiss Kappa reliability analysis is used to determine the overall dimensions of the approval index for each construct RPKBKE. The findings overall Kappa coefficient value by the industry is 0.91, which indicates the level of agreement is very good. The results showed that the constructs and dimensions RPKBKE is communication skills, personal qualities, teamwork skills, critical thinking skills and problem solving, technology skills, organizational skills and learning skills.

Scale Fleiss Kappa agreement are as follows:

Table 1 (a) Scale Fleiss Kappa Agreement.

κ	Interpretation
< 0	Poor agreement
0.01 – 0.20	Slight agreement
0.21 – 0.40	Fair agreement
0.41 – 0.60	Moderate agreement
0.61 – 0.80	Substantial agreement
0.81 – 1.00	Almost perfect agreement

Source : Landis and Koch (1977)

RESULT AND DISCUSSION

Document analysis and expert interviews to construct Forecast Performance Based Employability Skills

Table 1 (b) Comparison Table Constructs Forecast Performance Based Employability Skills on Document Analysis

EMPLOYABILITY CONSTRUCT SUMMARY	THE CONFERENCE BOARD OF CANADA (2000) <i>Employability Skills 2000+</i>	SCAN (2001)	EUROPEAN UNION (EU) (DEST 2002)	AUSTRALIAN GOVERNMENT DEPARTMENT OF EDUCATION EMPLOYMENT AND WORKPLACE RELATIONS (2008)	STEM NET (2013)	TOTAL SCORE
Communication Skills	√	√	√	√	√	5/5
Personal Qualities	√	√	√	√	√	5/5
Teamwork Skills	√	√	√	√	√	5/5
Critical Thinking and Problem Solving Skills	√	√	√	√	√	5/5
Technology Skills	√	√	√	√	-	4/5

Organizational Skills	√	√	√	√	√	5/5
Continuously Learning Skills	√	-	√	√	√	4/5

Based on the comments and literature citations are shown in Table 1(b), the researcher has a list of the main constructs that are frequently mentioned by among famous model of employability skills throughout country as a construct Forecast Performance Based Employability Skills are Communication Skills, Personal Qualities, Teamwork Skills, Critical Thinking and Problem Solving Skills, Technology Skills, Organizational Skills and Continuously Learning Skills.

Table 1(c) have shown a result from interview sessions with five Electric and Electronic Human Resources Officer in Malaysia regarding their opinion about with construct of employability skills that they we concerned and really need acquisition show up by graduate especially graduate electronic Polytechnic during interview session.

Table 1 (c) Comparison Table Constructs Forecast Performance Based Employability Skills by Experts

EMPLOYABILITY CONSTRUCT SUMMARY	COMP ANY (1)	COMP ANY (2)	COMP ANY (3)	COMP ANY (4)	COMP ANY (5)	TOTAL SCORE
Communication Skills	√	√	√	√	√	5/5
Personal Qualities	√	√	√	√	√	5/5
Teamwork Skills	√	√	√	√	√	5/5

Critical Thinking and Problem Solving Skills	√	√	√	√	√	5/5
Technology Skills	√	√	√	√	√	5/5
Organizational Skills	√	√	√	√	√	5/5
Continuously Learning Skills	√	√	√	√	√	5/5

Based on the findings of the analysis of documents and interview protocol, it can be stated that the construct Performance Prediction Based Employability Skills include Communication Skills, Personal Qualities, Teamwork Skills, Critical Thinking and Problem Solving Skills, Technology Skills, Organizational Skills and Continuously Learning Skills. Therefore, the formation of these elements may be continued to establish the dimensions of the construct Performance Prediction Based Employability Skills.

Findings Document Analysis Creation Construct Dimensions of Performance Prediction Based Employability Skills

Table 1 (d) Comparison Table Document Analysis Creation Construct Dimensions of Performance Prediction based on Employability Skills

Employability Construct	Employability Dimensions	Comparative Employability Model By Country That Needed By Employers Of Industry					
		THE CONFERENCE BOARD OF CANADA (2000) <i>Employability Skills 2000</i> +	SCANDINAVIAN UNION (EU) (DESET 2002)	EUROPEAN UNION (EU) (DESET 2002)	AUSTRIAN GOVERNMENT DEPARTMENT OF EDUCATION EMPLOYMENT AND WORKPLACE RELATIONS (2008)	STEM NET (2013)	TOTAL SCORE
1) Communication Skills	• Effective Reading Strategies	√	√		√		3/5
	• Effective Writing Strategies	√	√	√	√	√	5/5
	• Using numeracy effectively	√	√		√		3/5
	• Effective Listening Skills	√	√		√	√	4/5
	• Effective Speaking Skills		√		√	√	3/5
	• Share informatio	√	√		√		3/5

	n using a range of information and communications technologies						
2) Personal Qualities	• Responsibility		√	√	√		3/5
	• Self-Esteem	√	√		√	√	4/5
	• Self-Management	√	√		√	√	4/5
3) Teamwork Skills	• Work independently or as part of a team	√	√	√	√		4/5
	• Coaching and mentoring skills	√	√		√		3/5
	• Serves Clients @ Customers	√	√	√		√	4/5
	• Exhibits Leadership	√	√		√		3/5
	• Flexibility	√	√		√		3/5
	• Works with Cultural Diversity	√	√		√	√	4/5
4) Critical Thinking and Problem Solving	• Applies creative, innovative and practical solutions	√	√		√		3/5

Problem Solving Skills	<ul style="list-style-type: none"> • Applies Decision-making Strategies 	√	√	√	√	√	5/5
	<ul style="list-style-type: none"> • Recognizes and Solves Problems 	√	√	√	√	√	5/5
5) Technology Skills	<ul style="list-style-type: none"> • Selects Technology 	√	√	√	√		4/5
	<ul style="list-style-type: none"> • Applies Technology to Task 	√	√		√		3/5
6) Organizational Skills	<p><u>Utilizing Resources</u></p> <ul style="list-style-type: none"> • Manages Time • Manages Money • Manages Materials/ Facilities • Manages Human Resources 		√		√	√	3/5
	<ul style="list-style-type: none"> • Planning process 	√			√	√	3/5
	<ul style="list-style-type: none"> • Adapt to changing requirements and information 	√		√	√		3/5
	<ul style="list-style-type: none"> • Continuously monitor the success of a project 	√			√	√	3/5

	or task and identify ways to improve						
7) Continuously Learning Skills	• Having enthusiasm for ongoing learning	√			√	√	3/5
	• Managing own learning	√		√	√		3/5
	• Assess personal strengths and areas for development	√		√	√		3/5

Expert Insights Interviews Formation of Construct Dimensions of Performance Prediction Based on Employability Skills

Table 1 (e) Comparison Table Expert Insight Interviews Formation of Construct Dimensions of Performance Prediction Based on Employability

Employability Construct	Employability Dimensions	Comparative Employability Skills That Needed By Employers Of Industry Electronic in Malaysia (HR Perspective)					
		COMPANY (1)	COMPANY (2)	COMPANY (3)	COMPANY (4)	COMPANY (5)	TOTAL SCORE
1) Communication Skills	• Effective Reading Strategies		√	√	√	√	4/5
	• Effective	√	√	√	√	√	5/5

	Writing Strategies						
	• Using numeracy effectively		√	√	√	√	4/5
	• Effective Listening Skills	√	√	√	√	√	5/5
	• Effective Speaking Skills	√	√	√	√	√	5/5
	• Share information using a range of information and communications technologies	√	√	√	√	√	5/5
2) Personal Qualities	• Responsibility	√	√	√	√	√	5/5
	• Self-Esteem	√	√	√	√	√	5/5
	• Self-Management		√	√	√	√	4/5
3) Teamwork Skills	• Work independently or as part of a team	√	√	√	√	√	5/5
	• Coaching and mentoring skills		√	√	√	√	4/5
	• Serves Clients @ Customers		√	√	√	√	4/5
	• Exhibits Leadership		√	√	√	√	4/5
	• Flexibility	√	√	√	√	√	5/5

	<ul style="list-style-type: none"> • Works with Cultural Diversity 	√	√	√	√	√	5/5
4) Critical Thinking and Problem Solving Skills	<ul style="list-style-type: none"> • Applies creative, innovative and practical solutions 	√	√	√	√	√	5/5
	<ul style="list-style-type: none"> • Applies Decision-making Strategies 	√	√	√	√	√	5/5
	<ul style="list-style-type: none"> • Recognizes and Solves Problems 	√	√	√	√	√	5/5
5) Technology Skills	<ul style="list-style-type: none"> • Selects Technology 		√	√	√	√	4/5
	<ul style="list-style-type: none"> • Applies Technology to Task 		√	√	√	√	4/5
6) Organizational Skills	<p><u>Utilizing Resources</u></p> <ul style="list-style-type: none"> • Manages Time • Manages Money • Manages Materials/Facilities • Manages Human Resources 	√	√	√	√	√	5/5
	<ul style="list-style-type: none"> • Planning process 		√	√	√	√	4/5
	<ul style="list-style-type: none"> • Adapt to changing requirements and information 		√	√	√	√	4/5

	<ul style="list-style-type: none"> Continuously monitor the success of a project or task and identify ways to improve 		√	√	√	√	4/5
7) Continuously Learning Skills	<ul style="list-style-type: none"> Having enthusiasm for ongoing learning 		√	√	√	√	4/5
	<ul style="list-style-type: none"> Managing own learning 		√	√	√	√	4/5
	<ul style="list-style-type: none"> Assess personal strengths and areas for development 		√	√	√	√	4/5

From a documents analysis shown in Table 1 (d) the the researcher has a list of the 27 main dimensions that are frequently mentioned by among famous model of employability skills throughout country to formation dimensions as a construct Forecast Performance Based Employability Skills. Dimensions for Communication Skills construct are effective reading strategies, effective writing strategies, using numeracy effectively, effective listening skills, effective speaking skills and share information using a range of information and communications technology. Dimensions for Personal Qualities construct are responsibility, self-esteem and self-management. Mean while dimensions for Teamwork Skills are work independently and as part of a team, coaching and mentoring skills, serves clients or customers, exhibits leadership, flexibility and works with cultural diversity.

Applies creative, innovative and practical solutions, applies decision-making strategies and recognises and solves problem are formation for Critical Thinking and Problem Solving Skills. Technology Skills construct consists of select technology and

applies technology to task. Dimensions for Organisational Skills construct are utilizing resources such as manages time, manages money, manages materials facilities, manage human resources. Planning process, adapt to changing requirements and information and continuously monitor the success of project or task and identify ways to improve also dimensions are include in Organisational Skills construct. Lastly dimensions for Continuously Learning Skills construct are having enthusiasm for ongoing learning, managing own learning and assess personal strengths and areas for development.

Table 1(e) have shown a result from interview sessions with five Electric and Electronic Human Resources Officer in Malaysia regarding their opinion about dimensions construct of employability skills that graduate should acquisitions as are asset to make sure they can do a work. Almost the 27 dimensions are agree by them to perform dimensions of the construct of Forecast Performance Based Employability Skills

Based on the analyzes that were conducted as described above, researchers have identified a finding that led to the formation of 27 dimensions contained in the seven constructs built. Through the process of analyzing these data, construct Forecast Performance Based Employability Skills required by the electrical and electronics industry in Malaysia and can improve work performance can be established and recognized as a construct Forecast Performance Based Employability Skills (RPKBKE)

Elements and dimensions has been reviewed by five experts and the approval has been granted. According to Fleiss qualitative research whether the five people who specialize in qualitative research methods and content of the study. In this study, the agreement obtained is

$$K = (Pa - Pc) / (1 - Pc)$$

K = Kappa Value

Pa = Observed Agreement

Pc = Chance Agreement

The findings of Fleiss Kappa coefficient values as a whole is 0.914, indicating a very good level of agreement.

CONCLUSION

Overall, the findings from the analysis of documents and interviews demonstrate construct protocols Forecast Performance Based Employability Skills are Communication Skills, Personal Qualities, Teamwork Skills, Critical Thinking and Problem Solving Skills, Technology Skills, Organizational Skills and Continuously

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AKTIVITI PEMBELAJARAN AKTIF MENERUSI PENGINTEGRASIAN PROGRAM ZOOM-A BAGI PEMBELAJARAN SAINS

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ABSTRAK

Penggunaan bahan pengajaran berasaskan web iaitu program Zoom-A telah digunakan secara meluas oleh sekolah-sekolah rendah diseluruh Malaysia. Program pembelajaran interaktif melalui internet ini telah dilancarkan pada tahun 2004 oleh Timbalan Menteri Pembelajaran. Program ini mendapat sambutan yang baik daripada warga pendidik kerana ia menyediakan pelbagai kemudahan yang dapat membantu memperbaiki pencapaian murid. Namun penggunaan Program Zoom-A memerlukan bersama aktiviti pembelajaran yang baik dan sesuai agar penggunaanya menjadi lebih efektif dan mampu meningkatkan pencapaian pelajar. Justeru menerusi kajian ini, pengintegrasian Program Zoom A dengan aktiviti pembelajaran berdasarkan strategi pembelajaran aktif telah dihasilkan. Tiga aktiviti pembelajaran aktif oleh Simmons & DiStasi (2008) telah diubahsuai dan digunapakai mengikut tahap dan situasi pelajar yang dikaji iaitu Number Head Together, soalan dan jawapan bersama dan strategi sepuluh dua. Jumlah responden yang terlibat adalah seramai 35 orang pelajar di sebuah sekolah rendah Johor Bahru. Analisis data kajian ini dibuat menggunakan perisian Statistical Package for Social Sciences (SPSS) 18.0. Hasil kajian menunjukkan terdapat perbezaan yang signifikan tahap pencapaian pelajar melalui ujian pra dan pos berasaskan kandungan menerusi Ujian Zoom A. Secara keseluruhan, melalui ujian-t yang

dilaksanakannya menunjukkan terdapat perbezaan yang signifikan min skor pelajar sebelum dan selepas mengikuti aktiviti pembelajaran berdasarkan kepada strategi pembelajaran aktif dengan penggunaan bersama Program Zoom-A. Walau bagaimanapun, merujuk kepada ketiga-tiga aktiviti yang dijalankan, didapati aktiviti strategi sepuluh dua mendapat min tertinggi berbanding yang lain dan secara langsung melalui aktiviti pembelajaran ini memupuk kepada sikap bekerja salam kumpulan. Kesimpulannya dapat dikatakan dengan aktiviti pembelajaran aktif dengan penggunaan bersama Program Zoom-A mampu meningkatkan tahap pencapaian pelajar dan menyokong kepada pembelajaran aktif dalam kalangan mereka.

Kata Kunci: Program Zoom-A, Pembelajaran Aktif, Number Head Together, soalan dan jawapan bersama & strategi sepuluh dua

1.12 PENGENALAN

Pendidikan merupakan suatu usaha berterusan untuk memperkembangkan lagi potensi individu dalam melahirkan modal insan yang berilmu pengetahuan dan mampu berdikari. Hasrat ini termaktub dalam Falsafah Pendidikan Kebangsaan yang menentukan arah haluan, asas dan sumber inspirasi kepada semua usaha dan rancangan dalam bidang pendidikan di Malaysia.

Pada tahun 2003, satu dasar baru pendidikan diperkenalkan iaitu Pengajaran Pendidikan Sains dan Matematik dalam Bahasa Inggeris (PPSMI). Tujuan dasar baru ini diperkenalkan adalah untuk memperkukuhkan dan meningkatkan penguasaan bahasa Inggeris di kalangan pelajar Malaysia. Namun, pada tahun 2009 dasar PPSMI mulai dimansuhkan secara berperingkat dan sepenuhnya pada 2012. Melalui PPSMI, sesi pengajaran dan pembelajaran Sains lebih banyak menggunakan komputer bagi menyampaikan isi pengajaran.

Justeru, salah satu bahan pengajaran berasaskan web seperti program Zoom-A telah digunakan secara meluas oleh sekolah-

sekolah rendah diseluruh Malaysia. Program ini telah dilancarkan pada tahun 2004 setahun selepas dasar PPSMI dilancarkan oleh Kementerian Pendidikan Malaysia. Program pembelajaran interaktif melalui internet menerima sambutan yang baik daripada warga pendidik kerana ia menyediakan pelbagai kemudahan yang dapat membantu memperbaiki pencapaian murid. Program ini menyediakan soalan bagi matapelajaran Sains, Matematik, Bahasa Inggeris dan Bahasa Malaysia.

Sepertimana yang sering diutarakan, pencapaian murid di sekolah rendah merupakan suatu persoalan dan harapan yang seringkali dikaitkan dengan guru dan bahan pengajaran yang digunakan dalam sesi pengajaran guru tersebut. Oleh yang demikian, kajian ini dijalankan bagi menghasilkan satu panduan dalam mengaplikasikan program Zoom-A di dalam sesi pengajaran Sains di sekolah rendah.

Ibubapa seringkali mempertikaikan langkah, pendekatan dan cara guru mengajar yang dikatakan tidak sesuai bagi anak-anak mereka agar lebih berminat, bermotivasi serta aktif dalam pembelajaran mereka. Sesetengah guru dikatakan tidak membuat persediaan yang lengkap sebelum memulakan sesi pengajaran dimana guru sepatutnya menyediakan bahan bantu mengajar (BBM), rancangan mengajar dan pembacaan awal. Guru yang tidak bersedia akan menyebabkan kelas yang diajarnya menjadi kurang efisien dan tidak mampu menarik perhatian murid untuk belajar seterusnya menjejaskan pencapaian mereka.

Justeru itu, pengkaji memilih untuk menghasilkan satu panduan aktiviti pembelajaran yang dapat digunakan di dalam kelas dengan mengaplikasikan penggunaan program Zoom-A iaitu menerusi strategi pembelajaran aktif. Dalam kajian yang dijalankan ini, Pengkaji akan memilih beberapa strategi berdasarkan kepada pembelajaran aktif untuk diaplikasikan bersama program Zoom-A. Pengkaji berharap dapat menghasilkan satu panduan aktiviti pembelajaran yang dapat digunakan agar peningkatan pemahaman dan pencapaian pelajar dalam mata pelajaran Sains dapat dicapai. Keperluan dalam menghasilkan panduan aktiviti pembelajaran ini adalah disebabkan oleh tiada lagi

panduan dihasilkan sebelum ini berkenaan pengintegrasian aktiviti pembelajaran bersama dalam penggunaan Program Zoom-A disekolah.

1.13 OBJEKTIF KAJIAN

Berikut adalah objektif kajian:

- a) Mengenal pasti aktiviti pembelajaran yang terbaik berasaskan strategi pembelajaran aktif dengan pengintegrasian Program Zoom A terhadap tahap pencapaian pelajar melalui ujian pra dan pos.

1.3 KAJIAN LITERATUR

Kajian dijalankan untuk menghasilkan satu panduan mengaplikasikan program Zoom A dalam proses pengajaran dan pembelajaran mata pelajaran Sains di sekolah rendah. Panduan ini bertujuan untuk meningkatkan prestasi akademik murid di sekolah rendah dengan bantuan program Zoom A.

Justeru itu, di dalam bab ini, pengkaji akan mereka bentuk dan mengenal pasti aktiviti pembelajaran yang sesuai menerusi pengintegrasian Program Zoom A di dalam kelas dengan mengaplikasikan strategi pembelajaran aktif untuk meningkatkan tahap pencapaian pelajar.

1.3.1 *Pembelajaran Aktif*

Pembelajaran aktif ialah pembelajaran utama dan pendekatan pengajaran yang memerlukan pelajar untuk mengambil bahagian secara aktif dalam pembelajaran mereka. Ia meningkatkan membolehkan pelajar untuk mendalami apa yang mereka telah diterokai dan dapat menggunakan pembelajaran dalam kehidupan seharian mereka. Pembelajaran aktif menyumbang dengan ketara untuk memupuk keyakinan, disiplin dan kawalan diri dalam

pelajar. Mayer (2004) menekankan bahawa pembelajaran yang terbaik disokong oleh kaedah-kaedah pengajaran yang melibatkan aktiviti kognitif dan bukannya aktiviti tingkah laku.

1.3.2 Kaedah Pembelajaran Aktif

Pembelajaran aktif merangkumi pelbagai kaedah pengajaran seperti perbincangan dalam kumpulan kecil, pembelajaran koperatif, main peranan, ‘*hands-on project*’, dan soal siasat yang didorong oleh guru. Dalam pembelajaran aktif, gabungan pendekatan pengajaran digunakan untuk merangsang pembelajaran pelajar dengan gaya pembelajaran yang berbeza. Teknik pembelajaran aktif termasuk visual, auditori dan aspek pembelajaran kinestetik. Simmons & DiStasi (2008) menggambarkan aktiviti pembelajaran aktif yang memerlukan pelajar menggunakan pelbagai teknik pembelajaran, menggalakkan pengekalan sejumlah besar maklumat dan menggalakkan interaksi sosial yang lebih besar melalui perbincangan rakan sebaya. Guru dalam pelbagai mata pelajaran dan tahap dicadangkan supaya menggunakan strategi pembelajaran aktif.

1.3.3 Zoom A

Program Portal Zoom-A bukan sahaja mengandungi bahan latihan dan ujian untuk murid, malah menyediakan pelbagai aplikasi yang dapat membantu meningkatkan prestasi murid. Selain itu, murid dapat mengulangkaji serta menjalani ujian tanpa had dan mempelajari kaedah untuk mendapatkan jawapan yang betul melalui tunjuk cara di atas talian. Dalam satu kajian yang dijalankan oleh Losinin Johalin (2010) bertajuk “Program Zoom-A Meningkatkan Keberkesanan Pembelajaran Asas Kendiri Pelajar”, beliau mendapati bahawa 100% responden mengakui bahawa program Zoom-A adalah portal pembelajaran akses sendiri yang berkesan dan menarik. Dapatan juga menunjukkan bahawa semua responden mempunyai sikap yang positif, minat dan motivasi yang

tinggi terhadap Program Zoom-A. Berdasarkan temu bual bersama guru pula 81.25% daripada responden menyatakan bahawa Program Zoom-A sangat membantu dalam pembelajaran akses sendiri pelajar

1.4 DAPATAN KAJIAN

Bahagian ini memaparkan hasil analisis data serta dapatan kajian yang diperolehi bagi tiga aktiviti pembelajaran yang dijalankan dengan pengintegrasian bersama Program Zoom A.

Hasil kajian yang telah dijalankan, sebanyak 35 soalselidik telah dikembalikan oleh responden. Semua data yang diperolehi dianalisis menggunakan perisian Statistical Package for Social Sciences (SPSS) version 18.0.

1.5.1 Analisis Latar Belakang Responden

Jadual 2 : Taburan Bilangan Dan Peratusan Responden Mengikut Pengalaman Menggunakan Program Zoom A

Pengalaman Zoom A	N	Peratus
2 tahun	5	14.3
3 tahun	7	20.0
4 tahun	16	45.7
5 tahun	7	20.0
Jumlah	35	100.0

Seramai 5 orang atau 14.3 peratus terdiri daripada responden yang mempunyai pengalaman menggunakan Zoom A kurang 2 tahun. 7 orang responden atau 20.0 peratus mempunyai pengalaman menggunakan Zoom A antara 3 dan 5 tahun. Seramai 16 orang responden atau 45.7 peratus mempunyai pengalaman menggunakan Zoom A lebih 4 tahun. Daripada data yang diperolehi, didapati majoriti responden mempunyai pengalaman

menggunakan Zoom A kurang 4 tahun.

1.5.2 Analisis Data Tahap Pencapaian Pelajar

Bahagian ini memaparkan data analisis secara keseluruhan bagi pencapaian pelajar dalam ujian pra dan pos berdasarkan kandungan bagi mata pelajaran Sains iaitu sebelum dan selepas menggunakan progam Zoom A.

1.5.2.1 Data Ujian Pra dan Pos Berasaskan Kandungan

Merujuk kepada jadual 3, di dapati bahawa terdapat perbezaan min markah pelajar dalam ujian pra dan pos. Berdasarkan kepada analisis ujian-t pula, didapati keputusan kajian adalah signifikan ($t = -12.613$, $df = 34$, $p < .05$). Hipotesis nul ditolak dan pengkaji membuat keputusan bahawa terdapat perbezaan pencapaian pelajar dalam ujian pra dan pos tersebut. Nilai skor min yang lebih tinggi setelah pelajar menjalani ujian pos dapat dilihat pada jadual 3 dengan nilai skor min tertinggi adalah 42.2 daripada 50 markah.

Jadual 3 :Statistik ujian-t bagi sampel berpasangan bagi ujian pra-pos

Pasangan	Min	Sisihan Piawai	t	Sig. (2 tailed) p
Pra Ujian	29.46	5.606	- 12.61 3	0.000
Pos Ujian	42.2	3.81		
Pra Ujian ~ Pos Ujian				

*N = 35

1.5.2.2 Perbandingan Min Sebelum dan Selepas Menjalani Aktiviti Number Head Together.

Jadual 4 : Perbandingan Min Terhadap Aktiviti *Number Head Together* Berdasarkan Ujian T.

		Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
Paired	Mean D1A	3.1529	34	.49984	.08572	.157	.376
	Mean D1	4.4353	34	.28485	.04885		

Jadual 5: *Paired Samples Test* Terhadap Aktiviti *Number Head Together* Berdasarkan Ujian T.

	Paired Differences			df	Sig. (2-tailed)
	Std. Deviation	95% Confidence Interval of the Difference			
		Lower	Upper		
MeanD1A - MeanD1	.53511	-1.46906	-1.09564	34	.000

Jadual 5 menunjukkan perbandingan min skor responden sebelum dan selepas menjalani aktiviti *Number Head Together*. Keputusan analisis skor ujian-t bagi kedua-dua min mendapati bahawa terdapat perbezaan yang signifikan. Ini dapat dilihat dengan lebih jelas menerusi min skor sebelum menjalani aktiviti adalah 3.15 dan telah meningkat kepada 4.44 selepas menjalani aktiviti *Number Head Together*.

1.5.2.3 Perbandingan Min Sebelum dan Selepas Menjalani Aktiviti Soalan dan Jawapan Bersama.

Jadual 6 : Perbandingan Min Terhadap Aktiviti Soalan Dan Jawapan Bersama Berdasarkan Ujian T.

		Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
Paired Sample T	Mean D2A	3.1714	35	.38849	.06567	.092	.601
	Mean D2	4.4343	35	.29300	.04953		

Jadual 7: *Paired Samples Test* Terhadap Aktiviti Soalan Dan Jawapan Bersama Berdasarkan Ujian T.

	Paired Differences		df	Sig. (2-tailed)	
	Std. Deviation	95% Confidence Interval of the Difference			
		Lower			Upper
MeanD2A - MeanD2	.46469	-1.42248	1.10323	34	.000

Jadual 7 menunjukkan perbandingan min skor responden sebelum dan selepas menjalani aktiviti 'soalan dan jawapan bersama'. Keputusan skor ujian-t mendapati bahawa terdapat perbezaan yang signifikan. Perkara ini sejajar dengan nilai skor min yang berbeza dan memaparkan peningkatan sebelum menjalani aktiviti 3.17 kepada 4.43 selepas menjalani aktiviti soalan dan jawapan bersama.

1.5.2.4 Perbandingan Min Sebelum dan Selepas Menjalani Aktiviti Strategi Sepuluh Dua

Jadual 8 : Perbandingan Min Terhadap Aktiviti Strategi Sepuluh Dua Berdasarkan Ujian T.

		Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
Paired Sample T	Mean D3A	3.2381	35	.22246	.03760	.303	.077
	Mean D3	4.4905	35	.27695	.04681		

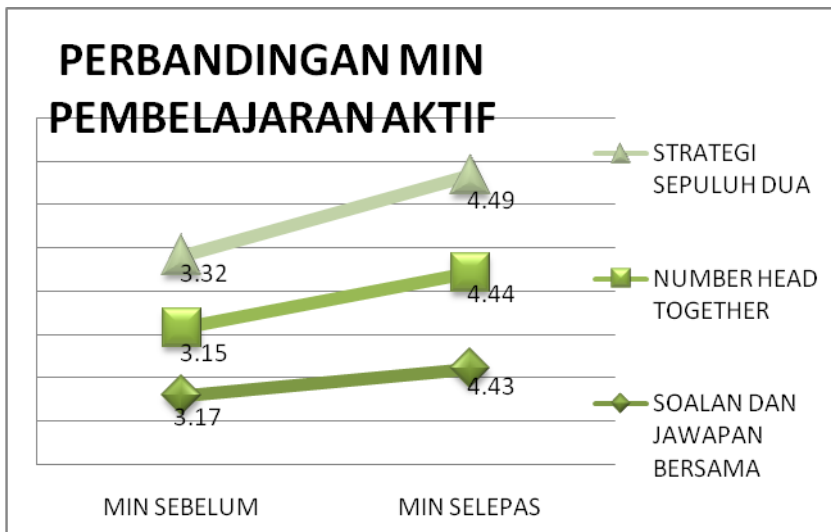
Jadual 9: *Paired Samples Test* Terhadap Aktiviti Strategi Sepuluh Dua Berdasarkan Ujian T.

	Paired Differences			df	Sig. (2-tailed)
	Std. Deviation	95% Confidence Interval of the Difference			
		Lower	Upper		
Mean D3A - Mean D3	.29806	-1.35477	1.14999	34	.000

Jadual 9 turut mempamerkan perbezaan dalam skor min responden. Menerusi ujian-t yang dilaksanakan didapati terdapat perbezaan yang signifikan. Perbezaan ini dapat dilihat dengan jelas melalui perbezaan min skor iaitu 3.24 yang seterusnya meningkat kepada 4.49 selepas menjalani aktiviti strategi sepuluh dua.

1.5.2.5 Perbandingan Min Keseluruhan Aktiviti Pembelajaran Aktif.

Perbandingan min bagi ketiga-tiga aktiviti yang dijalankan mendapati min bagi aktiviti strategi sepuluh dua mencatatkan min tertinggi iaitu 4.49 berbanding aktiviti *Number Head Together* yang mencatatkan min 4.44. Manakala aktiviti soalan dan jawapan bersama hanya mencatatkan min 4.43



1.6 KESIMPULAN

Hasil daripada dapatan yang diperolehi, dapatlah dirumuskan bahawa aktiviti pembelajaran aktif yang terbaik adalah strategi sepuluh dua. Aktiviti berbentuk tugas didalam kumpulan ini mempunyai kesan yang sangat besar dalam pencapaian pelajar. Ini dapat dilihat melalui peningkatan markah pelajar yang sangat berbeza dari dua ujian pada aktiviti sebelumnya. Aktiviti dalam strategi sepuluh dua sangat berbeza daripada kelas tradisional yang mana hanya berpusatkan kepada guru semata-mata. Hasil kajian ini selari dengan kajian oleh Hamann dan Wilson (2003),

dimana dalam kajian mereka mendapati bahawa pencapaian pelajar yang menyertai kelas atas talian adalah lebih baik daripada pelajar di dalam kelas pembelajaran tradisional.

Berdasarkan dapatan kajian, penyelidik mendapati bahawa peningkatan prestasi ujian pelajar dalam ujian Zoom A setelah menjalani aktiviti berdasarkan strategi ini adalah disumbangkan oleh aktiviti yang berjaya menarik perhatian pelajar. Ini selaras dengan kajian yang dijalankan oleh Norhani Bakri *et al* (2005) punca utama prestasi pembelajaran yang lemah pelajar berpunca daripada faktor teknik belajar didalam kelas. Kajian tersebut mendapati bahawa cara pembelajaran yang tidak konsisten dan tiada inisiatif untuk berusaha seperti kelas tradisional merupakan faktor utama yang menjejaskan prestasi pembelajaran pelajar.

Dengan perlaksanaan aktiviti pembelajaran aktif bersama Zoom A ini diharapkan dapat mengubah sikap kebanyakan guru yang masih terikat dengan sukatan mata pelajaran yang akhirnya menyebabkan guru mengajar dengan hanya berlandaskan buku teks semata-mata tanpa mengaplikasikan sebarang kaedah pengajaran yang lebih kreatif. Pembelajaran aktif dapat membantu mengatasi masalah ini dimana terdapat pelbagai pendekatan strategi pembelajaran aktif yang boleh digunakan dalam pengajaran dan pembelajaran yang bukan sahaja dapat menangani masalah kurang minat pelajar dalam subjek Sains, malah dapat meningkatkan kefahaman dan pencapaian pelajar dalam mata pelajaran ini.

Penggunaan aktiviti pembelajaran ini boleh diaplikasikan dan diubah bergantung kepada kreativiti guru. Dalam kaedah ini, guru dapat menerapkan unsur permainan, aktiviti kumpulan dan pembentangan supaya kefahaman pelajar akan terbentuk apabila pelajar itu berfikir sendiri untuk mendapatkan jawapan dan maklumat yang diperlukan. Disamping itu, kelebihan strategi pembelajaran aktif ini dapat mewujudkan interaksi sosial diantara pelajar dan dipupuk terutama semasa aktiviti kumpulan dijalankan.

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LEVEL OF PROBLEM POSING AMONG PRIMARY SCHOOL STUDENTS IN MALAYSIA

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Kashefi

ABSTRACT

This study is a research on Level of Problem Posing among Primary School Students. The ability to pose problems has been in children from a very young age where children ask about the world around us. In problem posing, the goal of the students is not to solve a given problem but creating a new problem from the given answer based on the students' daily situation and experiences. The use of problem posing in mathematics activities among students makes them less dependent on one right answer syndrome as its is used in the mathematics classroom nowadays. Students who can pose problems are people who are more flexible, diverse thinkers and become learners who are active and creative. At the same time, promotes their level of curiosity. In addition, problem posing increases pupils' creativity, self efficacy and promotes a positive attitude towards the mathematics learning.

Keywords: Problem Posing; Primary School; Students

INTRODUCTION

In mathematics education, one of the main important aims is to make students good in solving mathematics problems so that the daily life problems that they encounter in their lives can be easily overcome. Those who are good and can solve problems related to mathematics effectively can solve day-to-day problems easily.

Moreover, in the current mathematics education, one of the main components is the usage of appropriate technology tools to be incorporated in the teaching and learning of mathematics at all levels for all students.

Problem posing is a vital component of the mathematics discipline (Stickles, 2006). Problem posing is a method of teaching that incorporates modeling of problem solving skills by the teacher (Craig, 1999). In 1988 itself, Brown and Walter recommended that problem posing types of strategies should be incorporated within the context of standard mathematics courses rather than reserved for a previous course here and there: We look forward to the time that a special course on problem posing would be redundant (p.131).

Therefore, since then, till now, problem posing has been overlooked and still not emphasized in the teaching and learning of mathematics, even though it has lots of benefits. Encouraging students to pose mathematical problems builds their natural curiosity, creativity and at the same time, students become more involved in authentic mathematics tasks and come up with more than one solution for each task rather than one answer only for each task.

Teachers often assign students with textbook problems that often have one solution for one task which is arrived only by following a particular procedural step. Early educators must move away from posing mathematics problems with one way to reach a solution to offering mathematics experiences with things and situations that are meaningful to children (Wallace, Abbott, & Biary, 2007). Many students do not have much experience in problem posing as most of the time problems are created by the teachers instead of the students. The issue of considering the provision of expert model problems to support problem posing for students has attracted relatively little attention and is worth examining (Ju-Yuan Hsiao, Chun-Ling Hung, Yu-Feng Lan & Yoau-Chau Jeng, 2013).

BACKGROUND

The purpose of education should be to teach pupils to think. The world is changing so rapidly it makes no sense to ask pupils to memorize facts and theories that could change tomorrow. Instead, we must teach pupils how to learn, how to find and evaluate information and be independent learners. There is a clear need for mathematics teachers to experience a change in the world view of mathematics learning.

Adopting the belief that mathematics is a human activity and that mathematical meaning is constructed as a result of such activity would be a step towards alleviating the influence, formalism and the abstracted, symbolic presentation of mathematical rules and the procedures that it encourages. The belief can have far reaching consequences for mathematics teaching. The most fundamental job facing mathematics teachers is to foster the development of conceptual understanding to foster mathematical meanings in their student.

The development of conceptual understanding for all pupils requires the mathematics curricula and the environment for teaching and learning different from most current practice (Effandi & Norulbiah, 2011). When pupils learn mathematics, each of them comes to the classroom with an only one of its kind of experiences, beliefs and ability that they use to construct their mathematics knowledge. Effective teaching can takes place when teacher has the understanding of the knowledge constructed by their pupils in a topic of learning in early stages of mathematics learning.

In the process of teaching and learning of mathematics, problem posing is one of the components that are of pertinent in assessing and evaluating pupil's developmental knowledge. Recent reforms in the mathematics curricula around the world have advocated that problem posing activities be a more prominent feature in the mathematics classroom (Yuan & Sriraman, 2010; Brown & Walters, 2005; Yeap, 2000; Kilpatrick, 1987).

In other words in the mathematics classrooms, problem posing can be applied as a goal or as a means of instruction. Using

problem posing as a goal of instruction involves asking pupils to respond to a range of problem-posing prompts. For example,

a) In a market, a fruit seller sells a basket that has 3 apples and 5 oranges. The fruit seller has 100 apples and oranges. Pose a question for this problem for your friend to solve.

b) To bake a cake, a baker uses 100g of sugar and 200g of flour. The baker has 1kg of sugar and 2kg of flour. Pose a question for this problem for your friend to answer.

When pupils begin posing their own original mathematical questions and see these questions become the focus of discussion, their perception of the subject is profoundly altered. When they get to spend time working on these questions, their ownership of the experience produces excitement and motivation.

DEFINITION OF PROBLEM POSING

According to Bonotto (2010), mathematics problem posing is defined as a process that takes place using personal interpretation of concrete situation of the students and then making it into a meaningful mathematical problem by formulating them. Problem posing can also be viewed as a leaning activity in which teachers create mathematics problem to be solved by the pupils and it can also be seen in terms of learning activities in which pupils create mathematics problems for different situations such as daily situations (Stoyanova, 2005). Meanwhile, according to Gonzales (1996) and Stickles (2006), mathematical problem posing is new problem generation or old problem reformulated into a new problem. In problem posing, the goal of the students is not to solve a given problem but creating a new problem from the given answer based on the students' daily situation and experiences.

Each student has the opportunity to build mathematical power as high as possible and it is essence of vision of a quality mathematics programme and alternative to develop mathematical

power in students through the generation of mathematical problems by the students themselves (Zakaria & Ngah, 2011). In classrooms, a lot of emphasis and attention is given to the students ability to solve mathematical problems and less emphasis and attention is paid on their ability to pose mathematical problem on the given solution or answer.

IMPORTANCE OF PROBLEM POSING

From a view of cognitive point, the natural endowment of the human's mind can be sustained by problem posing for bootstrapping (Singer, 2009) and thus, may contribute in authentic stimulated activities development in the classroom (Singer, Ellerton & Cai, 2013). Here, students thinking are investigated from different perspectives where there are analogous patterns in the ways of their generation of problems to see their understanding in mathematics. Personal interest of the student can be linked with their mathematics education which plays an important role in the usage of problem posing.

Since the nature of problem posing requires creativity, imagination and exploration encouraging students to write their own words of problems results in their increasing participation in classroom environment (Demir, 2005). The use of problem posing in mathematics activities among students makes them less dependant on one right answer syndrome as its is used in the mathematics classroom nowadays. Students who can pose problems are people who are more flexible, diverse thinkers and become learners who are active and creative. At the same time, promotes their level of curiosity.

DEVELOPMENT OF PROBLEM POSING

Recent developments in mathematics education research have shown that creating active classrooms, posing and solving cognitively challenging problems, promoting reflections, metacognition and facilitating broad ranging discussions which enhances pupils understanding of mathematics at all levels (Knott, 2010). Problem solving is a convergent task in which a learner extracts a mathematical structure from give information and reaches a correct answer but problem posing is a synthetic activity and a divergent task that fundamentally has multiple answers (Kojima, Miwa, & Matsui, 2011).

As problem posing is beginning to be incorporated into mathematics classrooms, it is important to continue to document students capabilities as problem posers (Grundmeier, 2002). The National Council of Teachers of Mathematics (NCTM) has encouraged teachers in creating discourse for students using problem posing questions and activities that promote higher order mathematical thinking skills in students. Moreover, NCTM has asked teachers to pose meaningful problems to their students to probe their understanding and reorganize their conceptualization (NCTM, 2000). Even though, problem posing has many benefits but in reality, it is not as popular as problem solving in the teaching and learning of mathematics.

STUDIES ON PROBLEM POSING

From researchers and studies of literature of Brown & Walter (1993), English (1998, 2004) and Silver (1994), it is recognized that one of the important part of the mathematics curriculum is problem posing and it is the core of most activities in mathematics. However, in primary school mathematics classroom, the evidence of the usage of problem posing in mathematics activities is very little.

Scholars recognized that problem posing plays an important role in the mathematics activity but in the mainstream of

mathematics education, problem posing has not yet been the major focus of research. Many studies have shown that problem posing can give student a positive impact (Abu-Elwan, 2006, Nicolaous & Philippou, 2007, Bonotto, 2008) and many countries have realized its importance and started implementing problem posing in their education system. Researchers have slowly begun to realize that developing the ability to pose mathematics problems is at least as important, educationally as developing the ability to solve them (Abu-Elwan, 1999).

According to a study done by Sharifah & Zanzali (2006), the ability for students to pose problems are still limited. There are still students in mathematics classroom who are still unable to pose problems. Most of the students have the ability to only pose problems involving addition and subtraction operation but not involving multiplication and division operation where students should have the ability to generate more complex mathematical problems. This difficulty is due to the lack of mathematics knowledge, the students' attitude themselves (not-confident and creative) and the problem posing nature itself (Akay & Boz, 2009).

What is new is the awareness that problem posing need to pervade the education systems around the world, both as a mean of instruction (meant to engage genuine learning activities that produce deep understanding of mathematics concepts and procedures) and as an object of instruction (focused on developing students proficiency in identifying and formulating from unstructured situations) with important targets in real life situations (Singer, Ellerton & Cai, 2013).

ABILITY AND UNDERSTANDING OF PROBLEM POSING AMONG STUDENTS

A very important method of learning the mathematics subject is through problem posing. Problem posing is the ability of a student in creating new problems and recreating the problem that is give to the pupils.

At the same time, with their problem awareness, pupils are encouraged to find out and pose problems which enhances pupils ability of reasoning and reflection, more flexible thinking and pupils have more confidence. It is crucial to generate diverse problems by extracting several solutions from one situation or by recalling multiple situations to which one solution can be adapted (Kojima, Miwa & Matsui, 2011).

Many problem posing activities through pedagogical innovation should be emphasized in the teaching and learning of mathematics. It is very important for students to pose mathematical problems as it encourages mathematical thinking. A deeper understanding of the topic can be developed when students are challenged in mathematical problem posing. These problem posing activities can give a positive influence to the students in their ability of problem solving activities and their attitude towards mathematics.

Research on problem posing has increased attention to the effect of problem posing on pupils' mathematical ability and the effect of task format on problem posing (Leung & Silver, 1997). The ability of pupils in solving mathematics problems is enhanced through problem posing skill. One of the challenges in the teaching and learning of mathematics is to learn how to construct mathematical tasks (Crespo, 2003).

There is a positive link between the ability of problem posing and the pupils' mathematical achievement. If pupils are able to pose problems, this will show that they know the concepts of mathematics that they have learnt through understanding and not through procedural steps in solving problems.

The role of mathematics teachers should no longer focus on demonstrating a set of procedures to be remembered one by one by pupils, but more importantly, is to create opportunities for pupils to think mathematically and construct their own mathematical knowledge via problem posing activities (National Council for Teachers of Mathematics, NCTM, 2000).

However, there is still lack of deep understanding of the nature of teaching and its basic problem such as how to deal with

the relationship among problem posing, creating situation, problem solving and teaching goals (Xia, Lu & Wang, 2008). Therefore, a teachers' task is not only to teach solving problems but also to teach how to pose problems.

According to Akay and Boz (2010), problem posing can give positive impact towards the pupils' attitude and self-efficacy. Therefore, pupils in the mathematics classroom should be participated and nurtured by teachers to pose problem in order to improve the skills of problem solving which indirectly makes pupils more creative and critical thinkers.

STRATEGIES IN PROBLEM POSING

The initial steps in the problem posing plan of action target the students' skills in inquiry where students learn to be skillful in posing thoughtful and challenging questions not only of themselves but of others (Gonzales, 1998).

Different types of strategies are imposed by educators in the mathematics classroom activities to encourage children to have the ability to pose problems to be good problem poser as they already have the ability of solving problems and are good problem solvers. There is a relationship between the ability to solve problems and performance to pose problems in mathematics classroom. Furthermore, the process of problem solving plays a big part in the competency to pose problems in students.

Not all students are able to pose problems by asking probing questions and investigate questions and for those students who lack of this ability, should begin with activities that require them to ask question which aids the students thinking process. The strategies that can be implied in the classroom depends on mathematics content to be taught, children's level of understanding, learning objectives and learning outcomes of the lesson and mathematical thinking process involved. Problem posing can be classified into three strategies which are free problem posing situation, semi-structured problem posing situation

and structured problem posing situation.

Free Problem Posing Situation

There are problems that are related to our daily live situations (encounters) where students are encouraged to generate problems based on their daily situations by asking students to “make a easy or difficult problem” or “create a problem to be used in a mathematics quiz, competition or test”. Students pose problems without any restriction. Educators play an important role in this where when the mathematics content is taught, the educators should relate them to real life situations and then make or ask them to come up with new problems. The types of problem posing situation that students might use to derive new problems are situation in their daily lives, problems that students like, mathematics quiz or competition related problems, and problem to friend or to have fun. On the contrived basis or naturalistic situation, students have to come up with a new problem or generate a new question based on the answer on a specific topic such as proportional reasoning.

Semi-Structured Problem Posing Situation

A problem posing situation where students are given an open situation and are invited to explore the structure or to finish it using the knowledge, skills, concepts and relationships from their previous mathematical experiences (Demir, 2005). Using students mathematical skills, mathematics concepts and relationships and mathematics knowledge and understanding, students are to explore different types of problems that can be posed when they are given an open situation which may be in the form of problems that are open-ended or problems that are similar to the given problems or similar situation problems or using specific theorem or given pictures to derive problems. In short, from a given answer or calculation, students are asked to pose questions by using pictures,

equations, specific solution methods and specific concepts driven aid.

Structured Problem Posing Situation

‘What if not?’ strategy is one of the tool in structured problem posing situations where the problems’ data and question components are examined by the students and then the problem is manipulated with the asking process of ‘what if not?’. It is a situation where students pose problems by reformulating already solve problems or by varying the conditions or questions of given problems (Pittalis, Christou, Mousoulides, & Pitta-Pantazi, 2004). In short, students have to generate a new problem which is related to the give structured problem or give solution of a problem.

CONCLUSION

Problem posing is very important in the teaching and learning of mathematics as it aids pupils by improving their problem solving skills and it is more orientated on inquiry instruction where pupils have to think to come up with a problem. At the same time, problem posing also develops and increases pupils’ creativity, self efficacy and promotes a positive attitude towards the mathematics learning. Problem posing activities in mathematics not only enhances pupils thinking but also could enrich and consolidate their understanding related to the mathematical concepts and processes (Sharifah & Nor Azlan, 2006 as cited in English, 1997; Brown & Walter, 1993).

Therefore, teachers in schools should not emphasize on remembering procedures in answering questions but should give and allow pupils to have the opportunity to create their own mathematical knowledge. Different student has different ability in problem posing based on their understanding of the mathematics knowledge. Current curricula focus on the processes of exploration, communication and conceptualization through the

classroom activities rather than presenting a plethora of facts in traditional way (Güven, 2012).

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CABARAN KURSUS PENDEKKEUSAHAWANAN DI DALAM PEMBELAJARAN SEPANJANG HAYAT DI KOLEJ KOMUNITI KEMENTERIAN PENDIDIKAN MALAYSIA

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ABSTRAK

Isu pengangguran dan sosio ekonomi sesuatu komuniti penduduk telah menjadi satu cabaran kepada kerajaan. Pihak kerajaan tidak dapat menyediakan peluang pekerjaan sepenuhnya kepada sesebuah komuniti secara keseluruhan.. Telah banyak aduan, rungutan, kenyataan serta keluhan didengari dan tidak kurang juga langkah-langkah, saranan serta gesaan yang telah dibuat oleh kerajaan, individu dan persatuan-persatuan berkaitan. Namun jawapan secara tuntas masih belum diperolehi. Walaupun begitu satu langkah yang dilihat praktikal disarankan bagi mengatasi kemelut isu sosio ekonomi ini iaitu dengan memperluaskan kesedaran didalam kerjaya keusahawanan melalui peranan yang di mainkan oleh Kolej Komuniti Kementerian Pendidikan Malaysia melalui pendekatan kursus pendek. Tahap pendidikan golongan sasaran bukanlah satu isu yang perlu diutamakan. Masing-masing mempunyai tempat, kaedah dan peranan didalam menjayakan proses keusahawanan. Data-data yang diambil bagi memperlihatkan hal-hal berkaitan keusahawan boleh membantu untuk memperkasakan strategi kearah menjayakan keusahawanan ini. Seterusnya cadangan-cadangan yang positif boleh

diketengahkan dan diperhalusi. Diharap usaha untuk memperkasakan kemahiran dan penglibatan dalam bidang keusahawanan dikalangan golongan sasaran dapat mengatasi isu penting iaitu pengangguran dan sosio ekonomi di semua pelusuk komuniti negara kita.

1.0 PENGENALAN

Falsafah Pendidikan Kebangsaan menekankan pembangunan potensi individu secara menyeluruh dan bersepadu yang dapat memberi sumbangan terhadap masyarakat dan negara. Bidang keusahawanan merupakan salah satu bidang yang dapat mengembangkan potensi ini. Kerjaya keusahawanan didapati masih belum begitu mendapat tempat dikalangan rakyat di negara kita. Malah kerjaya dalam bidang keusahawanan masih dilihat sebagai pilihan kedua atau terakhir walaupun bidang keusahawanan merupakan satu kerjaya yang dipandang mulia dalam Islam (Abu Bakar & Muhammad, 2005). Isu pengangguran telah menjadi satu bebanan kepada kerajaan kerana pihak kerajaan tidak dapat menyediakan peluang pekerjaansecukupnya. Justeru, salah satu penyelesaian kepada masalah pengangguran ini adalah melalui pembabitan secara meluas dalam bidang keusahawanan. Bagi mencapai matlamat tersebut, antaranya usaha-usaha khusus yang telah dilakukan oleh Kementerian Pembangunan Usahawan, Kementerian Belia dan Sukan serta Kementerian Pendidikan Malaysia.

Walaupun terdapatpeningkatan dalam kecenderungan siswazah memilih bidang keusahawanan sejak kebelakangan ini, namun bilangan mereka yang menceburi kerjaya keusahawanan masih kurang memberangsangkan. Kajian pengesanan siswazah Universiti Utara Malaysia membuktikan bahawa kurang dari 0.4 peratus siswazah yang telah melibatkan diri dalam bidang keusahawanan (Mohd. Salleh 2002a; Zolkafli ct al.2004). Kajian yang dijalankan oleh Morshidi ct al. (2004) yang juga mendapati siswazah kurang meceburi bidang keusahawanan sebagai kerjaya

pilihan. Secara rumusan, dapat dikatakan hanya 1.3 peratus daripada 2,275 orang siswazah telah menceburi bidang ini. Malah kebanyakan siswazah didapati tidak melihat peluang-peluang perniagaan yang ditawarkan dalam bidang keusahawanan sebagai profesion yang dapat menjamin masa depan mereka.

Kegagalan melihat peluang-peluang tersebut telah menyebabkan para siswazah tidak peka terhadap bidang keusahawanan yang boleh dijadikan sebagai satu kerjaya alternative. Akibat daripada ketidakpekaan ini, lebih daripada 31,000 orang siswazah yang menganggur dalam tempoh enam bulan selepas tamat pengajian pada tahun 2007 (Kementerian Pengajian Tinggi, 2008). Isu pengangguran siswazah ini telah menjadi satu bebanan kepada kerajaan kerana pihak kerajaan tidak dapat menyediakan peluang pekerjaan mencukupi kepada siswazah yang tamat pengajian. Justeru, salah satu penyelesaian kepada masalah pengangguran ini ialah melalui pembabitan yang meluas dalam bidang keusahawanan (Salmah, 2006).

2.0 LATARBELAKANG

Berdasarkan kepada pernyataan di atas, kajian-kajian lepas telah mendapati hanya individu-individu tertentu sahaja yang akan memilih bidang keusahawanan sebagai kerjaya pilihan. Apabila diselidiki, golongan ini selalunya mempunyai persepsi yang positif terhadap bidang keusahawanan. Malah berpendapat bahawa hanya bidang keusahawanan dapat memberi mereka kepuasan sama ada dari segi material (pendapatan lumayan) ataupun pengiktirafan. Mereka juga boleh menggunakan kreativiti serta kemahiran yang dimiliki dengan bebas tanpa perlu kebenaran sesiapa dalam mengusahakan kerjaya mereka (Kuratko & Hodgetts, 2004: Bird, 1989). Matlamat pendidikan keusahawanan ialah untuk membentuk pelajar sebagai pencipta kerja yang berpotensi dan bukan sebagai pencari kerja. Bekerja sendiri dan memiliki perniagaan adalah satu opsyen yang realistik untuk pelajar. Malangnya, kebanyakan mereka tidak melihat keusahawanan

sebagai satu alternatif kerjaya pilihan. Kajian yang dibuat di negara barat telah membuktikan bahawa pendidikan keusahawanan adalah berkait rapat dengan keputusan untuk memulakan perniagaan atau tidak. Kajian itu juga telah menunjukkan pengalaman, potensi, ciri keusahawanan, sikap, hobi, persepsi keusahawanan sendiri dan ide perniagaan adalah pengaruh yang kuat terhadap aspirasi keusahawanan.

Semasa bengkel bertajuk Pembelajaran untuk kehidupan, kerja dan masa depan (LLWF) di Bostwana pada tahun 2000, ciri-ciri usahawan yang dapat dikenalpasti terdiri daripada kreatif dan imiginasi, bebas dalam pemikiran dan tingkahlaku, kebolehan mengambil inisiatif, percaya kepada diri dan optimisme, kebolehan untuk menerima tanggungjawab, berkemahiran sosial, kemampuan untuk mengambil keputusan dengan ketidakpastian, kebolehan untuk menilai dan mengambil risiko, fleksibel, tekad untuk berjaya, kebolehan menyelesaikan masalah serta kemampuan bekerja keras. Ciri-ciri ini berpotensi menghasilkan usahawan yang berpengetahuan dan berkemahiran dalam mengenalpasti peluang perniagaan, mengurus sumber perniagaan, memula perniagaan dan mengambil risiko.

3.0 DASAR PEMBANGUNAN KEUSAHAWANAN, INSTITUSI PENGAJIAN TINGGI (IPT)

Dasar Pembangunan Keusahawanan Institusi Pengajian Tinggi (IPT) adalah bertujuan untuk menggalakkan dan memantapkan pembangunan keusahawanan yang lebih terancang dan holistik di kalangan IPT tempatan dalam usaha untuk;

- 3.1 Melahirkan modal insan yang berkualiti dan mempunyai pemikiran, atribut dan nilai keusahawanan; dan
- 3.2 Melahirkan lebih ramai lagi usahawan siswazah yang akan bertindak sebagai pemangkin kepada transformasi ekonomi negara

kepada ekonomi berpendapatan tinggi dan berpaksikan inovasi kearah pencapaian status Negara maju menjelang tahun 2020.

4.0 TERAS STRATEGIK DASAR PEMBANGUNAN KEUSAHAWANAN IPT

Enam (6) Teras Strategik Dasar Pembangunan Keusahawanan IPT telah ditetapkan:

- 4.1 Menubuhkan Pusat Keusahawanan di setiap IPT.
- 4.2 Menyediakan Pendidikan dan Program Keusahawanan yang terancang dan holistik.
- 4.3 Memantapkan Program Pembangunan dan pengukuhan keusahawanan.
- 4.4 Mewujudkan Mekanisme Pengukuran yang berkesan.
- 4.5 Menyediakan persekitaran dan ekosistem yang kondusif bagi pembangunan keusahawanan; dan
- 4.6 Mengukuhkan kompetensi tenaga pengajar keusahawanan.

7.0 DASAR PENUBUHAN KOLEJ KOMUNITI KPM

Diantara peranan utama kolej komuniti adalah :

- 7.1 Sebagai sebuah institusi pendidikan yang memberi latihan serta kemahiran kepada masyarakat setempat yang memerlukannya.
- 5.2 Memberi peluang dan laluan alternative kepada pelajar lepasan menengah dan yang tercicir dalam sistem pendidikan, pekerja-pekerja serta masyarakat setempat untuk melanjutkan pendidikan dalam bidang latihan dan kemahiran yang mereka minati.
- 5.3 Sebagai pusat latihan yang fleksibel dalam penawaran kursus, syarat kemasukan dan umur dengan penawaran kursus sepenuh masa dan separuh masa berdasarkan keperluan masyarakat setempat.
- 5.4 Sebagai one stop centre yang menyediakan keperluan pendidikan lepasan menengah dan sebelum ke pasaran

kerja ataupun melanjutkan pendidikan ke peringkat yang lebih tinggi.

Matlamat pelaksanaan kursus pendek Kolej Komuniti Kementerian Pendidikan Malaysia adalah untuk menyediakan peluang latihan kepada semua lapisan masyarakat setempat untuk meningkatkan kemahiran dan pengetahuan serta taraf sosio ekonomi melalui program pembelajaran sepanjang hayat yang fleksibel dan mudah alih. Kesemua kolej komuniti diberi tanggungjawab melaksanakan kursus pendek dibawah unit Pengajian Sepanjang Hayat (PSH) melalui KPI (Key Performance Indexs) tahunan masing-masing.

6.0 PELAN PENGUKUHAN KEUSAHAWANAN JABATAN PENGAJIAN KOLEJ KOMUNITI (JPKK)

Memberi tumpuan dalam usaha mewujudkan pelajar Kolej Komuniti dan masyarakat setempat yang memiliki ciri-ciri dan kompetensi keusahawanan, berdaya saing dan mempunyai jati diri yang tinggi selari dengan kehendak Dasar Pembangunan Keusahawanan Institusi Pengajian Tinggi. Matlamat utama pelan ini ialah menyediakan garis panduan dalam melaksanakan program-program keusahawanan di Kolej Komuniti bagi tujuan untuk melahirkan lebih ramai modal insan yang mempunyai pemikiran ,atribut dan nilai keusahawanan.

Dalam usaha untuk mencapai matlamat di atas, Jabatan Pengajian Kolej Komuniti telah merangka Pelan Pengukuhan Keusahawanan Kolej Komuniti berdasarkan 6 teras Dasar Pembangunan Keusahawanan IPT iaitu:

- 6.1 Menubuhkan Pusat Pembangunan Keusahawanan di JPKK dan di Kolej Komuniti;
- 6.2Menyediakan pendidikan dan program keusahawanan di JPKK dan di Kolej Komuniti;
- 6.3Memantapkan program pembangunan dan pengukuhan keusahawanan;
- 6.4Mewujudkan mekanisme pengukuran berkesan;

- 6.5 Menyediakan persekitaran dan ekosistem yang kondusif bagi pembangunan Keusahawanan; dan
 6.6 Mengukuhkan kompetensi penyelarass keusahawanan.

7.0 CABARAN DAN HARAPAN

Merujuk kepada maklumat yang diperolehi dari sumber yang dinyatakan terdapat beberapa cabaran dikenalpasti. Kajian lebih terarah kepada bilangan peserta kursus pendek yang telah dilaksanakan di kolej komuniti dari tahun 2002 hingga 2009 dan cabaran yang wujud. Berikut adalah data-data yang diperolehi,

STATISTIK KURSUS PENDEK KOLEJ KOMUNITI (2002 hingga 2009)

TAHUN	BIL. KURSUS	BIL. PESERTA
2002	79	1,771
2003	316	8,216
2004	867	23,907
2005	1,324	46,512
2006	2,436	71,684
2007	3,778	102,445
2008	4,321	106,814
2009	3,052	72,360
JUMLAH	18,442	480,581

Jadual 1: Data Pelaksanaan Kursus Pendek Kolej Komuniti dari Tahun 2002 - 2009.

(Sumber :Bahagian Pembangunan Akademik, JPKK tahun 2000).

TERDAPAT 5 KATEGORI PELAKSANAAN KURSUS PENDEK TAHUN 2009

PROGRAM	BIL. KURSUS	BIL. PESERTA	KOS (RM)
A. PENGUKUHAN GRADUAN Cth Kump. Peserta : pelajar sem. Akhir KK @ Poli / graduan KK / graduan Politeknik / graduan IPT	415	10,043	60,888
B. KEUSAHAWANAN Cth Kump. Peserta : K/tgn k'jaan, k/tgn swasta, pelajar, belia, warga emas, OKU, ibu/bapa tunggal, komuniti setempat	413	8,240	413,838
C. RESKILLING Cth Kump. Peserta : K/tgn k'jaan, k/tgn swasta, pelajar, belia akademik rendah, warga emas, OKU,	1,702	42,787	294,401

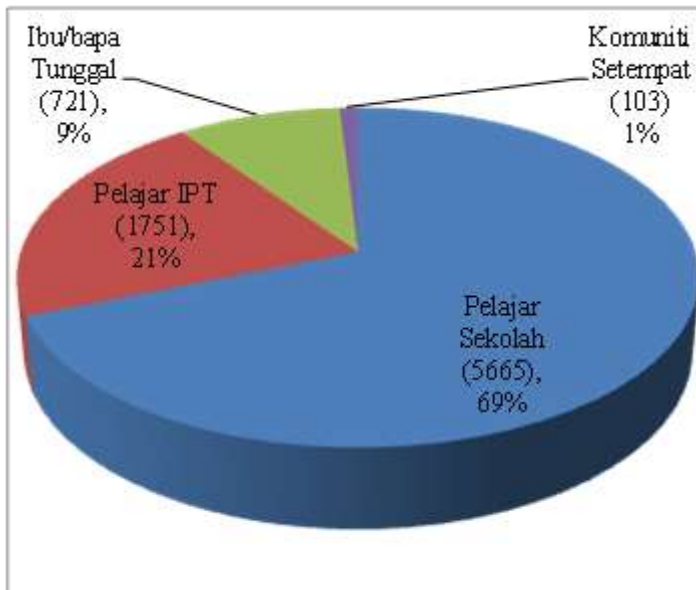
ibu/bapa tunggal, komuniti setempat			
D. PEMBASMI KEMISKINAN Cth Kump. Peserta : miskin bandar, miskin luar Bandar, ibu/bapa tunggal	174	3,461	101,29 2
E. WARGA PRIHATIN Cth Kump. Peserta : belia tercicir @ berpencapaian akademik rendah, warga emas, OKU, ibu/bapa tunggal, miskin, orang asli, kakitangan diberhentikan kerja	348	7,829	77,658
JUMLAH	3,052	72,360	948,08 0

Jadual 2 : Pelaksanaan Kursus Pendek Kolej Komuniti dari 01 Januari 2009 sehingga 31 Disember 2009. (Sumber : Bahagian Pembangunan Akademik JPKK 2010)

B. KEUSAHAWANAN

BIL. KURSU S	BIL. PESER TA	KOS (RM)	TABURAN PESERTA	JUMLAH
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413	8240	413,838	Pelajar Sekolah	5665
			Pelajar IPT	1751
			Komuniti Setempat	103
			Ibu/bapa Tunggal	721
			JUMLAH	8240



Carta Pai : Kategori keusahawanan mengikut peratusan.

Pemerhatian pada tahun 2009 menunjukkan seramai 72,360 bilangan peserta kursus pendek warga komuniti melalui 3052 jenis kursus telah berjaya dijalankan diseluruh negara dengan bilangan kolej komuniti sebanyak 74 buah ketika itu dengan kos keseluruhan sebanyak RM 948,080.50. (Sistem Data Keusahawanan JPKK 2012). Daripada jumlah itu hanya 413 jenis kursus dengan bilangan peserta sebanyak 8240 dengan kos RM

413,838.75 terlibat dalam program latihan kursus pendek berteraskan keusahawanan. Taburan peserta meliputi 4 bahagian iaitu pelajar sekolah, pelajar IPT, komuniti setempat dan ibu/bapa tunggal.

Dapatan dari pemerhatian serta kajian awal penulis menunjukkan terdapat cabaran yang perlu diatasi dan diperhalusi supaya keberkesanan program latihan kursus pendek berteraskan keusahawanan tersebut tercapai. Fenomena ini menunjukkan bahawa kursus pendek keusahawanan yang dijalankan di Kolej Komuniti mempunyai cabaran yang perlu diatasi. Perancangan dan matlamat yang jelas serta tersusun mengenai hala tuju program latihan kemahiran berteraskan keusahawanan perlu diperkasakan. Antara cabaran itu adalah;

7.1 Dengan bilangan 8240 peserta kursus pendek dalam bidang keusahawanan tahun 2009 berbanding bilangan 74 buah kolej komuniti seluruh negara dengan anggaran sebuah kolej komuniti ialah 114 peserta. Dengan kos yang tinggi iaitu RM413,838.75 berbanding kursus-kursus lain, apakah bentuk pengukuran untuk mengenalpasti matlamat tercapai seperti yang dikehendaki. Adakah penggunaan tenaga pengajar luar dalam pelaksanaankursus pendek ini berjaya memenuhi matlamat yang difokuskan.

7.2 Perlunya mekanisma asas bagi pemilihan peserta kursus pendek yang berteraskan keusahawanan diwujudkan agar peserta kursus yang di pilih bersesuaian dan menepati ciri-ciri ke arah keusahawanan, Kreteria pemilihan boleh digubal dalam pelbagai bentuk yang mudah diisi atau diekses oleh pemohon. Dengan cara tersebut matlamat akan mudah tercapai.

7.3 Apakah mekanisma bagi menentukan jenis-jenis kursus pendek yang dilaksanakan menepati istilah program latihan kursus pendek berteraskan keusahawanan. Ianya perlu ditentukan bagi mencapai matlamat iaitu sesuatu kursus pendek dilaksanakan kepada peserta yang mempunyai tahap ilmu dalam lingkungan pembelajaran. Kaedah ini akan lebih berkesan kerana menjurus kepada peserta sasaran.

7.4 Bentuk dan mekanisma penilaian yang diambil bagi

melakukan tindakan susulan selepas peserta pendek menghadiri latihan. Diantaranya data rekod perkembangan pemantauan, bentuk soalselidik, lawatan tapak dan pelaporan. Ini penting bagi mencorak dan mengenalpasti kepelbagaian tindakan baru.

7.5 Jalinan Kolaborasi dan kerjasama strategik dengan agensi/kementerian/swasta/berkanun bagi menjayakan pelaksanaan program latihan kursus pendek berteraskan keusahawanan. Kerjasama dengan pelbagai agensi awam, swasta atau berkanun akan dapat mengenalpasti kelemahan dan kekuatan suatu pelaksanaan. Yang pasti apabila melalui beberapa proses perubahan yang positif akan dapat melahirkan kejituan matlamat asal.

7.6 Penyediaan modul latihan / kurikulum yang digunakan perlu mendapat pengiktirafan dan menepati kehendak matlamat penubuhan dalam pelaksanaan program latihan ini. Peranan pelbagai pihak berkepentingan dituntut dalam penggubalan kurikulum tersebut.. Segala kelemahan dan kekuatan sesuatu bentuk kursus perlu diperhalusi sesuai dengan tahap penerimaan sesebuah kelompok komuniti sasaran.

7.7 Pengisian norma perjawatan di kolej komuniti perlu diperhalusi serta tenaga pengajar yang mengajar kursus di luar bidang perlu belajar secara informal untuk lebih kompeten. Pengamalan pembelajaran secara informal dapat memberi sumbangan kepada individu dalam tiga aspek utama iaitu aspek kemahiran, pengetahuan dan sikap positif. Ketiga-tiga aspek ini memberikan manfaat yang sangat berguna dalam mempelajari dan mendalami sesuatu bidang ilmu.

7.8 Format borang atau akses yang digunakan untuk permohonan peserta kursus pendek perlu dikaji semula supaya berupaya menarik jumlah permohonan. Matlamat memberi ilmu secara menyeluruh kepada sesebuah komuniti perlu diutamakan lebih-lebih lagi berkaitan taraf sosio ekonomi.

Proses pembudayaan akan dapat diamalkan secara menyeluruh dalam pelaksanaan kursus pendek keusahawanan tersebut dengan perancangan yang sistematik. Pendekatan yang bersepadu memberi cabaran kepada prestasi dan kejayaan

organisasi. Ia haruslah mengikut kitaran latihan yang bermula dengan analisis keperluan latihan, merekabentuk latihan, melaksana dan menilai program latihan (Brooks 1995;Goldstein 1993). Secara umumnya cabaran ini akan dapat di atasi menerusi penelitian dan tindakan kajian. Ia perlu dilihat secara berterusan bagi mewujudkan pengukuhan yang memiliki ciri dan kompetensi keusahawanan, berdaya saing serta mempunyai jati diri selari dengan Dasar Pembangunan Keusahawanan Institusi Pengajian Tinggi.

8.0 KESIMPULAN

Di dalam suasana ekonomi dan peluang kerja yang terhad masakini, kursus keusahawanan perlu diperkasakan dan diterapkan ke dalam diri setiap individu terutamanya penduduk komuniti setempat. Diharapkan mereka dapat berdikari dengan mencari, mencipta , mengisi dan mengambil peluang pekerjaan berasaskan keusahawanan selepas tamat tempoh pembelajaran. Kemahiran ini penting bukan sekadar untuk mudah diterima bekerja di bawah majikan, tetapi bekerja sendiri dengan kesanggupan menerima risiko terhadap sesuatu yang diusahakan. Untuk itu pelbagai kementerian dan jabatan berkaitan harus mengembling tenaga dan pemikiran bagi mengenalpasti cara terbaik dari pelbagai sudut agar peranan yang diamanahkan berjaya dicapai. Justeru itu para pengkaji disaran untuk membuat kajian yang lebih mendalam dengan idea-idea lebih bersesuaian di dalam mendepani cabaran ini.

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PEMBIAYAAN PENDIDIKAN: PERSPEKTIF GURU SEKOLAH RENDAH DI BANDAR MAKASSAR

Andriani & Mahani Binti Mokhtar

ABSTRAK

Pembiayaan pendidikan sering menjadi bahan perbincangan hangat di semua peringkat. Di peringkat sekolah sering dibangkitkan isu bagaimana mendapatkan ataupun bagaimana penggunaan dana yang telah disediakan. Kajian ini menggunakan pendekatan mixed method bagi mengkaji isu pembiayaan pendidikan di sekolah rendah berdasarkan perspektif guru di bandar Makassar, Negeri Sulawesi Selatan, Indonesia. Seramai 53 orang guru yang telah terlibat sebagai responden kajian dengan menjawab soal selidik serta enam orang guru yang telah terlibat di temubual. Kajian ini mendapati bahawa terdapat segelintir guru yang belum mengetahui mengenai penggunaan dana di sekolah. Selain dari pada itu kajian ini juga menunjukkan bahawa alat dan prasarana yang diberikan kerajaan masih belum mencukupi serta tidak bersesuaian dengan apa yang diperlukan di sekolah. Selain dari pada itu masih terdapat sekolah yang belum sepenuhnya melibatkan guru dalam penyusunan anggaran pembiayaan sekolah.

Kata Kunci: Pembiayaan pendidikan, perspektif guru

PENGENALAN

Pembiayaan pendidikan masih menjadi masalah besar di negara Indonesia terutama di peringkat pendidikan asas. Pembiayaan pendidikan mempunyai pengaruh terhadap kualiti pendidikan kanak-kanak. Seiring dengan hal berkenaan pihak kerajaan baik kerajaan pusat maupun kerajaan daerah mengadakan berbagai program pembiayaan pendidikan yang diharapkan dapat membantu dalam menaja keperluan pelajar di sekolah. Misalnya saja diadakannya program dana BOS, dana Pendidikan Gratis, sekolah bersubsidi penuh, bantuan untuk siswa miskin dan lain sebagainya. Namun kenyataan yang ada masih terdapat berbagai masalah yang menyangkut pembiayaan di sekolah terutama pada tingkat pendidikan asas.

Pada pelbagai wilayah Indonesia masih ramai terdapat kanak-kanak yang belum dapat menikmati pendidikan sejak pendidikan asas (Hudha, 2010). Oleh itu, yang menjadi tugas kerajaan Indonesia adalah bagi menangani masalah berkenaan. Seiring masalah di atas salah satu matlamat daripada *Millenium Development Goals* (MDGs) adalah mencapai pendidikan asas bagi semua, yang telah dijadikan keutamaan oleh kerajaan pada tahun 2009-2014 (Hudha, 2010).

Setiap warga negara wajib untuk mengikuti pendidikan asas dan kerajaan wajib menaja dan bertanggung jawab bagi menjamin kewujudan dana bagi penyelenggaraan pendidikan bagi setiap warga negara pada umur 7-15 tahun seperti yang disenaraikan dalam Akta Pendidikan atau UU No 20 tahun 2003. Selain itu kerajaan juga menetapkan bajet pendidikan minimum sebanyak 20% daripada APBN (Anggaran Pendapatan dan Belanja Negara) mahupun daripada APBD (Anggaran Pendapatan dan Belanja Daerah). Walaubagaimanapun bajet berkenaan tetap tidak mencukupi kerana ianya termasuk gaji guru (Idris, 2010). Hal berkenaan telah memperlihatkan kesungguhan kerajaan dalam membangunkan perkhidmatan pendidikan (Supriadi, 2003;

Toyamah & Usman 2004).

Pada masa sentralisasi dalam sistem pendidikan nasional, kerajaan pusat memainkan peranan utama, termasuk mengenai peruntukan pembiayaan pendidikan (Jalal & Mustafa, 2001). Pada masa ini, pengurusan sentralistik kurang memberi maklumat kepada pengurusan sekolah agar kreatif mengembangkan organisasi sekolah, kurikulum, mengembangkan penyertaan masyarakat serta menguruskan kemudahan dan sumber belajar (Firman & Tola, 2008).

Pembiayaan pendidikan merupakan nilai wang dari segala sumber daya atau segala perbelanjaan yang berbentuk barangan atau wang yang digunapakai untuk aktiviti pendidikan (DBE1, 2011; Ghazali, 2005). Mengikut Hallak (1985) bayaran bagi keluarga merupakan wang sekolah yang dibayar serta banyaknya dana hasil yang mesti dibayar, serta bayaran alternatif yang merupakan pendapatan yang hilang kerana menyekolahkan anak-anak. Sedangkan bagi perspektif negara, Psacharopoulos (1995) mengatakan terdapat kos yang ditimbulkan oleh pelajar sendiri iaitu pendapatan yang akan diterima selama belajar serta bayaran yang dibelanjakan semasa proses pembelajaran.

Kajian Kurniady (2011) mendapati bahawa pada peringkat pendidikan asas, masalah yang dihadapi khasnya dalam hal kewangan pendidikan adalah masih banyak sekolah yang kekurangan buku teks dan alat pengajaran, serta prasarana lainnya sehingga menyukarkan guru melaksanakan proses pembelajaran yang sesuai dengan keperluan pelajar. Hal ini dapat mempengaruhi profesionaliti seorang guru yang pada akhirnya akan memberi impak kepada kualiti pelajar. Tujuan kajian ini iaitu untuk mengetahui perspektif guru mengenai pembiayaan pendidikan. Diharap dengan mengetahui perspektif guru, dapat mengenal pasti serta memperbaiki perancangan RAPBS (rancangan anggaran biaya sekolah) di sekolah

METODOLOGI KAJIAN

Kajian ini menggunakan pendekatan kualitatif dan kuantitatif. Metode kuantitatif digunakan dengan menyebarkan soal selidik kepada sejumlah guru. Kemudian jawapan yang diperoleh ditulis dalam jadual kemudian dikira jumlah peratusan jawapan yang telah diberikan (Punch, 2009). wawancara mendalam dengan guru dijadikan bahan bagi analisis kualitatif (Creswell,1998).

Kajian ini dilaksanakan di 6 sekolah rendah di Bandar Makassar pada bulan Januari-April 2014. Pengkaji menyebarkan 65 soal selidik ke setiap guru di 6 sekolah berkenaan dan soal selidik yang kembali dan diisi hanya 53 soal selidik. Dan temubual mendalam dilakukan terhadap 6 orang guru yang berbeda dari sekolah yang sama. Jadi total responden adalah 59 orang. majoriti responden berumur 40-44 tahun (23%) dengan masa kerja. 20-24tahun (28%). Pendidikan terakhir responden umumnya S1 (79%) sedangkan majoriti responden adalah guru perempuan (83%). Sedangkan untuk pendidikan terakhir umumnya adalah S1 (79%).

Jadual 1 Data Responden Kuesioner

Deskripsi	% Total
Jenis Kelamin	
Laki-laki	17
Perempuan	83
Kelompok Umur (tahun)	
20-24	6
25-29	9,5
30-34	11
35-39	9,5
40-44	23
45-49	15
50-54	15
>55	11
Masa Kerja (tahun)	
<5	17
5-9	11
10-14	8

15-19	13
20-24	28
>25	23
Pendidikan terakhir	
SMA/SPG	8
DIII	4
S1	79
S2	4

PERBINCANGAN HASIL KAJIAN

Daripada jadual 2 terlihat bahawa masih terdapat (38%) guru SD di Kota Makassar yang tidak terlibat dalam perancangan pembiayaan di sekolah. Hal ini menunjukkan bahawa masih terdapat guru yang tidak dilibatkan dalam penyusunan anggaran pembiayaan di sekolah. Hal ini selari dengan terdapatnya (17%) guru yang tidak mengetahui masa penyusunan polisi pembiayaan operasional di sekolahnya. Dan sebanyak (70%) menjawab bahawa masa penyusunan polisi pembiayaan operasional sekolah adalah pada awal tahun. Kemudian (5%) yang menjawab penyusunan polisi pembiayaan di pertengahan tahun. Bahkan (7%) menjawab penyusunan polisi di akhir tahun. Hasil temubual yang diperoleh juga selari dengan hal diatas iatu:

“tidak pernah mengikuti mesuarat masalah pembiayaan di sekolah.”(TGSR6).

Selanjutnya dari jadual 2 terlihat bahawa amnya guru menjawab bahawa (53%) dana BOS dapat menanggung biaya operasional sekolah sebanyak 60-80%. Hal ini bererti bahawa dana yang diberikan kerajaan belum cukup untuk mendanai pembiayaan di sekolah. Hal berkenaan juga ditemukan dalam temubual dengan guru yang menyatakan bahawa:

“seringkali bajet pendidikan daripada jawatan pendidikan tidak cukup”(TGSRI).

Selari dengan hal berkenaan diatas, Toyamah dan Usman (2004)

menyatakan bahawa pada masa sentralisasi sampai desentralisasi halangan yang dihadapi dalam bidang pendidikan tidak jauh berbeza diantaranya masalah kurangnya kos operasi dan prasarana pendidikan.

Dan sebanyak (44%) guru menjawab bahawa dana yang di agihkan ke aktiviti proses pengajaran dan pembelajaran hanya 40-60% sahaja. Daripada hal berkenaan menunjukkan bahawa sekolah belum sepenuhnya menggunakan dana yang diberikan kerajaan bagi aktiviti proses pengajaran dan pembelajaran. Hal ini selari dengan kajian yang dilakukan oleh Deffous (2011) yang menyatakan bahawa terdapat pula masalah penggunaan kewangan yang tidak sepenuhnya diteliti tetapi lebih banyak kepada penggunaan perbaikan bangunan sekolah dan bukan untuk bahan pengajaran (Deffous, 2011).

Jadual 2 Data Amalan Pembiayaan Pendidikan di Sekolah

No	Deskripsi	% Total
1	Apakah anda dilibatkan dalam perancangan formulasi pembiayaan operasional sekolah (RAPBS) di sekolah Anda?	
	Ya	62
	Tidak	38
2	Bila masa penyusunan polisi pembiayaan operasional sekolah, di sekolah anda ?	
	Awal tahun	70
	Pertengahan tahun	5
	Akhir tahun	7
	Tidak pasti	17
3	Berapa peratus BOS telah dapat menanggung biaya operasional sekolah ?	
	<20	9
	20-40	12
	40-60	5
	60-80	53
	80-100	21
4	Berapa peratus BOS yang didistribusikan ke	

aktiviti proses pengajaran dan pembelajaran?	
<20	9
20-40	12
40-60	44
60-80	33
80-100	2

Daripada jadual 3 seramai (44%) responden menjawab kesesuaian dana BOS peritem yang ditentukan oleh kerajaan dengan keperluan yang sebenar di sekolah. Selanjutnya untuk soalan 6, responden menjawab (91%) guru tidak pernah mengikuti latihan dalam perancangan polisi pembiayaan operasional sekolah. Selari dengan hal berkenaan, daripada hasil temubual (TGSR1) menyatakan bahawa guru tidak pernah mengikuti sosialisasi ataupun pelatihan mengenai perancangan polisi pembiayaan.

Dan seterusnya, seramai (70%) responden menjawab bahawa pelajar di sekolah mereka menerima beasiswa dan sebaliknya 30% pelajar tidak menerima beasiswa. Dari pada hasil temubual (TGSR5) menyatakan bahawa tidak semua pelajar memperoleh beasiswa. Hal ini menunjukkan bahawa tidak meratanya sistem pendataan pelajar yang miskin di Bandar Makassar

No	Deskripsi	% Total
5	Bagaimana kesesuaian dana BOS peritem yang ditentukan oleh kerajaan dengan item keperluan yang sebenar di sekolah Anda ?	
	Sesuai	44
	Kurang sesuai	35
	Tidak sesuai	21
6	Apakah Anda pernah mengikuti latihan dalam perancangan polisi pembiayaan operasional sekolah?	
	Ya	9
	Tidak	91
7	Apakah di sekolah Anda menerima beasiswa?	

Ya	70
Tidak	30

Selain hasil temuan di atas terdapat pula beberapa temuan lain dari pada hasil temubual iaitu buku yang diberikan tidak mencukupi, lebih banyak Lembaran Kerja Pelajar (LKS), tetapi di sekolah tidak memerlukan LKS lagi (TGSR2) seterusnya (TGSR5) juga menyatakan bahawa buku pakej diagihkan semasa kanak-kanak di sekolah untuk dipelajari tetapi buku berkenaan tidak diberikan untuk dimiliki oleh pelajar kerana buku berkenaan tidak mencukupi untuk setiap pelajar. Selari dengan kajian Arfah (2012) yang juga mendapati kurangnya pengadaan buku pelajaran bagi pelajar, di salah satu sekolah rendah di makassar Hal ini bermakna bahawa kerajaan belum memenuhi Standar Pelayanan Minimal (SPM) untuk penyediaan buku pakej untuk setiap pelajar (P & K, 2013)

KESIMPULAN

Pembiayaan Pendidikan sangat penting terutama bagi pelajar miskin. Bagi mewujudkan wajib belajar pada tingkat pendidikan asas, maka kerajaan perlu melaksanakan polisi pembiayaan pendidikan secara telus, dan adil sehingga proses belajar mengajar dapat berjalan lancar dan seluruh kanak-kanak dapat memperoleh pendidikan.

Hasil kajian yang dilakukan di SDN di Bandar Makassar dimana 59 guru mengambil bahagian sebagai responden mendapatkan beberapa temuan penting antaranya iaitu masih banyaknya guru yang tidak dilibatkan dalam perancangan pembiayaan pendidikan di sekolah. Padahal untuk memudahkan penyusunan perancangan pembiayaan sepatutnya guru dilibatkan, kerana guru lebih mengetahui segala bahan yang akan diguna pakai dalam pembelajaran. Dan salah satu impak dari hal berkenaan adalah sebagian guru tidak mengetahui masa perancangan pembiayaan pendidikan di sekolah.

Amnya guru berpandangan bahawa dana BOS belum sepenuhnya dapat menanggulangi kos operasional sekolah. Hal ini bermakna bahawa kerajaan belum sepenuhnya membiayai kos operasional di sekolah. Apalagi kos operasional berkenaan hanya didistribusikan sekitar 40-60% bagi aktiviti pengajaran dan pembelajaran di sekolah.

Seterusnya bagi kesesuaian dana BOS peritem, Walaupun responden menjawab kesesuaian dana BOS peritem yang ditentukan oleh kerajaan dengan keperluan yang sebenar sebesar 44% tetapi jawapan kurang sesuai dan tidak sesuai lebih besar jika dijumlahkan (56%). Ini menunjukkan pihak sekolah tidak mengikuti aturan/ petunjuk penggunaan dana operasional yang telah diberikan oleh kerajaan.

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RAPPORT BUILDING IN QUALITATIVE RESEARCH

RohaizabintiZakaria & Aede Hatib bin Musta'amal

ABTRACT

Data collection in qualitative studies involves a lot of researcher-participant interaction and communication. A good rapport with the participant is vital and the good relationships will benefit the research in many ways. However many researchers had ignored the importance of building and maintaining rapport with the participants in data collection. Furthermore rapport building issues in qualitative research are often ignored in current literature (Leach, 2005). Hence the purpose of this paper is to enlighten readers about the importance of establishing a strong relationship with their participants. This article also provides useful strategies to build a good rapport with the participant in data collection by providing first hand experiences in data collection.

Keywords: Rapport Building, Qualitative Studies, Researcher-Participant Relationship

1.1 INTRODUCTION

Qualitative researches aim to gather an in-depth understanding of a central phenomenon. In order to have an in-depth understanding researchers go to the location of the study and have a direct contact with participants. It is important for qualitative researchers to get as close as possible to the participant's perspective (Denzin & Lincoln, 2000). They gain insights from participants that are complete strangers and study on an issue that

is unfamiliar to the researchers. As the main source of data, research participants play a vital role in qualitative studies.

Data collection in qualitative studies involves a lot of researchers – participant’s interaction and communication. Hence, good communication is important in qualitative studies (Bartkowiak, 2012). It will create a relationship or state of having trust and mutual responsiveness with others (Churches & Terry, 2007). Productive communication starts with trust and understanding. Without understanding and trust, people can be sceptical and suspicious (Molden, 2011). Thus, it may risk the information that the researcher collected. Participants might create stories or keep the significant information and probably will behave unnaturally. This could jeopardize and invalidate the research data.

Therefore it is crucial for researchers to have a good relationship with their participants. Building good interpersonal relations between researcher and participant is an important aspect that needs to be considered especially when a researcher engages in interviews and observations in order to generate rich data (Guillemin & Heggen, 2009).

In order to have a good relationship with participants, the researcher needs to establish a good rapport with them. The purpose of establishing rapport between researcher and participant is to both generate rich data while at the same time ensuring respect is maintained between researcher and participant (Guillemin & Heggen, 2009). By having a good rapport with participant, it may give better information and data access for the researcher due to the trust and understanding built as a result from the good relationship between both of them.

2.1 RAPPORT BUILDING

Rapport is an essential basis for successful communication. Once rapport is built successfully, trust and mutual respect will increase and communication will be more effective (Youell &

Youell, 2011). Both researcher and participant will have better understanding and trust with each other. When two people are having trust and understanding, communication will become more open and in-depth which will yield rich and meaningful data. And this will definitely benefit the study.

2.1.1 What is rapport?

Rapport is the ability to connect with others in a way that creates a climate of trust and understanding. It is also the ability to appreciate other's opinion, to understand and accept other's feelings (Knight, 2009). Meanwhile Youell and Youell (2011) equated rapport with being 'in sync' or being on the same 'wavelength' as the person whom we are talking to. It is the quality of harmony, recognition and mutual acceptance that exists between people when they are at ease with one another. In other words rapport is feeling at ease with someone or a group of people by having traits or things in common which make communication easier. It is a relationship marked by mutual understanding and trust.

Tannen (1991) described rapport as a way of establishing connections and negotiating relationships by displaying similarities and matching experiences. Meanwhile Reiman (2007) defined rapport as the sense of 'in tune' or 'click' with each other. However, it does not mean that we need to agree with someone but it does mean that you respond to them and give them the experience of feeling understood (Churches & Terry, 2007). There are also other terms used that incorporate similar underlying themes, including collaboration, reciprocity, parity, growth and therapeutic alliance as known in the health science and they are considered interchangeable (Leach, 2005).

Rapport can actually be recognized. There are signs of growing rapport when there is an increase in flow of conversation, disclosure of sensitive information, relaxed body language, increased eye contact and improvements in listening and responding (Leach, 2005). Having rapport makes everything much

easier. Communication also occurs easily and becomes more effective and smooth. However, if there is sign of resistance such as a long periods of silence, sudden withdrawal of conversation, lack of eye contact, brief responses and defensive body language; these are signs of lack of rapport (Leach, 2005). Personal relationships are easier to build when there is a closer connection and understanding between the persons involved. Rapport can be developed and nurtured in a certain ways.

2.1.2 How to build and maintain rapport?

Sometimes rapport happens naturally without having to try. However rapport can also be built and developed by finding common ground, developing a bond and being emphatic. Below are several ways on how rapport can be built and maintained, especially when meeting new people like research participants. There are several tips that will facilitate in reducing the tension between both parties. Start with small talk about light topics for ice breaking. Avoid asking direct questions during this phase. Inject some elements of humour in the conversation. It tends to reduce the tense.

Researchers supposed to have or at least nurtured a certain quality for themselves as a preparation in rapport building. Leach (2005) had listed qualities such as to be open minded, flexible, reassuring and supportive, friendly, genuine, warm, sincere, empowering, respectful, sensitive and empathetic in encouraging rapport. Researchers need to be in these states as prerequisites for rapport building. He also listed things to avoid like passing judgement, jargon and technical language and an authoritarian demeanour if researchers want to promote rapport in building a relationship with participants.

Besides that, Hull (2007) suggested active listening through verbal cues (hm-mm..yah..right..) and non-verbal encouragers like eye contact, nodding and leaning forward as vital in order to boost rapport building. These can be done during the ice breaking

session or during the interview or when having communication with the participants. Being attentive shows that the researcher has an interest on what the participants are trying to say or do and at the same time gives courage to them.

Researchers are also encouraged to anticipate the participant's needs and maintain consistent contact (Elliott & Martin, 2013). Do stay visible. They find that visibility is critical to make and maintain successful connection. Finding opportunities to talk and take time to listen to their concerns are also essential part of rapport building.

In general, people are gravitated towards other people that they consider similar to them. According to Molden (2011), rapport is based on a principle of successful influences - people like people who are like them. People having a rapport typically adopt the same posture, move and gesture in similar ways, adopt the same style and rhythm in movement, speech, sense of identity, values and even breathing pace (Knight, 2009). She recommends to pay attention on how the person communicates. Identify any significance about his or her behaviour, language and body language. Identify one significant behaviour or style and concentrate on it before you try to match the elements.

Thus, simply by being like them and showing sincere interest in them as a person encourage a good rapport. Excellent communicators are sensitive to the patterns of people they are communicating with (Churches & Terry, 2007). To be in the same wavelength, researchers must be sensitive with the participant's appearance, language they use and the way he or she talk. If possible, try to match with them. If participants like to dress casually hence researcher also needs to align his or her dress code. Researchers can match participants' appearance by dressing much like them rather than arriving in a business suit. Researchers can also match their body language by sitting like them and trying to harmonise with the participant's verbal pace and tone. **Make sure use words and body language that are aligned and both are non-threatening. Effective ways of creating rapport are by subtly matching both verbal and non-verbal communication**

pattern especially voice patterns, body language and eye contact by developing the genuine interest in the participant (Youell & Youell, 2011).

According to Churches and Terry (2007), there are three output channels that a person could pick up information from the other person which are body, voice and words. By paying attention to the output of these three channels, researchers can adapt to the behaviours and become more like the participants. Rapport is created with this process is called matching and mirroring (Bartkowiak, 2012; Churches & Terry, 2007). It builds trust and is the basis of effective communication.

Ädel (2011) suggested bonding in maintaining a good relationship with participants. This bonding strategy includes agreeing, aligning within-group, commiserating, complimenting, seeking agreement, make offering, encouragement, thanking, responding to thanks and chatting. Bonding is a mutual process and involves an interactive process. These strategies can be applied by researchers in the fieldwork too, to get attachment from the participants.

Eye contact is also crucial in demonstrating sincerity and establishing trust (Reiman, 2007). When a person can maintain an appropriate eye contact, it shows that the person is attentive, competent and powerful. When someone speaks, it is vital to listen to the person, always look at the person in the face, maintain eye contact, occasionally tilt the head to the side to indicate interest and nod at appropriate times. These are what Reiman (2007) referred to as listening with the whole body.

While researchers strive to build trust with the participants, it is important to note the research ethics too. Gordon (1987) points out that 'getting close' to research participants has to be balanced with 'maintaining distance' or establishing rapport while ensuring respect as suggested by Guillemin and Hegggen (2009). Paramount within qualitative research is a need to balance establishing rapport and developing rich relationships with participants while maintaining distance out of respect for participants' privacy or sensitive issues.

In any interaction, whenever the researcher encounters resistance, it is a sign of lack of rapport. Researchers need to make effort in establishing and maintaining rapport with participants to gain trust and understanding. Once trust and understanding is built, the research process will be in smooth conduct.

3.1 MY RESEARCH EXPERIENCES IN RAPPORT BUILDING

Researcher's studies required the researcher to follow and observe participants' designing process while they are engaged in sketching activities. Participants consist of Industrial Design students from two local technical higher education institutions. All participants' sketching activities were video recorded and observed by the researcher. The researcher has been following a total of four research participants. The researcher followed one participant's designing process at a time. Besides observation and video recording, the researcher also interviewed and documented participants' sketches too. A sketching journal has also been provided for participants to record their sketching sessions which was done without the presence of the researcher.

The duration of their sketching phase depends on the individual - between three to eight weeks. The researcher observed the participants for two to three hours each session, twice a week. Since the nature of a research requires a lot of effort and time to be spent in the fieldwork, the researcher has decided and learnt to have a very good rapport with the participants. In establishing rapport with a research participant, the researcher had strived to build trust to establish relationship that leads to the sharing of rich and insightful data.

The researcher met P1 during her pilot study. He was chosen by his course lecturer to be involved in the study. P1 is very quiet, obedient and a decent student. After some quick self-introduction and research objective briefing to the whole class, the researcher immediately started the observation and video recording

when P1 started his sketching, without having any personal interaction with the participant. The researcher still remembered how P1 was very stiff in his very first sketching session and even the whole class was very quiet for the whole three hours of sketching session with the presence of the researcher. At times the researcher saw him having a sidelong look at the researcher and the video camera. The researcher believed he cannot concentrate on his sketching at that moment. The researcher believed that the lack of personal interaction and communication had caused the difficulty in establishing a good relationship between the researcher and P1 during this first visit and the reaction from participant was so unnatural.

But after the second and third meetings, with more interactions and communications between the researcher and participant, the situation was getting less tensed day by day and P1 could finally sketch at ease. He was getting familiar with the research settings and the researcher had also gradually changed her roles and instead, approached the participant as a friend (or more precise, as a sister) rather than acting as a researcher. Then only after that P1 became more comfortable with the presence of the researcher and got used to it. The researcher also gave some snacks like sweets and chocolates to the participant to break the ice and he can even share them with the whole class.

From this pilot test, the researcher had learnt that breaking the ice is essential for initial meetings; do make some simple conversation with the participant. Let them know and familiarize with the researcher and clarify on how the data collection process will be conducted on the participant. This is to give participants a general idea on what he or she will be going through later. It is also to avoid the participant from becoming clueless and nervous during the sketching session due to improper guidelines given earlier. These are important because lack of rapport could jeopardize the data as there is a potential for participant to fake his or her behaviour. When this happens, the validity of the collected data could be doubted.

Researcher's second experience in qualitative data

collection was with P2. P2 was a very confident student, friendly and helpful. Same as P1, P2 had also been randomly selected by his lecturer. With the experience that the researcher gained from the prior data collection, the researcher was more prepared with this trip. The researcher and participant both had an ice-breaking and briefing session during the first visit. The researcher had introduced herself to P2 and got to know him better. Both of them had a small informal conversation about P2 background and at the same time the researcher also studied about his behaviour and interest. The researcher addressed herself as 'sis' and called P1 with his nickname to maintain the casual atmosphere. The researcher tried to adjust her language equivalent with the participant's talking style. During this ice breaking session, the researcher and participant can get along very well. The researcher also brought P2 sweets and chocolates to show that this research setting is not too formal. This is because a person will only react normal or becomes himself when he feels comfortable.

The researcher conducted a simple and precise briefing with the participant. P2 was very well informed that day and understood what he will be going through later. He also has a general idea on how the research data will be collected too. On this first meeting, the researcher had decided not to start any data collection yet except trying to blend and mingle around not only with the participant but also with the rest of the class. Participants will not only familiarize with the research setting, the researcher also tried to get used to the surroundings and learn how the design class will be conducted.

The researcher often reminded P2 to act naturally as if there is no one observing and no recording has been done. With the rapport that has been established since the first visit and the participant is also understood on the research expectation, the first observation and video recording session went very well. Even though at the initial stage, the researcher had sensed the participant's uneasy and discomfort feeling with the recording session but towards the later part, he looked more relaxed and at ease with presence of the video camera and got used to it. This

situation became very convincing day after day until he totally ignored the presence of the researcher and the video camera.

Even though the researcher acted as a non-participant observer, in some cases the researcher would interrupt the participants by asking about what is going on or if any problem arise during the design process. This is to show interest or empathy towards the participant and at the same time the researcher can keep track and understand what is happening. Of course the researcher will not suggest or comment about it to ensure that the researcher is not involved in the participants' project. With well-prepared planning and high sensitivity on the surroundings, the researcher managed to build a good rapport with P2 faster compared to P1.

The researcher followed P2 for about a month, at time the researcher can see he was exhausted due to the course workloads. He can no longer concentrate on his sketching and seem to have no interest to sketch. At that time the researcher will let P2 doing his other things or just relax during the class. Instead of forcing him to sketch, the researcher sat down together chatting with participant or just do the researcher's own work. This is just to give him some space after so many sketching and recordings that he had gone through. Such tolerance from the researcher could motivate him to keep continue being the research participant in this study.

As the nature of design which cannot run from creativity, the researcher does not want to obstruct P2's creative process while sketching. The researcher encouraged P2 to let loose during the recording sessions. He was allowed to have a conversation with his friends and he also had all control on his own sketching session where he can start and stop at any time he wants. There is no any restriction on the sketching sessions. The researcher followed P2's own time. Besides, in between the sessions, the researcher always had a small chat with the participant every time before he started his sketching session. This is one the ways to establish the bond between a researcher and a participant (Ädel, 2011).

Of course a good rapport could benefit the researcher in some way, but the researcher also needs to bear in mind that rapport building also requires a win-win situation. The reciprocity

relation needs to be developed in order to maintain the rapport between the researcher and the participant. In this case, the researcher understood well the life of a student especially a final year design student. The cost of drawing materials is not cheap. Thus the researcher decided to give P2 support in terms of providing his design materials. The researcher bought him rendering markers which he lacked of. The researcher also had brought him interior deco magazines for his references in his design project. Everytime the researcher visits P2 for data collection, the researcher never forgot to bring some snacks for him like sweets and chocolates. He can even share these snacks with the entire class. This could motivate him to continue participating in the study and make him excited to meet the researcher.

And these practices were continued and have been applied too in P3 and P4 data collections. The ice breaking, sensitivity on the participant's behaviour, matching with the participant style, maintaining the mutual respect, being flexible and tolerate and giving moral and material support will always be my practises in data collection. It is to ensure that the researcher can build rapport with participants faster in order to gain rich and meaningful data. These are among the important elements that qualitative researchers need to keep in mind before stepping into the fieldwork for data collection.

4.1 CONCLUSION

Building a relationship between the researcher and the participant is integral to all qualitative studies. The purpose of this paper is to enlighten readers of the importance of establishing a strong relationship with their participants, and to provide them with useful strategies to improve participant rapport in data collection. Rapport once secured must continuously maintain (Turgo, 2012) to established relationship that will lead to

the sharing of rich and insightful data and at the same time could reduce the Hawthorne Effect (Schwartz, Fischhoff, Krishnamurti, and Sowell (2013); (Yunker, 1993). The ice breaking session, the participant understanding on research objectives and method, sensitivity on participant's behaviour and reactions, tolerance, flexibility and motivation from the researcher are vital in building rapport with participants. Good rapport will foster respect and trust, and together, a mutual understanding can be achieved to provide quality research findings.

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METACOGNITIVE COMMUNITY INTO ASYNCHRONOUS TEXT- BASED ONLINE DISCUSSION TO INVESTIGATE THE PERFORMANCE OF HIGHER LEVEL THINKING SKILLS AMONG NOVICE TEACHERS

Huang Chwei Ing & Noraffandy Yahaya

ABSTRACT

Thinking is an essential skill in education, and especially in higher education institutions. Therefore, the purpose of this study was to investigate learners' performance on higher level thinking skills in an asynchronous text-based online discussion in a Collaborative Metacognitive Community. This model was developed under the umbrella of the socio-constructivist approach, in which learners are encouraged to become active learners. Later, message postings were extracted to determine the levels of thinking skills exhibited by the learners. Furthermore, data from learners' reflective journals and interviews were triangulated to get the big picture of learners' thinking skills. Results showed that learners' thinking skills can be enhanced through a Collaborative Metacognitive Community in asynchronous text-based online discussions.

Keywords: Asynchronous online discussion; higher education; thinking skills

INTRODUCTION

Nowadays, education particularly higher education is evolving within the classroom to online learning. One of the most significant changes is the range of interactions that occurs in the learning community. Interaction among instructors and learners varies from solely face-to-face to blended learning or even fully online interaction depending on learners' requirements. Furthermore, the learning process has evolved from a teacher-centred to a learner-centred approach where learners need to construct their understanding through discussion, analysis, assessment and integration, which involve higher level thinking skills. Similarly, the learners' role has shifted from passive to active, in that they take responsibility for their own knowledge construction in the learning experience. Research has been carried out to investigate how to innovate online didactics over traditional instructional models that best develop student learning (Biasutti & El-Deghaidy, 2012). All in all, learners tend to be cultivated towards greater independence and engagement in their learning process in order to construct a more meaningful educational experience.

A meaningful educational experience is a process through which learners can achieve the predetermined learning outcomes and become more knowledgeable. Recently, education has tended to focus on twenty-first century skills such as thinking skills, ways of working and tools for working as well as skills for living in the world (Oblinger & Oblinger, 2005; Sahin, 2009). Therefore, instructors are urged to be skill facilitators rather than merely delivering knowledge to the learners. However, researchers have argued that the implementation of higher level thinking skills in the classroom is problematic due to various unavoidable circumstances, including, amongst others, time, the quantity of students and the classroom setting (Nagappan, 2001; Niu et al., 2013; Vijayaratnam, 2012). After all, there are only few courses have been specially designed to conduct critical thinking, as most

of these skills are embedded and delivered in the subject matter (Nagappan, 2001). Consequently, under those circumstances, academicians have claimed that asynchronous text-based online discussion is not competent to shift the learners' thinking skills to higher levels such as integration and resolution (Akyol & Garrison, 2011; Akyol et al., 2011; Garrison & Kanuka, 2004). Nevertheless, Marin and Halpern (2011) asserted that explicit instruction is a more effective strategy to boost the level of thinking skills among learners. The research has demonstrated that whenever educators gave more concrete and explicit instruction in the learning process, it had greater positive results towards higher level thinking skills amongst learners.

Lately, asynchronous text-based online discussion is gaining attention in education. It enables the learning process to be done regardless of time and location. Furthermore, it allows learners to have more time to reflect, think, explore and interact with others and thus contribute to their own knowledge building (De Wever et al., 2006). This research aimed to explore how the designed model promoted higher level thinking skills in asynchronous text-based online discussion among novice teachers. Furthermore, it sought to discover how the novice teachers used the model to cultivate higher level thinking skills. Finally, this study sought to determine the level of thinking skills exhibited by the learners in their message postings. Data was collected and analyzed to determine the ways in which the model assisted the novice teachers to reach higher level thinking skills and to assess the level to which the novice teachers projected their thinking skills via asynchronous text-based online discussion.

1.1 MODEL'S BACKBONE - COMMUNITY OF INQUIRY

Community of Inquiry (CoI) first proposed by D. Randy Garrison et al. (1999) aligned with the socio-constructivist theory. It consists of three presences, namely cognitive presence, social

presence and teaching presence. These three presences are interdependent and are all required in order to provide a meaningful learning experience. It is also a model of cognition that operationalizes inquiry with the potential to contextualize and understand metacognition (Akyol & Garrison, 2011a). Altogether, it is claimed that the learning process happens within this community through the interaction of the three presences (Vaughan & Garrison, 2005). Furthermore, Garrison et al. (2001) claimed that Community of Inquiry is the hallmark of higher education, where there is a need to focus on the development of higher level thinking skills in text-based medium.

Initially, cognitive presence was employed through the Practical Inquiry Model, which consists of four phases: triggering event, exploration, integration and resolution. At the triggering event, the learner's curiosity is piqued and a problem is posed to attract the learner. Then, in the exploration phase, learners explore the possibilities and solutions to the assignment. By the end of this stage, learners are equipped with the information searching skills needed for sorting and filtering of information related to the assignment. The third level is integration, where new information is combined with the existing knowledge to construct new ideas. This level involves active contribution from numerous learners, such as argumentation, discussion, negotiation and reflection, until the knowledge construction is complete. Finally, knowledge constructed in integration is applied at the resolution level to solve the problem assigned at the triggering event phase. In conclusion, learners are urged to go through all the four phases in the cognitive presence model in order to achieve a successful outcome.

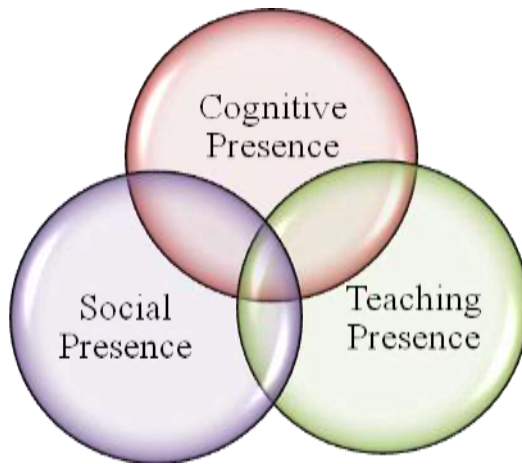


Figure 1: Community of Inquiry

In order for this process to yield a successful outcome, instructors as well as learners must be given the responsibilities to lead and maintain the dynamic community (Vaughan & Garrison, 2005). They further asserted that teaching presence is included in CoI in sustaining the learning process through design, facilitation and direct instructional responsibilities. Without teaching presence, asynchronous online learning could end up with high levels of interaction but low levels of cognitive exchange.

Nevertheless, interaction is crucial to maintain the sustainability of the learning community. Garrison et al. (1999) defined social presence as the ability of participants in a community of inquiry to project themselves socially and emotionally, as “real” people. Similarly, Dawson (2006) and Sadera et al. (2009) supported that learners who showed higher connectedness to the community perform better in the learning. Rovai (2002) emphasized the importance of attracting adult learners to engage in the learning community rather than retain them. This was supported by Meyer (2003), who argued that social presence is a positive predictors of learners’ learning and course satisfaction in online communities. This presence is essential to nurture the sense of belongings of the learners in the community to gain the knowledge collaboratively

1.2 TWO VALUE ADDED APPROACHES: COLLABORATIVE KNOWLEDGE BUILDING AND METACOGNITIVE SCAFFOLDING

Learning appears to be most effective when learners are actively involved in creating or building knowledge (Dvorak, 2011). In fact, knowledge is constructed when a learner is engaging and participating in activities in a designed learning community. Furthermore, Schrire (2006) found that synergistic interaction among the learning community is beneficial in that it encourages deeper knowledge construction. In addition, Lowyck & Pöysä (2001) endorsed that collaboration yields great impact on quality in learning, especially in higher education. Hence, collaborative knowledge building not only sustains the learner's engagement in learning but also provides a path for learners to become more knowledgeable through their learning experience.

Similarly, learners become knowledgeable when they play an active role during the learning process, searching, discussing, negotiating, provoking and engaging in other collaborative activities in order to construct knowledge. In order to cultivate higher level thinking skills among the learners, the role of instructors is to facilitate and let the natural process unfold with little procedural influence (Shepherd, 2005). This scaffolding enables the learner to become more knowledgeable and more independent during their knowledge building. Meanwhile, collaboration is treated as a crucial element to enhance the scaffolding process as learners are required to interact actively during the process with other learners. With the aid of scaffolding, learners are able to project their higher level thinking skills in discussion (Dougiamas & Taylor, 2003). Moreover, Molenaar et al. (2010) claimed that learners with the aid of scaffolding performed more metacognitive activities even though the scaffolding was fading. All in all, the study aimed to inject both collaborative knowledge building and metacognitive scaffolding

into the learners' educational process which can enhance higher level thinking skills in their asynchronous online discussions.

Furthermore, this research is hoping to benefit the learners in knowledge building through socio-constructivist model. At the same time, the educators are giving insights in designing activities related with asynchronous text-based online learning as well as guidelines on how to evaluate the level of thinking among the learners in asynchronous messages postings. Finally, this research will fill the gap and contribute to the development of learning model and teaching strategy in asynchronous text-based online learning in higher education.

2.0 METHODOLOGY

In this study, qualitative approach is used to have an inclusive insight on the research problem. The study collected data from the message postings from the learners throughout the 15 weeks of learning experience.

2.1 PARTICIPANTS

The participants were twenty-one second year novice teachers who had registered for a compulsory educational technology subject. Each of the participants were given a code to ensure their anonymity (Creswell, 2008). Furthermore, participants were given the consent form to sign and they were informed that this research will not put them at any risk.

The context of this research was an asynchronous text-based online discussion in a learning management system. The course was designed and developed by applying the strategies identified by the CoI theoretical framework, which aims to develop social, teaching and cognitive presence. For example, in order to develop effective teaching presence, students shared the role and responsibility of the course instructor by leading the online

discussions. There were fifteen weeks of online discussions and the final project involved producing a teaching media package. The first, fifth, twelfth and fourteenth weeks of online discussion were chosen to determine the level of thinking skills projected by the participants in the asynchronous text-based online discussion. Initially, the instructor would code the message segments together with an assistant to ensure inter-rater reliability. Message segments would be highlighted using four different colours to determine the levels of thinking skills. The coders met after the first coding had been completed to discuss the results. When both coders were satisfied with the coding scheme, they would then proceed to code the remaining message postings using the coding schema agreed by both of them. In order to mitigate bias, the researcher also used reflective journals to triangulate the data. Lastly, a checklist is developed based on the thinking skills indicators from (Shea et al. (2010)). It was used to categorise the participants' learning trends into different groups based on the findings from content analysis, interview and reflective journal.

2.2 THE RESEARCH CONTEXT

The research took place in a teacher education institute which offered undergraduate courses for novice teachers. This curriculum was designed at the headquarters teacher education institute and later distributed to multiple teacher education institutions nationwide for implementation. Data was obtained from asynchronous text-based online discussion message postings. To better understand the data, contents from the first, fourth, twelfth and fourteenth weeks were extracted and coded. However, the instructor's messages were excluded from the content analysis. The participants were also required to submit reflective journals on a weekly basis to better understand the research.

3.0 RESULTS

The message postings were extracted from the asynchronous text-based online discussion for the first, fifth, twelfth and fourteenth weeks of the project. The instructor's message postings were filtered and excluded from the analysis. For this research, units of analysis to be analyzed were the segment of the message postings. Below are examples of message segments exhibiting different levels of thinking skills among the participants in the asynchronous text-based online discussion.

Table 1: Message posting's excerpts extracted from asynchronous online discussion

Thinking skills	Indicators	Message excerpts	Posting
Triggering Event	Sense of puzzlement	Can you tell us how it works?	
	Recognize problem	Teacher did not use a variety method...	
	Framing the issue	Can we do it for this time??	
	Probe question	May I ask you, is that teacher already teaching for many years or just a newbie teacher?	
Exploration	Information exchange	I think...	
	Redefine the issue in their own word	student feel comfortable...	
	Brainstorming	...think that scenario shouldn't be occur.	
	Information searching	can't detect at time...	
	Discussion	class management could be easy...	
	Collaboration	show us the	

		strength...
	Suggestions	Why don't we use positive reinforce such as giving them
	Leaps to conclusion	I agree with you...
	Focus and emphasize on the issue	learners are not interested
Integration	Connection of ideas	in my opinion,...
	Synthesis idea	patch it on the blackboard...
	Combining new ideas	also can make a game...
	Construct solutions	can do quiz and give them present...
	Applying technical skills	involve student-centred learning...
	Using a variety of media	use 2D,3D and video...
	Integrating information and communication technology	using power point...
	Making decision	using word that provided...
Resolution	Applying new ideas	put in the box with 6 backgrounds...
	Defining solution	explain the contents...
	Simplifying the procedure framework	teacher explain...
	Producing a variety of teaching media that is appropriate for subject contents	...nice and beautiful car
	Evaluating the effectiveness of the	Ease of use...

usage of teaching media	
Peer assessment	look beautiful and attractive
Portfolio developing	connect the answer with their experiences
Reflection	students can enjoy their study

The total message postings for these four weeks numbered up to six hundred segments. For the first week, the message postings consisted of 28% triggering event postings and 72% cases of exploration. From the research, the low percentage of triggering event messages in the asynchronous text-based online discussion were found as the learners were having face-to-face interaction with the instructor. Apparently, this interaction opened up the opportunity for the learners to seek clarification directly from the instructor. Furthermore, the design of the learning management system was underpinned by the CoI where learning outcomes, assignment requirements and due dates were clearly stated. Therefore, it allowed learners to have more time to explore and reach conclusions. During the fifth week, 31% of the message posting segments were categorised as triggering events, while 69% were exploration. There was no sign of message postings showing higher level thinking skills in this particular week. At week twelve, 8% of these segments were categorised as triggering events, 16% were as exploration and 76% as integration. Finally, at week fourteen, the researcher recorded 305 message postings segments, of which 3% were labelled as triggering events, 7% as exploration and 3% as integration. The remaining 87% of the message postings were classified as being at the level of resolution.

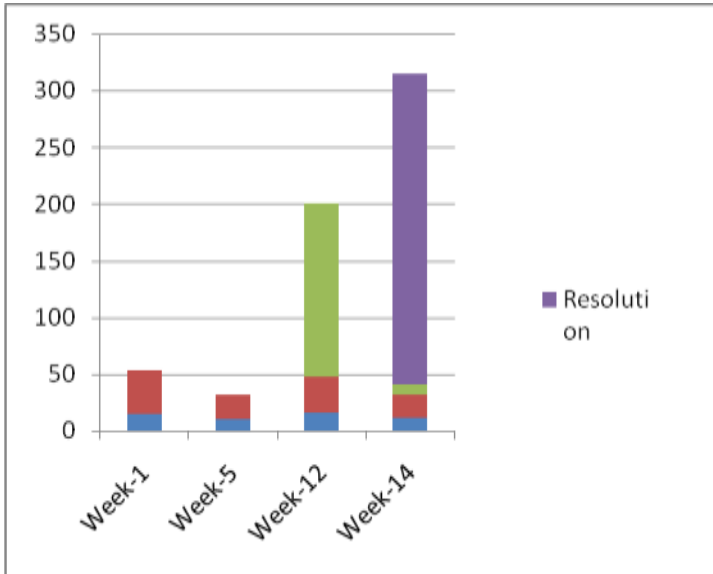


Figure 2: Message postings exhibited four levels of thinking skills in Asynchronous Online Discussion

Table 3: Higher Level Thinking Skills Checklist

Item Participant	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14	I15	I16
1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	*	*	*	*	*	X	*	*	*	*	X	*	*	*	*	*
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5	*	*	*	X	*	*	*	X	X	X	*	X	X	*	*	
6	*	*	*	X	X	*	*	X	X	*	*	X	X	*	*	
7	X	X	X	X	X	*	*	X	X	*	X	*	X	X	*	*
8	*	X	X	X	*	*	*	*	*	X	X	*	X	X	X	X
9	X	X	*	X	X	*	*	X	*	X	X	*	X	X	X	X
10	X	X	*	X	X	*	*	X	*	X	*	X	X	X	X	X
11	X	X	X	X	X	*	*	X	*	X	*	X	X	*	*	X
12	X	X	X	X	X	*	*	X	X	X	X	*	X	X	*	X
13	X	X	*	X	X	*	*	X	X	X	*	X	X	*	X	X
14	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
16	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
17	X	X	X	X	X	*	X	X	X	X	*	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	*	X	X	X	*	*
19	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
20	X	X	X	X	X	X	X	X	X	X	*	X	X	X	X	X
21	X	X	X	X	X	X	X	X	X	X	*	X	*	X	X	X

Researcher adapted the thinking skills' indicators from Shea et al. (2010) and developed the checklist to gather and triangulate the data from message postings, interview as well as reflective journal. This data triangulation checklist contained sixteen items that assessed learners' higher level thinking skills during the asynchronous online text-based discussion. It showed that participants 1, 2 and 3 had mastered the skills required to enable them to project higher level thinking skills in their message postings. Participants 5 to 13 had obtained five or more criteria from the checklist. The remaining participants had attained less than two criteria from the checklist. Thus, the checklist revealed that the learners could be categorised into three groups based on their performance toward projecting higher level thinking skills in their asynchronous text-based online discussion.

4.0 DISCUSSION

In this study, the developed model had indeed enhanced the learners' higher level thinking skills in asynchronous text-based online learning. Moreover, the learners' participation trend can be

identified and classified into three different group namely proactive, progressive and partisan learner.

Proactive learners initiated and created their own learning experience. They tended to be very clear about their learning objectives and the time frame for each activity throughout the semester. Furthermore, they not only engaged actively in the asynchronous text-based online discussion, but were dedicated to productive discussion, which yielded achievement of the predetermined learning outcomes. These learners were keen to search for and explore new concepts. They did not hesitate to ask for clarification whenever they encountered obstacles. They had a sense of leadership and were able to establish a sense of community among the learners. Nevertheless, they remained focused on the learning activities in a way that helped them to learn. Unsurprisingly, they were the ones who were most active in the asynchronous text-based online discussion and provided feedback in timely fashion.

Since they were active in knowledge building, they always showed curiosity towards the learning activities. Thus, they were the ones who recognized the problem and framed the issue in the asynchronous text-based online discussion. Moreover, they would puzzle and ask probing questions. On the other hand, they would also show interest in course issues discussed in the asynchronous text-based online discussion. No doubt, proactive learners were engaged actively in the discussion. They exchanged information, gave suggestions and were able to leap to conclusions in order to accomplish the task. As for information searching, they were able to integrate various types of information source. Furthermore, they focused on the assignment issue and were willing to discuss it with others, which helped them to appreciate different perspectives. In other words, they were open to various sources of information during their information searching. However, they were able to filter and assess the sources and thus construct their knowledge and reach conclusions.

Proactive learners were able to construct knowledge through connecting and synthesising ideas. In order to better

understand the issue at hand, they always combined new ideas, which helped them to construct solutions in order to solve the problem. Thus, they would explain the solution in their own words and master the knowledge they created. Besides, proactive learners were more likely to integrate information and communication technology during their knowledge construction. They adapted to the technology and hence implemented it during their learning experience. They were always the leaders of their groups and were able to make decisions and simplify the procedural framework. Moreover, they were able to produce a variety of teaching media that were appropriate for the subject content and at the same time assess the effectiveness of their peers' work. Another element that distinguishes them from the other participants was that they were able to reflect on the learning, which helped them to understand its fundamental concepts. Additionally, this group of learners were able to apply the knowledge created in this course to their work or other non-class related activities.

The progressive group of learners were aware of their learning goals and of the course topics. They actively participated in the course learning activities. Similarly, their participation in the AOD was progressive and contributed to productive dialogue. In this study, the progressive learners had a sense of community among the participants. This was a vital element to ensure that the learners would sustain and engage in the learning community.

However, they were unaware of the important due dates for the learning activities. This happened because some of the learners took longer than others to familiarize themselves with the learning system. In addition, some of them were fond of exploring new concepts and trying to find alternatives in order to complete the given task. Hence, these learners focused on the issue in a way that helped them to achieve their learning outcomes. Meanwhile, others in the group showed no sign of this behaviour. Participants in this group occasionally failed to provide feedback.

The follower group showed limited leadership character throughout the learning process. Nevertheless, three of them were still able to develop the sense of community among the

participants. Based on the researcher's observation, these learners were passive during the learning process. Nevertheless, they still contributed to the message postings which projected higher level thinking skills.

5.0 CONCLUSION

This research investigated learners' higher level thinking skills as projected in asynchronous text-based online discussion. Research revealed that the designed model is able to enhance the learners' higher level thinking skills as evidenced in their message postings. Furthermore, the results revealed that integration of the designed model into the asynchronous text-based online discussion allows learners to project higher level thinking skills in the learning process. The model gave insights on how the instructors can design and create the environment to enhance the learner's higher level thinking skill in asynchronous text-based online discussion. Furthermore, the model can assist instructor with similar course goals to integrate asynchronous text-based online discussion into the classroom. In addition, analysis of the data revealed that there are three types of learner: proactive learners, progressive learners and followers. Although these learners actively contributed to the asynchronous text-based online discussion, they commented in the interview that there were many obstacles to be resolved. Perhaps in future research, some infrastructure support, process regulation and learning experience should be upgraded to support this socio-constructivist learning process in the asynchronous text-based online discussion.

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PENINGKATAN KOMPETENSI PROFESIONAL TEKNOLOGI PENDIDIKAN

Eldarni & Zaleha Abdullah

ABSTRAK

Tujuan pendidikan nasional dirumuskan untuk mengembangkan potensi peserta didik agar menjadi manusia yang beriman dan bertakwa kepada Tuhan Yang Maha Esa, berakhlak mulia, sehat, berilmu, cakap, kreatif, mandiri dan menjadi warga Negara yang demokratis serta bertanggungjawab (UU No 20 tahun 2003). Kehidupan bangsa yang bijak merupakan cita-cita luhur bangsa Indonesia. Untuk tercapainya cita-cita. Dengan makin berkembangnya pengetahuan dan teknologi serta bertambahnya tuntutan masyarakat baik dari dalam maupun mancanegara akan kualiti perkhidmatan khususnya dalam bidang teknologi maklumat dan komunikasi, maka perlu adanya peningkatan sumber daya manusia yang kompeten di bidang teknologi pendidikan. Peraturan Menteri Negara Pendayagunaan Aparatur Negara (MENPAN) Nombor: PER / 2 / M.PAN / 3/2009 tentang Jabatan Fungsional Pengembang Teknologi Pembelajaran dan Angka Kreditnya, bertarikh 10 Mac 2009. Terbitnya PP ini adalah angin segar dan bukti keseriusan kerajaan untuk terus menggiatkan teknologi pembelajaran ini. Association for Educational Communications Technology (AECT) pada tahun 1994 memberikan definisi teknologi pendidikan atau teknologi pembelajaran sebagai berikut: "Teknologi pembelajaran adalah teori dan amalan dalam reka bentuk, pembangunan, penggunaan serta penilaian proses dan sumber untuk belajar". Jadi semua perkara yang berkaitan dengan definisi di atas adalah ruang lingkup kerja dalam teknologi pembelajaran. Makalah ini akan cuba menghuraikan tentang bagaimana mempersiapkan tenaga pemaju teknologi pembelajaran

yang profesional. Kompetensi S1 Teknologi Pendidikan ditujukan untuk penguasaan kemampuan: a) Memahami landasan teori / penyelidikan dan aplikasi teknologi pendidikan, b) Merancang pola pengajaran, c) Menghasilkan media pendidikan, d) Menilai program dan produk instruksional, e) Menguruskan Media dan cara belajar, f) Menggunakan cara, media, dan teknik pengajaran, g) Menyebarkan maklumat dan produk teknologi pendidikan, h) beroperasi sendiri dan melatih orang lain dalam mengendalikan peralatan audiovisual. Kompetensi Paling utama adalah: 1) Mampu merekabentuk proses pembelajaran sesuai dengan ciri-ciri peserta belajar, 2) mampu membangunkan program pembelajaran, 3) mampu menggunakan dan menyebarkan inovasi Teknologi Pendidikan, 4) mampu menilai dan meneliti proses pembelajaran. Sedangkan Kompetensi Pendukungnya adalah: 1) Mampu mewujudkan usaha bidang Teknologi Pendidikan, penyiaran dan maklumat, 2) Mampu memberikan perkhidmatan teknikal penggunaan dan pembangunan sumber belajar di institusi pendidikan dan maklumat, 3) Mampu membangunkan program pendidikan dilembaga penyiaran dan maklumat, 4) Mampu menyiapkan tenaga pengajar bidang Teknologi Pendidikan. Menurut Barbara B. Seels, dan Rita C. Richey (1994) teknologi pendidikan dirumuskan dengan berlandaskan lima bidang garapangan iaitu: Design, Pembangunan, Penggunaan, Pengurusan, dan Penilaian. Sedangkan menurut Miarso (2011: 201) kawasan teknologi pendidikan meliputi Design, Pembangunan, Penggunaan, Pengurusan, Penilaian dan penelitian. Upaya peningkatan kompetensi memperbaiki dalam proses perkuliahan, latihan bidang kajian teknologi pendidikan, dan meneruskan pendidikan ke jenjang yang lebih tinggi.

A. Pembahasan

1. Kompetensi Profesional Teknologi Pendidikan
 Teknologi pembelajaran merupakan suatu jabatan profesional. Sebagai jabatan profesional kewujudan profesi TP disokong adanya kod etika, pendidikan dan latihan yang mencukupi, serta

pengabdian yang terus menerus. Kode etik profesi mempunyai tujuan melindungi dan memperjuangkan kepentingan peserta didik; melindungi kepentingan masyarakat, bangsa dan negara; melindungi dan membina diri serta sejawat profesi; dan membangunkan kawasan dan bidang kajian teknologi pendidikan. Selain itu, kewujudan sebuah profesi juga ditunjukkan dengan adanya sijil. Secara umum sijil diertikan sebagai tanda bukti penguasaan suatu kompetensi dalam bidang profesion tertentu yang dikeluarkan oleh instansi berkuasa. Peraturan Pemerintah No. 23 Tahun 2004 tentang Badan Nasional Sertifikasi Profesi, pada Bab I, pasal 1, ayat 1 berhubung dengan perakuan kompetensi kerja menyatakan bahawa Sertifikasi kompetensi kerja adalah proses pemberian sijil kompetensi yang dilakukan secara sistematik dan objektif melalui uji kompetensi yang merujuk kepada standard kompetensi kerja nasional Indonesia dan / atau antarabangsa. Dengan adanya sijil ini, para teknolog pendidikan dianggap telah kompeten untuk melaksanakan kerja-kerja yang berkaitan dengan pembangunan kurikulum dan teknologi pendidikan / pembelajaran.

Profesi berasal dari bahasa latin "Proffesio" yang mempunyai dua pengertian yaitu janji / ikrar dan pekerjaan. Bila artinya dibuat dalam pengertian yang lebih luas menjadi kegiatan "apa saja" dan "siapa saja" untuk memperoleh nafkah yang dilakukan dengan suatu keahlian tertentu. Sedangkan dalam arti sempit profesi bermakna aktiviti yang dijalankan berdasarkan kepakaran tertentu dan sekaligus dituntut dari padanya pelaksanaan norma-norma sosial dengan baik. Pada hakikatnya profesi merupakan suatu pernyataan atau suatu janji terbuka [to profess artinya menyatakan], yang menyatakan bahawa seseorang itu mengabdikan dirinya pada suatu jabatan atau perkhidmatan kerana orang tersebut merasa terpanggil untuk menjabat pekerjaan itu. Profesi adalah suatu pernyataan atau suatu janji yang terbuka. Suatu profesi mengandungi unsur pengabdian (Oemar Hamalik, 1984: 3) menurutnya, suatu profesi bukanlah bertujuan untuk mencari keuntungan materi belaka, melainkan untuk pengabdian kepada masyarakat. Pengabdian seorang profesional menunjuk

pada pengutamakan kepentingan orang banyak daripada kepentingan diri sendiri.

Suatu pekerjaan disebut profesi, apabila memenuhi ciri-ciri tertentu, Ciri-ciri profesion secara umum adalah: 1) Sebuah profesi mensyaratkan latihan menyeluruh sebelum memasuki sebuah profesi, 2) Latihan tersebut meliputi komponen intelektual yang signifikan, 3) Tenaga yang terlatih mampu memberikan perkhidmatan yang penting kepada masyarakat. Berikut ciri-ciri profesion menurut Hoyle, (1980) merumuskan tentang cirri-ciri pokok suatu profesi, iaitu: 1) Fungsi kepentingan social, suatu profesi merupakan suatu pekerjaan yang mempunyai fungsi dan kepentingan social yang besar, 2) Kemahiran, untuk mewujudkan fungsi ini dituntut darjah kemahiran tertentu, 3) Proses pemrolean kemahiran tersebut bukan hanya di lakukan secara rutin, melainkan sifat pemecahan masalah atau pengendalian situasi krisis yang menuntut pemecahan, 4) Batang tubuh ilmu, suatu profesi di dasarkan pada suatu disiplin ilmu yang jelas, sistematik, dan jelas (a systematic body knowledge) dan bukan hanya common sence, 5) masa pendidikan, usaha mempelajari dan menguasai batang tubuh ilmu dan kemahiran-kemahiran tersebut memerlukan masa latihan yang lama dan panjang, 6) Sosialisasi nilai-nilai professional, proses pendidikan tersebut juga merupakan wahana unuk sosialisasi nilai-nilai professional di kalangan para pelajar / mahasiswa, 7) Kod Etika, dalam memberikan perkhidmatan kepada pelanggan, seorang professional berpegang teguh kepada kod etika yang pelaksanaannya di control oleh organisasi profesi, 8) Kebebasan untuk memberikan judgment-nya, ahli suatu profesion mempunyai kebebasan untuk menetapkan judgment-nya sendiri dalam menghadapi atau menyelesaikan sesuatu dalam lingkungan kerjanya, 9) Tanggung jawab professional dan autonomi, komitmen suatu profesi adalah pelanggan dan masyarakat, 10) Sebagai ganjaran dari pendidikan dan latihan yang lama, komitmen dan seluruh perkhidmatan yang di berikan kepada pelanggan, maka seseorang professional mempunyai prestij yang tinggi di mata masyarakat dan ganjaran yang lain.

Lebih lanjut Miarso mengemukakan bahawa ciri utama dalam

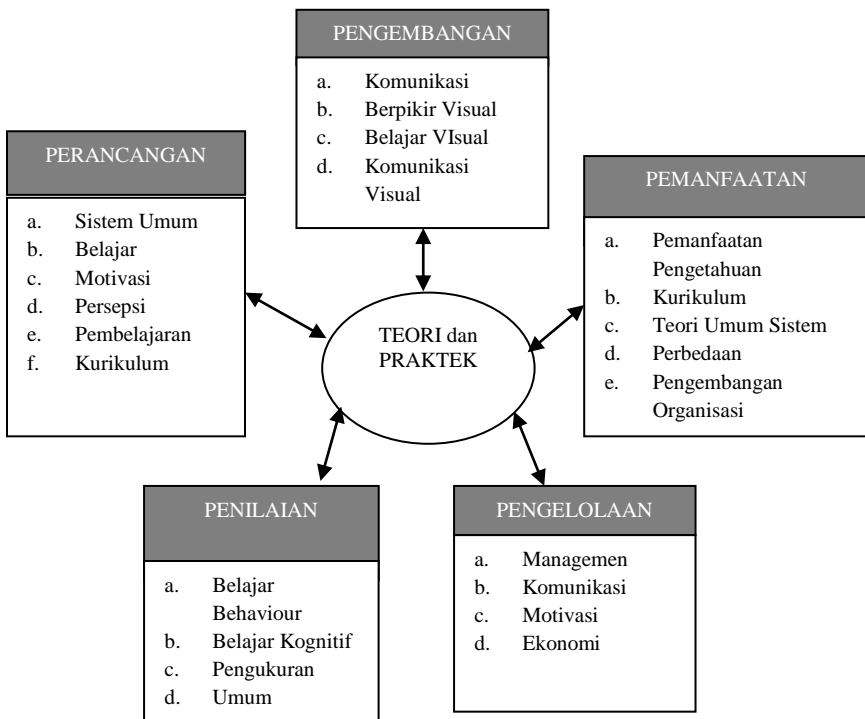
profesi teknologi pendidikan adalah adanya kod etika, pendidikan dan latihan yang mencukupi, serta pengabdian yang terus menerus. Kode etik profesi sebetulnya mempunyai tujuan melindungi dan memperjuangkan kepentingan peserta didik; melindungi kepentingan masyarakat, bangsa dan negara; melindungi dan membina diri serta sejawat profesi; dan membangunkan kawasan dan bidang kajian teknologi pendidikan (Kusuma, 2008: 7). Pendidikan dan latihan bertujuan untuk memberikan pembelajaran mengenai teknologi pendidikan kepada pelajar atau mereka yang telah menyelesaikan kajian mereka di Program Pengajian Pendidikan. Dengan cara ini mereka akan dapat bekerja lebih profesional. Sedangkan pengabdian yang terus menerus merupakan bentuk karya nyata dari seorang yang berprofesi teknologi pendidikan dalam membelajarkan peserta didik melalui layanannya seperti kemudahan dan sumber belajar. Finn (1953) dalam Kufiman (2008: 2) mengemukakan ciri-ciri profesion adalah: a) Suatu teknik intelektual, b) Aplikasi teknik tersebut yang berkaitan dengan urusan praktikal manusia, c) Latihan dengan tempoh masa yang lama, d) Suatu perkumpulan ahli profesion yang tergabung dalam sebuah badan dengan suatu komunikasi bermutu tinggi agar ahli-ahlinya, e) Satu rangkaian pernyataan kod etika dan standard yang disepakati, f) Pembangunan teori intelektual dengan kajian yang teratur.

Syarat-Syarat Profesion: a) Jabatan yang melibatkan kegiatan intelektual. b) Jabatan yang menggeluti suatu batang tubuh ilmu yang khusus, c) jabatan yang memerlukan persiapan profesional yang lama (dibandingkan dengan pekerjaan yang memerlukan latihan umum belaka), d) Jabatan yang memerlukan latihan dalam jabatan yang berkesinambungan, e) Jabatan yang menjanjikan kerjaya hidup dan keahlian yang kekal. f) Jabatan yang menentukan baku (piawai) sendiri, g) Jabatan yang lebih mementingkan perkhidmatan di atas keuntungan peribadi, h) Jabatan yang mempunyai organisasi profesional yang kuat dan terjalin erat.

Berdasarkan konsep teknologi pendidikan tugas pokok ahli teknologi pendidikan itu dikategorikan sebagai berikut: a)

Menyebarkan konsep dan aplikasi teknologi pendidikan terutama untuk mengatasi masalah belajar dimana saja, b) Merancang sistem dan program pengajaran, c) Menghasilkan media pendidikan, d) Memilih dan memanfaatkan pelbagai sumber belajar, e) Menilai produk, program dan sistem pengajaran, f) Menyadari perkembangan teknologi dan kesannya dalam pendidikan, g) Menguruskan organisasi dan personel yang melaksanakan aktiviti pembangunan dan penggunaan teknologi pendidikan, h) Merancang, melaksanakan dan menafsirkan kajian dalam bidangnya dan dalam bidang lain yang berkaitan dengan teknologi pendidikan.

BAGAN 1.1 Hubungan Antara Platform Teori Teknologi Pembelajaran dengan Masing-Masing Ranah



a. Perancang (Pereka)

Tugas ini meliputi mereka bentuk sistem pembelajaran, reka bentuk mesej, strategi pembelajaran, dan ciri-ciri pebelajar. Reka bentuk sistem pembelajaran adalah prosedur yang teratur yang meliputi langkah-langkah penganalisaan, perancangan, pembangunan, pengaplikasian dan penilaian pembelajaran. Reka bentuk mesej adalah perancangan untuk merekayasa bentuk fizikal dari mesej. Strategi pembelajaran adalah spesifikasi untuk menyeleksi serta menyusun peristiwa belajar atau aktiviti pembelajaran dalam suatu pelajaran. Ciri-ciri pebelajar adalah segi-segi latar belakang pengalaman pebelajar yang berpengaruh terhadap keberkesanan proses belajarnya (Seels dan Richey, 1994: 30).

b. Pembangunan (Developer)

Tugas ini meliputi pengeluaran dan penyampaian teknologi cetak, teknologi audio visual, teknologi berasaskan komputer dan teknologi bersepadu. Contoh teknologi cetak adalah buku-buku, bahan-bahan visual yang statik atau fotografis. Teknologi cetak ini ada dua jenis iaitu teks lisan dan bahan visual. Teknologi audio visual adalah teknologi yang berkaitan dengan mekanik dan elektrik. Audio visual adalah gabungan dari audio (dengar) dan visual (lihat). Ada kemungkinan alat tersebut hanya audio sahaja dan ada pula kemungkinan audio visual. Sedangkan visual saja termasuk ke dalam teknologi cetak. Teknologi berasaskan komputer adalah teknologi yang memanfaatkan komputer baik perisian dan peranti keras. Perisian berupa program-program komputer yang boleh memaparkan tayangan-tayangan pembelajaran. Sedangkan peranti keras dapat berupa skrin monitor, CPU, LCD. In focus, dan sebagainya. Dalam perkembangannya komputer merupakan alat untuk memaparkan internet, e-mel, dan sebagainya. Teknologi bersepadu adalah gabungan beberapa jenis media yang dikawal oleh komputer. Sebagai contohnya adalah video, filem, telekomprens, dan sebagainya (Seels dan Richey, 1994: 30).

c. Pemanfaat/Pengguna (User)

Tugas ini meliputi penggunaan media, difusi inovasi, pelaksanaan

dan pelebagaan, dan dasar / peraturan. Penggunaan media merupakan penggunaan yang sistematis dari sumber untuk belajar. Difusi inovasi adalah proses berkomunikasi melalui strategi yang terancang dengan tujuan untuk diterima pakai. Pelaksanaan adalah penggunaan bahan dan strategi pembelajaran dalam keadaan yang sesungguhnya (bukan tersimulasikan), sedangkan pelebagaan adalah penggunaan yang rutin dan pemeliharaan dari inovasi pembelajaran dalam suatu struktur atau budaya organisasi (Seels dan Richey, 1994: 30).

d. Pengelolan (Manager)

Tugas ini meliputi pengurus projek, pengurus sumber, pengelola sistem penyampaian, dan pengelola maklumat. Pengelola projek meliputi merancang, memantau dan mengendalikan projek reka bentuk dan pembangunan. Pengelola sumber meliputi merancang, memantau, dan mengawal penyokong dan perkhidmatan sumber. Pengelola sistem penyampaian merupakan kegiatan merancang, memantau, dan mengawal "cara bagaimana pengedaran bahan pembelajaran disusun". Sedangkan pengelola maklumat adalah merancang, memantau dan mengawal cara penyimpanan, penghantaran / pemindahan atau pemprosesan maklumat dalam rangka ketersediaan sumber untuk kegiatan belajar (Seels dan Richey, 1994: 30).

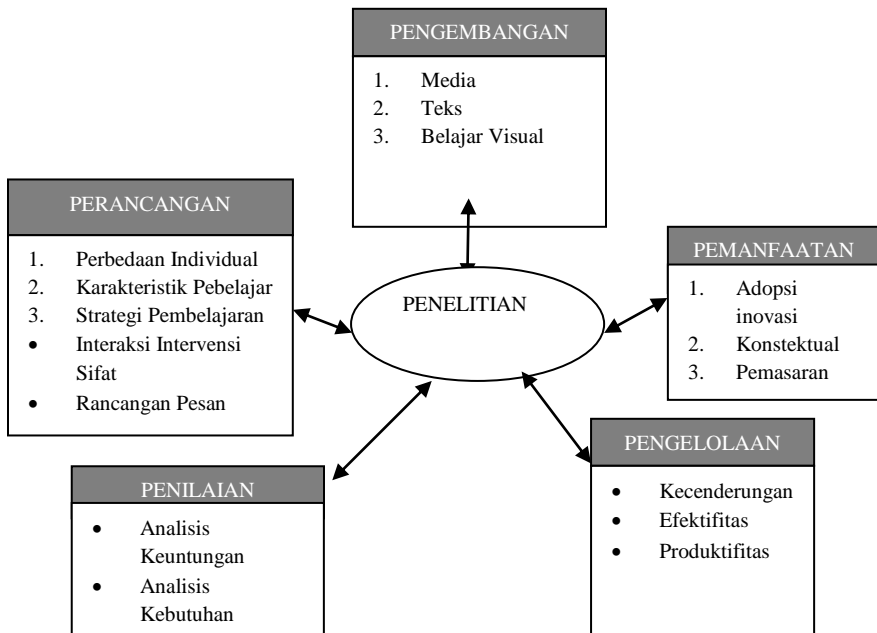
e. Penilai (Penilai)

Tugas ini meliputi menganalisis masalah, mengukur yang beracuan penanda aras, menilai secara formatif dan sumatif. Analisis masalah merupakan aktiviti penentuan sifat dan parameter masalah dengan menggunakan strategi pengumpulan maklumat dan membuat keputusan. Ukuran acuan penanda aras adalah teknik-teknik untuk menentukan kemampuan pebelajar menguasai materi yang telah ditentukan sebelumnya. Penilaian formatif adalah pengumpulan maklumat tentang kecukupan dan penggunaan maklumat sebagai asas pembangunan selanjutnya. Sedangkan penilaian sumatif berkaitan dengan pengumpulan maklumat tentang kecukupan untuk pengambilan keputusan dalam hal penggunaan (Seels dan

Richey, 1994: 30).

Bagan 1.2

Hubungan antara Landasan Penelitian dengan masing-masing Ranah Teknologi Pembelajaran



2. Profesional Teknologi Pendidikan Sebagai Pemaju Teknologi Pendidikan

1. Profesion Pemaju Teknologi Pembelajaran SK MENPAN No. 1 Tahun 2009 tentang Profesion Pembangunan Teknologi Pembelajaran

PERATURAN MENTERI NEGARA BADAN KEPEGAWAIAN NEGARA NOMOR: PER / 2 / M.PAN / 3/2009 TENTANG JABATAN FUNGSIONAL PENGEMBANG TEKNOLOGI PEMBELAJARAN

Menimbang:

- a. Bahawa dalam rangka pengembangan karier dan peningkatan profesionalisme Pegawai Negeri Sipil yang menjalankan tugas pembangunan teknologi pembelajaran, dipandang perlu menetapkan Jabatan Fungsional Pengembang Teknologi Pembelajaran dan Angka Kreditnya;
- b. Bahawa penetapan Jabatan Fungsional Pengembang Teknologi Pembelajaran dan Angka Kreditnya sebagaimana dimaksud di atas, ditetapkan dengan Peraturan Menteri Negara Pendayagunaan Aparatur Negara;

Mengingat:

1. Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional (Lembaran Negara Republik Indonesia Tahun 2003 Nomor 78, Tambahan Lembaran Negara Republik Indonesia Nomor 4301);
2. Peraturan Pemerintah Nomor 7 Tahun 1977 tentang Peraturan Gaji Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 1977 Nomor 11, Tambahan Lembaran Negara Republik Indonesia Nomor 3098), sebagaimana telah sebelas kali diubah terakhir dengan Peraturan Pemerintah Nomor 8 Tahun 2009 (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 21);
3. Peraturan Pemerintah Nomor 16 Tahun 1994 tentang Jabatan Fungsional Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 1994 Nomor 22, Tambahan Lembaran Negara Republik Indonesia Nomor 3547);
4. Peraturan Pemerintah Nomor 97 Tahun 2000 tentang Pembentukan Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 2000 Nomor 194, Tambahan Lembaran Negara Republik Indonesia Nomor 4015), sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 54 Tahun 2003 (Lembaran Negara Republik Indonesia Tahun 2003 Nomor 122, Tambahan Lembaran Negara Republik Indonesia Nomor 4332);
5. Peraturan Pemerintah Nomor 98 Tahun 2000 tentang Pengadaan Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 2000 Nomor 195, Tambahan Lembaran Negara Republik

Indonesia Nomor 4016), sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 11 Tahun 2002 (Lembaran Negara Republik Indonesia Tahun 2002 Nomor 31, Tambahan Lembaran Negara Republik Indonesia Nomor 4192);

6. Peraturan Pemerintah Nomor 99 Tahun 2000 tentang Kenaikan Pangkat Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 2000 Nomor 196, Tambahan Lembaran Negara Republik Indonesia Nomor 4017), sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 12 Tahun 2002, (Lembaran Negara Republik Indonesia Tahun 2002 Nomor 32, Tambahan Lembaran Negara Republik Indonesia Nomor 4193);

7. Peraturan Pemerintah Nomor 101 Tahun 2000 tentang Pendidikan dan Latihan Jabatan Pegawai Negeri Sipil (Lembaran Negara Republik Indonesia Tahun 2000 Nomor 198, Tambahan Lembaran Negara Republik Indonesia Nomor 4019);

8. Keputusan Presiden Nomor 87 Tahun 1999 tentang Rumpun Jabatan Fungsional Pegawai Negeri Sipil;

Memperhatikan:

- a. Usul Menteri Pendidikan Nasional dengan surat Nombor 52422 / A4.2 / KP / 2008 tanggal 22 Oktober 2008;
- b. Pertimbangan Kepala Badan Kepegawaian Negara dengan surat Nombor K 26-30 / V 6-1 / 93 tanggal 19 Januari 2009;

MEMUTUSKAN:

Menetapkan: **PERATURAN MENTERI NEGARA BADAN KEPEGAWAIAN NEGARA TENTANG JABATAN FUNGSIONAL PENGEMBANG TEKNOLOGI PEMBELAJARAN DAN ANGKA KREDITNYA.**

2. Peraturan Pemerintah Profesion Pemaju Teknologi Pembelajaran

A. BAB I KETENTUAN UMUM

pasal 1 : Dalam Peraturan Menteri Negara Pendayagunaan Aparatur Negara ini yang dimaksud dengan: 1) Pemaju Teknologi Pembelajaran adalah jabatan yang mempunyai ruang lingkup tugas, tanggung jawab dan wewenang untuk melakukan kegiatan pembangunan teknologi pembelajaran yang diduduki oleh Pegawai Negeri Sipil dengan hak dan kewajiban yang diberikan secara penuh oleh pegawai yang diberi kuasa. 2) Pembangunan teknologi pembelajaran adalah suatu proses analisis, pengkajian, perancangan, pengeluaran, pelaksanaan dan penilaian sistem / model teknologi pembelajaran. 3) Teknologi Pembelajaran adalah suatu bidang yang secara sistematis menggabungkan komponen sumber belajar yang meliputi: orang, isi ajaran, media atau bahan ajar, peralatan, teknik, dan alam sekitar, yang digunakan untuk membelajarkan peserta didik pada semua jalur, jenjang dan jenis pendidikan. 4) Angka Kredit adalah satuan nilai dari tiap butir kegiatan dan / atau akumulasi nilai butir-butir kegiatan yang harus dicapai oleh Pemaju Teknologi Pembelajaran dalam rangka pembinaan karier kepangkatan dan jabatannya. 5) Tim Penilai Angka Kredit adalah tim penilai yang dibentuk dan ditetapkan oleh pejabat yang berwenang dan bertugas menilai prestasi kerja Pemaju Teknologi Pembelajaran.

B. BAB II RUMPUN JABATAN, KEDUDUKAN, DAN TUGAS POKOK

Pasal 2 : Jabatan fungsional Pemaju Teknologi Pembelajaran termasuk dalam rumpun pendidikan lainnya.

Pasal 3 : 1) Jabatan Fungsional Pengembang Teknologi Pembelajaran berkedudukan sebagai pelaksana teknis fungsional di bidang pembangunan teknologi pembelajaran pada instansi-instansi pemerintahan. 2) Jabatan Fungsional Pengembang Teknologi Pembelajaran sebagaimana dimaksud pada ayat (1) adalah jabatan karier yang hanya dapat diduduki oleh seseorang yang telah berstatus sebagai Pegawai Negeri Sipil.

Pasal 4 : Tugas pokok Pemaju Teknologi Pembelajaran adalah melaksanakan analisis dan pengkajian sistem / model teknologi pembelajaran, perancangan sistem / model teknologi pembelajaran, pengeluaran media pembelajaran, penerapan sistem / model dan penggunaan media pembelajaran, pengendalian sistem / model pembelajaran, dan penilaian pelaksanaan sistem / model dan penggunaan media pembelajaran.

C. BAB III INSTANSI PEMBINA DAN TUGAS INSTANSI PEMBINA

pasal5

1. Instansi Pembina Jabatan Fungsional Pengembang Teknologi Pembelajaran adalah Kementerian Pendidikan Nasional.
2. Agensi Pembina sebagaimana dimaksud pada ayat (1) wajib melaksanakan tugas pembinaan, yang antara lain meliputi:
 - a. Penyusunan manual teknikal pelaksanaan jabatan fungsional Pemaju Teknologi Pembelajaran;
 - b. Penyusunan pedoman formasi jabatan fungsional Pemaju Teknologi Pembelajaran;
 - c. Penetapan standard kompetensi jabatan fungsional Pemaju Teknologi Pembelajaran;
 - d. Pengusulan tunjangan jabatan fungsional Pemaju Teknologi Pembelajaran;
 - e. Sosialisasi jabatan fungsional Pemaju Teknologi Pembelajaran serta penggunaan pelaksanaannya;
 - f. Penyusunan kurikulum pendidikan dan latihan fungsional / teknikal fungsional Pemaju Teknologi Pembelajaran;
 - g. Penyelenggaraan pendidikan dan latihan fungsional / teknikal bagi Pemaju Teknologi Pembelajaran dan penetapan pensijilan;
 - h. Pembangunan sistem maklumat jabatan fungsional Pemaju Teknologi Pembelajaran;
 - i. Fasilitasi pelaksanaan jabatan fungsional Pemaju Teknologi Pembelajaran;
 - j. Fasilitasi pembentukan organisasi profesi Pemaju Teknologi Pembelajaran;
 - k. Fasilitasi penyusunan dan penetapan etika profesi dan kode etik

Pemaju Teknologi Pembelajaran; dan
 1. Melakukan pemantauan dan penilaian fungsional jabatan Pemaju Teknologi Pembelajaran.

D. BAB IV UNSUR DAN SUB UNSUR KEGIATAN pasal6

Unsur dan sub unsur kegiatan Pemaju Teknologi Pembelajaran yang dapat dinilai angka kreditnya, terdiri dari:

- a. Pendidikan, meliputi:
 1. Pendidikan sekolah dan memperoleh ijazah / gelar;
 2. Pendidikan dan latihan (Diklat) fungsional di bidang pembangunan teknologi pembelajaran serta memperoleh Surat Tanda Tamat Pendidikan dan Latihan (STTPP) atau sijil; dan
 3. Diklat prajabatan dan memperoleh STTPP atau sijil.
 4. Pembangunan teknologi pembelajaran, meliputi:
 - a) Analisis dan pengkajian sistem / model teknologi pembelajaran;
 - b) Perancangan sistem / model teknologi pembelajaran;
 - c) Pengeluaran media pembelajaran;
 - d) Penggunaan sistem / model dan penggunaan media pembelajaran;
 - e) Kawalan sistem / model pembelajaran; dan
 - f) Penilaian pelaksanaan sistem / model dan penggunaan media pembelajaran.
- b. Pembangunan profesion Pemaju Teknologi Pembelajaran, meliputi: 1) Pembuatan karya ilmiah tulis / karya ilmiah di bidang pembangunan teknologi pembelajaran, 2) Mencari teknologi tepat guna di bidang pembangunan teknologi pembelajaran, 3) Terjemahan / penyaduran buku dan bahan lain di bidang pengembangan teknologi pembelajaran, 4) Membuat buku pedoman / petunjuk pelaksanaan / petunjuk teknikal di bidang pembangunan teknologi pembelajaran; dan 5) Pelaksanaan kajian banding di bidang pembangunan teknologi pembelajaran dan pendidikan terbuka / jarak jauh.

c. Penunjang tugas Pemaju Teknologi Pembelajaran, meliputi: 1) Pengajar / pelatih / tutor / fasilitator di bidang pembangunan teknologi pembelajaran, 2) Memberikan bimbingan di bidang pengembangan teknologi pembelajaran, 3) Keahlian dalam pasukan penilai jabatan fungsional Pemaju Teknologi Pembelajaran, 4) Peranan serta dalam seminar / bengkel / persidangan di bidang pembangunan teknologi pembelajaran, 5) Keahlian dalam Ikatan Profesi teknologi Pendidikan Indonesia (IPTPI), 6) Keahlian dalam Tim Penilai Angka Kredit Jabatan Fungsional Pengembang Teknologi pembelajaran, 7) Kejayaan penghargaan / tanda jasa; dan 8) Perolehan gelar kesarjanaan lainnya.

3. Upaya Peningkatan Kompetensi Profesional Teknologi pendidikan

Teknologi pendidikan merupakan suatu disiplin gunaan, artinya ia berkembang kerana adanya keperluan di lapangan, iaitu keperluan untuk belajar -belajar lebih berkesan, lebih berkesan, lebih banyak, lebih luas, lebih cepat dan sebagainya. Untuk itu ada usaha dan produk yang sengaja dibuat dan ada yang dijumpai dan dimanfaatkan. Namun perkembangan teknologi komunikasi dan maklumat yang sangat pesat akhir-akhir ini dan menawarkan pelbagai kemungkinan yang semula tidak dibayangkan, telah membalik cara berfikir kita dengan "bagaimana mengambil manfaat teknologi tersebut untuk mengatasi masalah belajar". Berdasarkan huraian tentang objek formal teknologi pendidikan dan profesion teknolog pendidikan, boleh disimpulkan bahawa bidang pertanian atau disebut pula amalan teknologi pendidikan meliputi segala sesuatu di mana ada masalah belajar yang perlu diselesaikan.

Sementara itu bertolak pada konsep teknologi pendidikan yang meliputi empat komponen (penyelidikan dan teori; kegiatan perancangan, pembangunan, penggunaan, pengelolaan, penilaian dan peleitian; proses, sumber dan sistem; dan belajar) semua komponen tersebut perlu dikaji dan dipelajari pada setiap jenjang, namun dengan keluasan dan kedalaman yang berbeza antara setiap

jenjang pendidikan tersebut. Para lulusan Teknologi Pembelajaran diharapkan nantinya akan mempunyai bidang kerja yang relevan salah satunya adalah pakar media. Para lulusan TP mempunyai peluang bekerja di sekolah sebagai ahli media dan peraka pembelajaran (media specialist and instructional designer), bahkan pengevaluasi pembelajaran, memperbaiki proses perkuliahan dan dengan memperbanyak teori dan / amalan di bidang kajian teknologi pendidikan reka bentuk developer. Profesi ini, perlu diwadahi dalam satu institusi, yang dalam konsep teknologi pendidikan dikenali dengan nama Pusat Sumber Belajar (Learning Resources Center). Untuk itu, maka para mahasiswa TP dibekalkan dengan sejumlah mata kuliah yang menyokong hal tersebut, di antaranya, mata kuliah di bidang media, computer, strategi pembelajaran, pengurusan pembelajaran dan kepakaran lain yang relevan. Selain menempuh jalur pendidikan formal tersebut, penyiapan tenaga teknologi pembelajaran juga boleh dilakukan dengan menempuh jalur pendidikan non formal. Para penggiat teknologi pembelajaran tersebut disebut pengamal di bidang teknologi pembelajaran. Pengamal adalah mereka yang menguasai kemahiran, baik kerana belajar mandiri, mengikuti kursus, pemagangan, latihan dll.tanpa perlu ijazah dalam salah satu atau lebih aspek teknologi pendidikan, dengan darjah mampu, mahir dan ahli. Kemahiran pengamal juga tidak perlu disokong dengan teori, konsep dan / atau hasil-hasil penyelidikan. Pengamal tersebut sebagai contoh, seorang yang mempunyai hobi elektronik, kemudian belajar sendiri bagaimana membuat rakaman pembelajaran berupa PBK (pembelajaran berbantuan komputer), atau rakaman video permainan yang mendidik. Namun tentu saja untuk boleh menghasilkan sebuah produk teknologi pembelajaran yang baik, pengamal tersebut juga harus mempunyai ilmu pengetahuan di bidang teknologi pembelajaran. Dewasa ini, para penggiat teknologi pembelajaran dari kalangan pengamal sudah banyak yang ambil bahagian dalam menghasilkan aneka bahan ajar yang berasaskan teknologi pembelajaran. Para pengamal tersebut banyak yang menghasilkan cd-cd pembelajaran,

buku teks, pembelajaran berbantuan komputer dan lain-lain. Sehubungan dengan hal tersebut, diharapkan para akademik teknologi pembelajaran yang sudah mempunyai ilmu dalam bidang tersebut harus lebih memperbaiki diri agar dapat berfungsi secara optimum salah satunya dengan mengikuti perkembangan teknologi maklumat dan komunikasi. Para akademik TP tersebut diharapkan dapat mengintegrasikan teknologi maklumat dan komunikasi dalam pelbagai produk teknologi pembelajaran yang dihasilkannya.

B. Penutup

Teknologi pembelajaran kini telah berkembang sebagai sebahagian dalam pendidikan, baik sebagai ilmu, bidang pertanian dan profesi. Teknologi pendidikan sebagai disiplin keilmuan, profesi dan bidang pertanian telah memberi sumbangan dalam pembangunan pendidikan. Dalam hal ini diharapkan para penggerak di bidang teknologi pembelajaran terus melengkapkan diri dengan pelbagai perkara salah satunya dengan meningkatkan kepakaran di bidang teknologi maklumat. Kompetensi S1 Teknologi Pendidikan ditujukan untuk penguasaan kemampuan: a) Memahami landasan teori / penyelidikan dan aplikasi teknologi pendidikan, b) Merancang pola pengajaran, c) Menghasilkan media pendidikan, d) Menilai program dan produk instruksiona, e) Menguruskan Media dan cara belajar, f) Menggunakan cara, media, dan teknik pengajaran, g) Menyebarkan maklumat dan produk teknologi pendidikan, h) beroperasi sendiri dan melatih orang lain dalam mengendalikan peralatan audiovisual. Kompetensi Paling utama adalah: 1) Mampu merekabentuk proses pembelajaran sesuai dengan ciri-ciri peserta belajar, 2) mampu membangunkan program pembelajaran, 3) mampu menggunakan dan menyebarluaskan inovasi Teknologi Pendidikan, 4) mampu menilai dan meneliti proses pembelajaran. sedangkan Kompetensi Pendukungnya adalah: 1) Mampu mewujudkan usaha bidang Teknologi Pendidikan, penyiaran dan

maklumat, 2) Mampu memberikan perkhidmatan teknikal penggunaan dan pembangunan sumber belajar di institusi pendidikan dan maklumat, 3) Mampu membangunkan program pendidikan dilembaga penyiaran dan maklumat, 4) Mampu menyiapkan tenaga pengajar bidang Teknologi Pendidikan. Selanjutnya, hal hal yang penting dilakukan untuk meningkatkan kewujudan teknologi pembelajaran adalah dengan menyebarkan konsep dan aplikasi teknologi pendidikan melalui pelbagai aktiviti seperti penerbitan, penyelidikan, pembangunan pelbagai produk untuk belajar, seminar, bengkel, latihan dan lain-lain.

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VOLUNTARY COUNSELING AND TESTING FOR COUPLES: A HIGH-LEVERAGE INTERVENTION FOR HIV/AIDS PREVENTION IN SUB-SAHARAN AFRICA

Norhudayati Mansor & Roslee Ahmad

ABSTRAK

Most HIV infections in sub-Saharan Africa occur during heterosexual intercourse between persons in couple relationships. Women who are infected by HIV seropositive partners risk infecting their infants in turn. Despite their salience as social contexts for sexual activity and HIV infection, couple relationships have not been given adequate attention by social/behavioral research in sub-Saharan Africa. Increasingly studies point to the value of voluntary HIV counseling and testing (VCT) as a HIV prevention tool. Studies in Africa frequently report that VCT is associated with reduced risk behaviors and lower rates of seroconversion among HIV serodiscordant couples. Many of these studies point out that VCT has considerable potential for HIV prevention among other heterosexual couples, and recommend that VCT for couples be practiced more widely in Africa. However, follow-up in the area of VCT for couples has been extremely limited. Thus, current understandings from social/behavioral research on how couples in sub-Saharan Africa manage HIV risks as well as HIV prevention interventions to support couples' HIV prevention efforts have remained underdeveloped. It appears that important opportunities are being missed for preventing HIV infection, be it by heterosexual transmission or mother-to-child HIV transmission by mothers who have been infected by their

partners. Based on an overview of documentation on VCT in sub-Saharan Africa, this paper proposes that increased attention to couples-focused VCT provides a high-leverage HIV prevention intervention for African countries. The second half of the paper indicates areas where VCT needs to be strengthened, particularly with respect to couples. It also identifies areas where applied social/behavioral research is needed to improve knowledge about how couples in sub-Saharan Africa deal with the risks of HIV infection. Published by Elsevier Science Ltd.

Keywords: Africa; Couples; Gender; Heterosexual HIV transmission; HIV- prevention; Voluntary counseling and testing (VCT);

1. INTRODUCTION

Most HIV infections in sub-Saharan Africa occur during heterosexual intercourse between persons in couple relationships. Women who are infected by HIV seropositive partners risk infecting their infants in turn. Despite their salience as social contexts for sexual activity and HIV infection, couple relationships have not been given adequate attention by social/behavioral research in sub-Saharan Africa. Increasingly studies point to the value of voluntary HIV counseling and testing (VCT) as a HIV prevention tool.

1.2 INSUFFICIENT SOCIAL-BEHAVIORAL KNOWLEDGE ABOUT HIV RISK AND RISK MANAGEMENT BY COUPLES

Despite the salience of couple relationships as contexts where social-behavioral, economic and other situational factors shape sexual relations and the risks of infection from HIV and other sexually transmitted diseases (STDs), current

understandings of HIV risk and risk prevention efforts by persons in couple relationships in sub-Saharan Africa and others have characterized as “extraordinary” the lack of research on the degree to which women (and by implication, men) in couple relationships in sub-Saharan Africa can control and modify their sexual relations with partners (Orubuloye et al., 1993; cf. Ezeh, 1993; Van der Straten, Kin, Grinstead, Serufilira, & Allen, 1995). Saharan Africa are unsatisfactory.

Few presentations have been made on couple-focused research or prevention interventions at recent annual international HIV/AIDS conferences (cf. 12th World AIDS Conference, 1998; XIth International Conference on AIDS & STDs in Africa, 1999; XIII International AIDS Conference, 2000). The lack of attention given to couples-related issues at international fora is both an indicator of and contributing factor to persistent gaps in current understandings about how couples deal with HIV risk in developing areas of the world. Given an inadequate knowledge base about social-behavioral issues and about the dynamics of couple relationships in particular, it may not be surprising that HIV prevention interventions for couples in sub-Saharan Africa are rare indeed (Baingana, Choi, Barrett, Bayansi, & Hearst, 1995; de Zoysa et al., 1995; de Zoysa, Sweat, & Denison, 1996; Desclaux & Raynaut, 1997; O’Reilly & Piot, 1996)

1.2.1 CURRENT APPROACHES TO HIV PREVENTION IN SUB-SAHARAN AFRICA: HOW RESPONSIVE TO COUPLES’ NEEDS?

1.2.1.1 Media-based interventions

Typically these programs are directed toward an undifferentiated public or categories of individuals that are identified as more inclined to engage in higher-risk sexual behaviors. Messages may, for example, encourage men as members of a gender category to use condoms with non-regular sexual partners, particularly female

sex workers. Media messages are less likely to address details of condom use with the mens' wives or other regular sexual partners. Media programs that depict two heterosexual partners together are more often concerned with the technicalities of safe sex (proper condom use) than with processes of communication and negotiation (or lack thereof) that affect HIV risk and prevention efforts by couples

1.2.1.2 Facility-based interventions

The small but gradually increasing number of free standing VCT centers and the even smaller number of health facilities in sub-Saharan Africa where VCT is offered, represent the other extreme from media-based programs for communicating HIV/AIDS prevention information. Rather than targeting undifferentiated publics with a one-way flow of information, VCT facilities provide health workers with opportunities both to provide clients with information, However, VCT facilities in sub-Saharan Africa are infrequently attuned to couples' needs and few couples present together for VCT. Most VCT facilities address individual clients who request HIV testing (free-standing VCT centers) and who in some cases (e.g., Uganda) are willing to pay fees for VCT, or who are invited (at urban antenatal clinics or blood banks) to be tested for HIV. In the case of antenatal clinics in sub-Saharan Africa, women frequent the facilities primarily for medical consultations, not because they seek HIV testing.

In these settings VCT clients interact individually with counseling staff. Clients are invited to rapidly think about HIV/AIDS and consider having a HIV test, but their discussions are disarticulated from the everyday realities of communicating, much less negotiating, protective actions with their partners who are absent from the VCT session After the VCT session is over, however, many individual VCT clients return to partners in couple relationships. Despite their non-involvement in pre-test decision making, these absent partners can importantly affect the decisions

that VCT clients make: to accept or refuse HIV testing, to return or not for test results and post-test counseling, to disclose test decisions and test results, and for women who find that they are infected with HIV, or to enroll where available, in short course antiretroviral therapies (e.g., zidovudine, nevirapine) to prevent mother-to-child transmission of HIV infection (MTCT).

1.3 EVIDENCE FROM STUDIES AND PREVENTION INTERVENTIONS

Studies report mixed results in terms of reduced risk behaviors and HIV infection rates and VCT seems to have little effect on pregnancy decisions by HIV-infected women (and importantly, their partners) Condom use in discordant couples in sub-Saharan Africa after VCT, for example, was more frequent and consistent in couples where men were HIV seronegative (Kamenga et al., 1991; Maposhere et al., 1996. Debates over VCT during much of the 1990 concerned the appropriateness of VCT for developing country settings as well as its effectiveness. International organizations and African health ministries were reticent because of doubts about the cost-effectiveness of VCT in countries where access to basic health services is limited. Per-capita health expenditures in sub-Saharan Africa are among the lowest in the world. They frequently recommended as well that VCT. A more detailed review of the scientific literature on VCT during this period is beyond the scope of this paper. Readers are referred to the sources cited immediately above for additional details.

1.4 MORE RECENT VCT STUDIES

Study results in the early 1990s indicated that VCT provided net economic benefits in developed country settings (e.g., Holtgrave, Valdiserri, Gerber, & Hinman. The infection costs of \$12.77 and 17.70 per disability-adjusted life-year saved in Kenya and

Tanzania respectively, compare favorably with costs of other interventions.

1.5 A FAVORABLE MOMENT FOR COUPLES' VCT AS A COMPONENT OF HIV/AIDS PREVENTION STRATEGIES IN SUB-SAHARAN AFRICA?

Studies in sub-Saharan Africa during the 1990 produced evidence indicating Regardless of study results, however, investigators were nearly unanimous in noting that VCT for couples may be a particularly powerful HIV prevention too Researchers very often recommended further studies of couples-focused VCT and called for the increased use of VCT for couples in sub-Saharan Africa. More recent results from randomized clinical trial studies in Kenya and Tanzania have provided additional evidence that VCT is an effective and appropriate prevention intervention in the resource constrained situations typical of countries.

1.6 GREATER INTERNATIONAL SUPPORT FOR VCT

The political climate also became more supportive of VCT in developing country settings during the late 1990s. UNAIDS and other international organizations engaged in HIV/AIDS prevention (e.g., the United States Agency for International Development [USAID], the World Bank) have expressed strong support for making VCT available to populations in developing countries (UNAIDS, 1998; The World Bank, 1999). Intervention research not directly focused on VCT efficacy, but which included VCT as a component, has also contributed to a change from widespread scepticism to increasing support among international agencies for VCT as a prevention tool in Africa. In 1998 the results of randomized clinical trials in Thailand.

1.7 CONCLUSION

This paper has provided a brief overview of results from recent research and HIV prevention interventions in sub-Saharan that focus on couples and HIV risks, VCT, and in particular, VCT for couples. It has been proposed that the growing body of research and program evidence from sub-Saharan Africa which is supportive of VCT for couples as a HIV prevention tool, together with an increasingly supportive international policy environment for VCT, have created a unique sociological conjuncture for HIV prevention in Africa. In effect, developments in research, interventions and policy have brought us back to basics of HIV prevention that have been neglected for too long by social/behavioral research and prevention interventions in Africa: couple relationships. This conjuncture reveals a need for change in prevention paradigms to ensure a better sociological fit between how persons in Africa confront and deal with HIV risks on the one hand, and on the other, how prevention interventions that aim to support prevention actually focus their attention and resources. More work with couples promises to enhance the already promising potential of VCT for HIV/AIDS prevention sub-Saharan Africa.

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EASING LEARNING DIFFICULTIES IN CIRCLES AMONG FOURTH FORMERS LEARNERS USING VAN-HIELE ORIENTED LEARNING INSTRUCTIONS

Chiang Kok Wei & Mohd Salleh Bin Abu

1. INTRODUCTION

In Malaysia, students are introduced with geometry since in primary mathematics curriculum. The learning of geometry continues to secondary education where more than 40% of the secondary mathematics curriculum consists of geometry topics (Idris, 2009). Geometry is a consolidative theme that has rich source of visualization for arithmetical, algebraic and statistical concepts (Sanders, 1998). However, the traditional teaching and learning pedagogy emphasize on having students learn list of definitions and properties of Circles in the classroom (Olkun et.al, 2005). This focus is misguided and causes learning difficulties among learners.

Disappointment performance on the outcomes of mathematics learning can be seen from the research done by public examinations. Reports from Malaysian Examinations Syndicate in Mathematics subject for *Ujian Penilaian Sekolah Rendah* (UPSR) year 2005 and 2007 showed low performance in Shape and Space especially in context perimeter and area. Many students fail to answer correctly and the advisement from Malaysian Examinations Syndicate to the candidates and teachers are doing more practices

and emphasizes in solving perimeter and area questions (Tan, 2011).

The report of Malaysian Examinations Syndicate (2004) showed that secondary students performed poorly in the national examination that is the *Penilaian Menengah Rendah* (PMR) and *Sijil Pelajaran Malaysia* (SPM) especially in Mathematics Paper 2. The report from International Benchmark in TIMSS 1999, 2003, 2007 and 2011 showed similar trend. Form two students did not perform well especially on the compulsory solid geometry questions. They ranked 22 out of 38 students who participated in TIMSS 1999 (Martin et al., 2000). In TIMSS 2003, they ranked 19th out of 49 students (Martin et al., 2004). This ranking reflected about Malaysian students' lack of geometric thinking ability. In addition, the poor performance in examination particularly in geometry causes discouragement among the students to move forward to another level in mathematics (Gutierrez. et al., 1991).

The weaknesses reported by Malaysian Examinations Syndicate (2004) indicated that students encountered learning difficulties in geometry including Circles. Hai and Sedig, (2010) revealed that students find it difficult to engage with mathematical concepts especially promoting visualization at higher levels in secondary school. Visualization skill is important as it relates to the content of mathematics especially in geometry and it has been linked with geometry achievement (Idris, 2005). Idris (2007) highlighted those students who have geometry concepts are often neglected in elementary and secondary level schools in favour of teaching computational skills and this causes difficulties in learning topic Circles.

Realizing that students' geometrical learning experience should be changed in a more meaningful way, the van Hiele's model of geometry thinking focuses on geometry to help students overcome their difficulties in learning mathematics (van Hiele, 1986). The model is structured and developed to provide a better understanding in learning geometric concepts (Genz, 2006). The first three levels of van Hiele model that based on the learning activities of Circles are identified as recognition (Level 1), analysis

(Level 2) and informal deduction (Level 3). For each this level, there are five learning phases that is information, guided orientation, explication, free orientation and integration which require students to progress through in order to attain the next level.

The learning instructions can be employed with the use of Geometer's Sketchpad as a tool that allows learners to play active role rather than the passive role of recipient (Bakar et al., 2009). This can help learners understand mathematical concepts in depth, meaningfully and enable them to explore mathematical ideas. For this propose, the new design of learning instructions is needed to help learners progress through the level of van Hiele geometric thinking and easing learners' learning difficulties in geometry particularly in Circles.

2. PROBLEM OF THE STUDY

Learning geometry is not an easy task. Most students do not really comprehend in learning geometry. This often leads to poor performance in geometry especially in examination (Gutierrez et al., 1991) and causes discouragement among the students to move forward to another level in mathematics (Idris, 2009). As a result, students encountered serious learning difficulties in geometry including Circles. According to Steele (2010), proper instructional strategies can help learners succeed in learning geometry.

The learning difficulties in Circles are likely due to the insufficient processes of learning with respect to the van Hiele model of geometry thinking. In particular, the learners failed to progress through the van Hiele's levels of geometry thinking as required for the proper learning of Circles to take place. As stressed by Crowley (1987), learners must progress in rank without skipping any stage in van Hiele model. Learners' progression is more dependent on the content and method of instruction from stage to another and instruction must happen at the stage of the

learning because if the instruction is delivered at a higher stage than the learner, the learner may have troubles following the next process.

The failure is normally associated with the lack of visualization skills. A learner with visualization deficits may have problems with geometric constructions that involve symmetry, chords, arcs, angles in circles and concept of cyclic quadrilaterals (Steele, 2010). While there have been a number of studies in mathematics education which related to the use of textbooks but most of these studies did not provide enough evident on designing and developing van-Hiele oriented learning instructions particularly in visualization.

Ministry of Education Malaysia has purchased the Geometer Sketchpad (GSP) license and supplied the GSP software to all secondary schools nationwide since 2004. With the implementation of this project it brings advantages to many teachers including secondary school students (Teoh & Fong, 2005). However, the GSP- assisted learning in the classrooms has not been practiced frequently (Kasmawati, 2006).

With the reasons stated above, it is important for researcher to design and develop learning instructions using this software for teaching, learning and doing mathematics. GSP is built with van Hiele model as an underlying theory because there is a harmony between the GSP software and the van Hiele theory (Abumosa, 2008) as compared to other software. Based on the scrutiny of GSP, it has several advantages to be used in classroom. The reasons are (a) it is flexible because learners can represent their ideas while allowing them to examine their representations, (b) it is dynamic because when given parameters are changed, the constructions that rely upon these changes accordingly and (c) it is easy because students can easily navigate the tool bar to draw, construct and measure.

It is undeniable of the important roles of van Hiele's model on the learning of geometry in Malaysia mathematics education. As a result, the pedagogical problems related to GSP has provoked researcher to investigate the following question – *Can I design and*

develop the learning instructions which is free and easy to use that would assist learners to progress through the van Hiele levels of geometry thinking and consequently easing their learning difficulties in Circles?

3. OBJECTIVES OF THE STUDY

The objective of the study is to design and develop GSP-oriented learning instructions (called GSP-LI) that assists students to progress through the van Hiele levels of geometry thinking and consequently eases their learning difficulties in Circles.

4. STAGES OF STUDY

This is a research and design type of study. It adopts fully ADDIE model which involves 5 stages. The first stage is analysis, the second stage is design, the third stage is development, the fourth stage is implementation and the last stage is evaluation (Baruque & Melo, 2004).

4.1 STAGE 1

This stage aims at analyzing and collecting all the essential information related to the study before the design and development of the learning instructions. Preliminary analysis showed that syllabi from Form 1 to Form 5 of secondary mathematics that involved Shape and Space are more concentrated on the last two years of education that is Form 4 and Form 5. Learners' learning difficulties in geometry based on the analysis of the performance of geometry tests were analyzed. Information regarding the teaching methods and problems encountered by new teachers and experience teachers when teaching circles were gathered and compiled. The van Hiele's levels of geometry thinking and the

learning phases related to the learning activities of Circles using GSP were addressed in this stage.

4.2 STAGE 2

This stage aims at designing the layout of each learning instructions incorporated the content and instruction. These include structuring the conceptual framework based on van Hiele model and modified Duval's model (1998). The visualization of learning activities based on the topic of Circles was formulated. This study limits its scope to the first three levels, for two main reasons. First, an analysis of the revised Form Four mathematics syllabus and Form 4 mathematics textbooks showed that the content of the circles chapter is only up to level 3. Second, previous studies have shown that lower secondary students (aged 16–17 years old) are highly unlikely to attain level 4 or 5 in circles (Idris & Tay, 2004).

At Level 1 (Recognition), learners recognize, name, and construct part of the circles to distinguish circles from each other on a visual basis. At Level 2 (Analysis), learners identify the components of circles and can discover properties of the circles by experimentation. At Level 3 (Informal Deduction) learners logically order properties of circles, understand definitions and able to build conjectures. Different learning instructions will engage with different activities based on the learning phases mapped out by van Hiele (1986).

In terms of learning activities, the researcher made a clear connection between reasoning, visualization and construction by using GSP as suggested in Duval's model (1998). The visualize process is applied to help learners to visual representation of a geometrical statement. Reasoning is discursive process for the extension of knowledge and for explanation whereas the construction process by using tools allows learners explore the relations in geometry. These three processes encourage learners to visualize, analyse a problem by constructing and then make reasoning (Kamariah *et al.*, 2009).

4.3 STAGE 3

This stage aims to develop the learning activities of visualization for the first three of van Hiele's level based on the topic of Circles and applying the learning phases based on the learning activities which concurrency to the Mathematics syllabus. There are 18 activities in all the GSP-LI with Learning Instructions 1 (Recognition), Learning Instructions 2 (Analysis) and Learning Instructions 3 (Informal Deduction) contains 7, 7 and 4 activities respectively. The GSP-LI explored learners' mathematical knowledge of circle geometry in the following areas (a) identify parts of a circle, (b) chord properties of a circle, (c) arc-angle properties of a circle and (d) tangent properties of a circle. Each of the activity required sequential phases of learning which can help learners move from one level to another.

4.4 STAGE 4

This stage aims to implement the GSP-LI during teaching and learning in the classroom. The sample of study comprises of a group of 30 students. The average age of the students was 16 to 17 years. A geometry test was adapted from diagnostic test prepared by Ministry of Education Malaysia based on chapter Circles. The adapted version of geometry test was given to an expert teacher and two experienced mathematics teachers for validation and comments. To ensure that the instruments were valid, the researcher consulted the textbooks and refers to ICSS. The reason was to gain clear perception into what the learning outcomes would be to explicate the van Hiele's levels.

The pilot study was planned to be conducted over the course of two weeks before the real field work. It was distributed to the school Mathematics teachers to be carried during the lessons which was involving different Form 4 students. During the pilot study the researcher focused on the following area: (a) the amount

of time needed by the learners to complete the test, (b) the time and details required for the learners, (c) the difficulties faced by the researcher and learners during the teaching and learning and (d) the effectiveness of the learning activities.

The GSP-LI session started with an introduction to the learners given by the researcher. This introduction session was important as to make the learners comfortable with the situation and research procedures as well as the designated learning activities they were going to undergo. The whole GSP-LI session ran for ten sessions with each session takes an hour. During each session, the researcher played the role as a facilitator and not as instructor. After the GSP-LI session over, they were tested again using the geometry test to examine if the designed and developed learning instructions really work in helping them in learning difficulties. The duration of this test was the same as the before.

4.5 STAGE 5

This stage aims to evaluate how does GSP-LI works in assisting students to progress through the van Hiele levels of geometry thinking and consequently eases their learning difficulties in Circles. A single group pre-test and post-test research design was adopted in this study. The experimental research was designed to determine the effect of independent variable towards dependent variable which is students' progression of learning difficulties. Pre-test and post-test were given to the students before and after the treatment. The research design can be exemplified as follow:

Table 1 Research Design

Pre-test	Treatment	Post-test
U_1	X	U_2

5. DATA COLLECTION

Two types of data were collected in this research study. First, the geometry test scores were conducted before and after the use of GSP-LI. Learners are considered to have achieved a particular van Hiele's levels of geometry thinking if they managed to answer correctly at least 60% of the score designated for that particular level (Usiskin, 1982). The data were analyzed using basic statistical indices by comparing the pre-test and post-test. Second, the progression of difficulties among each individual was compared. The students' progression of difficulties can be stratified based on the scoring method shown in Table 2. Then, a graph was plotted to see the progression of each individual.

6. FINDINGS AND DISCUSSION

The progression through the van Hiele's levels of geometry thinking

Using the procedures described earlier, the scores were gathered before and after the use of GSP-LI were analyzed and summarized in Table 3. Before the intervention, most of the learners were found to be at the level of Level 1 or Level 2. Some of them have achieved below Level 1. The relatively unsatisfactory condition shows that most learners only operate the lower thinking levels of recognition and analysis during the learning of geometry. This can be shown by the low mean of scores of less than 45%.

The implementation of GSP-LI seemed to adumbrate the changes of learning scenarios. The information in Table 4 clearly shows that most of the learners have managed to progress between the levels. There were marked improvements made by the learners as reflected by the raise of means from less than 45% to about 68%. These results indicate that the GSP-LI has high potential to ease learning difficulties among learners to progress through the van Hiele's levels of geometry thinking.

After finishing the post-test, students' oral communication

with the researcher was conducted to get some insights of the progression phenomenon. Some parts of dialogue are given below where R represents the researcher and S represents student.

R : What do you think about these learning instructions?

S20 : Ok.

S72 : It's good.

S77 : Easy to use.

R : Does GSP helps you in understanding this topic?

S21 : Yes!

S29: I do not need to use pencil to draw the circle.

S76 : Yup...

R : Does GSP helps you to see (visualize) better?

S7 : I can see the angle is changing when I move the cursor.

S11 : The worksheets guide me step by step.

S23 : Definitely!

From the oral communication above, students showed a positive reaction towards the learning instructions. This data gathered suggests that GSP-LI has helped them to generate interest by exploring the activities in easing their difficulties learning geometry.

Paired-samples t-test was used to determine if there was a difference between the means of both sets of data obtained from the pre-test and post-test. The paired-samples t-test shows that the research result is significant ($t = -14.98$, $df = 29$, $p < .05$) and there is difference in the progression of the van Hiele's levels of geometry thinking before and after the use of the GSP-LI (refer Table 5).

The progression of easing the learning difficulties in Circles

The progression of easing the learning difficulties in Circles was investigated further by plotting a graph to examine the progression of learning difficulties by each learner (Figure 1). This plot suggests that the use of the GSP-LI has managed to assist majority of the learners to progress from severe difficulty to moderate difficulty. Information clarified in Figure 1 and Table 3 showed that learner of S17 scored a high marks. That learner

managed to progress from ‘Severe Difficulty’ category to ‘No Difficulty’. This jump phenomenon appeared to suggest the potential of the GSP-LI to ease low achiever learners in learning of geometry. However, the learner of S44 scored a low marks that was from 31 marks to 39 marks. Although there was a slightly increase in the marks but that learner still in the ‘Severe Difficulty’ category. This unclear of non-sequential progressions will not happened if the learning instructions were used twice or repeatedly use by low achiever learners.

7. CONCLUSION

The significant differences in geometry progression indicate that the GSP serves a powerful source that can be implied in teaching geometry. In conclusion, this study provides evidence that the GSP-LI can be used to help learners to progress through the van Hiele’s levels of geometric thinking and eventually easing their learning difficulties in learning geometry. Most importantly, it serves as a platform for teachers to design and develop such learning instructions in future for geometry learning at secondary school level.

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APPENDIX

Table 2 Distributions of Scoring Based on Student's Learning Difficulties

Marks	Descriptions
70 – 100	No Difficulty
69 – 50	Mild Difficulty
49 – 40	Moderate Difficulty
39 – 0	Severe Difficulty

Table 3 The Number and Percentages of Learners based on van Hiele's Levels of Geometry Thinking Before and After the Use of the GSP-LI (n = 30)

van Hiele's levels of geometry thinking	Number of learners	
	Pre-test	Post-test
Below Level 1	7 (23.3%)	0 (0.0%)
Level 1	12 (40.0%)	8 (26.7%)
Level 2	9 (30.0%)	14 (46.6%)
Level 3	2 (6.7%)	8 (26.7%)
Mean Score	44.2%	67.9%

Note : Numbers in brackets represent the percentage of students

Table 4 The Number and Percentages of Learners Based on Different Categories of Learning Difficulties Before and After the Use of the GSP-LI (n = 30)

Learning Difficulties	Number of learners	
	Pre-test	Post-test
Severe Difficulty	14 (46.7%)	1 (3.3%)
Moderate Difficulty	6 (20.0%)	3 (10.0%)
Mild Difficulty	6 (20.0%)	11 (36.7%)
No Difficulty	4 (13.3%)	15 (50.0%)

Note : Numbers in brackets represent the percentage of students

Table 5 Test Results

Paired Sample Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre - Post	3.71111	8.66964	1.58285	95.94841	101.47381	-14.960	29	.000

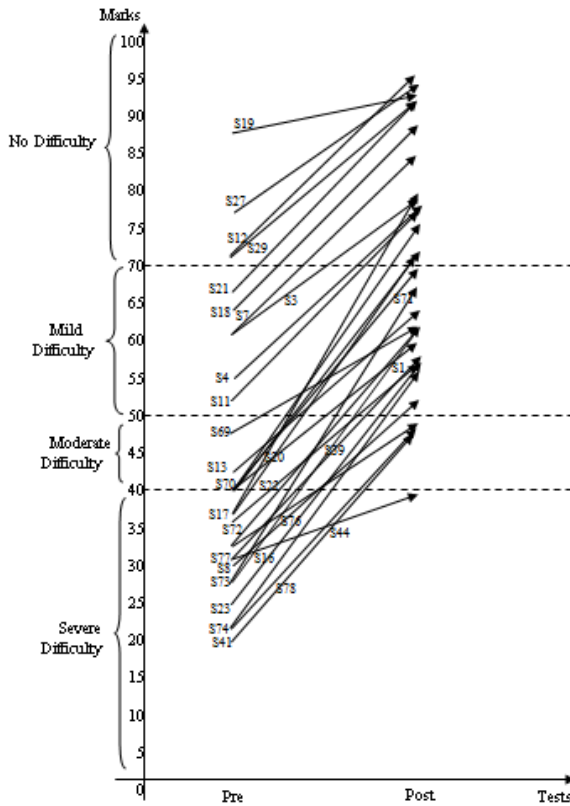


Figure 1 Plot of Mean Marks of Individual Based on van Hiele’s Levels of Geometry Thinking Before and After the Use of GSP-LI ($n = 30$)

INDIKATOR PEMILIHAN PELAJAR KE ALIRAN SAINS BERDASARKAN ASPIRASI MURID PELAN PEMBANGUNAN PENDIDIKAN MALAYSIA

Intan Bidayu Mohd Rafi & Aziz Nordin

1.14 PENGENALAN

Reformasi kurikulum berpaksikan abad ke-21 oleh semua negara menjadi tumpuan utama dalam dunia pendidikan. Malaysia juga tidak ketinggalan dengan menghasilkan satu pelan pendidikan baharu yang lebih dinamik seiring dengan keperluan semasa. Laporan awal pelan pendidikan baharu Malaysia iaitu Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 telah mula dilancarkan pada suku ketiga tahun 2012 sebagai satu pelan komprehensif dalam sasaran kerajaan untuk mencapai kelompok negara sepertiga atas, iaitu setanding negara maju dalam bidang pendidikan (PPPM, 2012) khususnya Sains, Teknologi, Kejuruteraan dan Matematik (STEM). Laporan awal dalam PPPM menunjukkan dapatan pada tahun 2011, hanya 45 peratus daripada murid yang lulus daripada sistem persekolahan merupakan murid aliran sains, termasuk aliran teknikal dan vokasional. Peratusan murid sekolah menengah yang memenuhi syarat untuk mengikuti aliran sains selepas PMR, tetapi memilih untuk tidak mengikutinya telah meningkat hampir 15 peratus. Selain itu, dapatan peringkat antarabangsa pencapaian pelajar Malaysia dalam subjek sains juga menunjukkan jauh kebelakang berbanding dengan negara maju yang lain seperti Singapura, Jepun dan United Kingdom. Lebih membimbangkan adalah isu ini telah lama dibincangkan dalam

sektor pendidikan negara dan terdapat banyak kajian telah dijalankan dalam mengenal pasti punca kemerosotannya (Siti Rahaya, 1988; Catherine dan Nicholas, 1998; Francis dan Greer, 1999; Zanaton *et al.*, 2006). Namun sehingga kini, subjek sains terus merudum dalam kalangan pelajar.

Melalui PPPM, kerajaan telah membuat pengkhususan terhadap penghasilan pelajar dengan menyenaraikan kualiti yang perlu ada dalam diri seorang pelajar secara umum iaitu Aspirasi Murid. Kerajaan memperkenalkan Aspirasi murid selari dengan Teras Kedua Pelan Induk Pembangunan Pendidikan (PIPP) 2006-2010. Aspirasi Murid ini akan memperkasakan lagi Teras Kedua PIPP dengan bertindak sebagai kualiti ciri-ciri yang perlu ada dalam diri seorang pelajar khususnya melahirkan pelajar yang kompeten dalam bidang STEM. Pelaksanaan PPPM pula melibatkan tiga fasa atau lebih dikenali sebagai Tiga Gelombang yang akan bermula dari tahun 2013 sehingga 2025. Namun, satu indikator hendaklah dibangunkan agar dapat mengenal pasti masalah yang berkemungkinan timbul sepanjang PPPM berlangsung kerana kajian indikator terhadap PPPM adalah perkara baru yang masih belum mendapat perhatian. Menurut Burhanuddin (1998), keperluan untuk membangunkan indikator dalam pendidikan amatlah penting hatta jika hanya melibatkan sebuah sekolah sahaja. Sehubungan dengan itu, artikel konseptual ini bertujuan untuk menjelaskan indikator dalam pendidikan menurut Aspirasi Murid khususnya dalam bidang aliran sains sepanjang berlangsungnya PPPM.

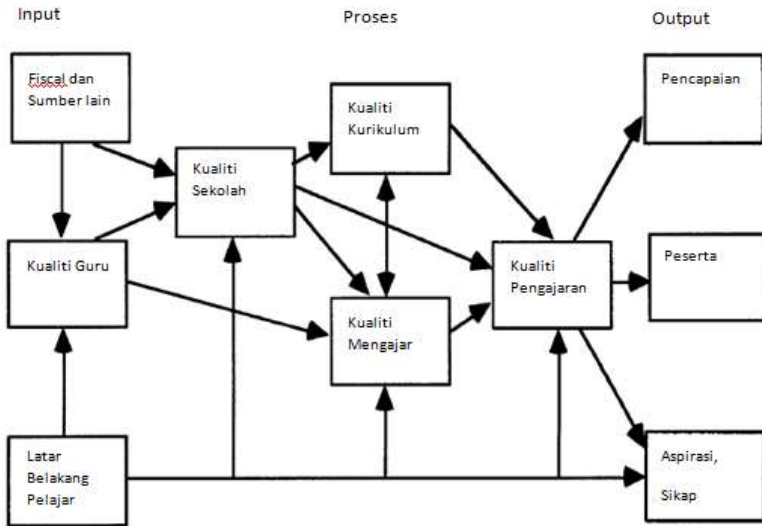
2.1 INDIKATOR DALAM PENDIDIKAN

Matlamat asal satu indikator adalah untuk mentaksir tujuan, misi, visi dan strategi sasaran dan biasanya juga indikator mempunyai tujuan analisis ke arah penambahbaikan dan pembentukan suatu polisi yang baru. Menurut Murnane dan Raizan (1988) indikator adalah satu pengukuran yang membawa tanggapan umum terhadap suatu struktur atau bagi sistem yang dikaji.

Tambahan lagi, hampir kebanyakan pengkaji pendidikan berpendapat indikator boleh juga memberi makna “piawaian” atau “*standard*” (Burhanuddin, 1998). *Standard* ini yang akan dijadikan sebagai satu penanda aras (*benchmarking*) bagi membantu meningkatkan prestasi sistem pendidikan yang dikaji. Walau bagaimanapun, kajian indikator hanya banyak dijalankan di peringkat pengajian tinggi kerana kepentingannya dilihat boleh mengatasi kekangan perubahan, kemampuan untuk membentuk satu struktur bagi penilaian dalaman dan membentuk satu komunikasi antara ahli akademik pengajian tinggi bagi membolehkan mereka berkongsi proses pengajaran dan pembelajaran mereka (Gunasekaran, 2002). Di peringkat sekolah, kajian indikator kurang dijalankan kerana indikator biasanya memberi maksud produk hasil daripada misi dan visi kurikulum negara. Hakikatnya, keperluan untuk membangunkan satu sistem indikator telah dikenal pasti oleh ramai penyelidik (Kaagan & Coley, 1989; Odden, 1990; Porter, 1991) kerana kemampuannya mengenal pasti permasalahan bagi sistem yang dikaji.

2.1.2 Model Indikator

Model indikator yang biasa digunakan dalam indikator pendidikan (Goertz & King, 1989; Kaagan & Coley, 1989; Odden, 1990; Porter, 1991; Shavelson et al., 1987; Smith, 1988) adalah model indikator oleh Oakes (1986). Model ini terbahagi kepada tiga domain utama iaitu input, proses dan output (Rujuk Rajah 1). Model ini telah dikenal pasti mengkonstruk setiap domain yang berfungsi sebagai ciri-ciri utama dalam sistem secara keseluruhannya. Contohnya, Kualiti Guru, Pencapaian Pelajar, Kualiti Sekolah.



Rajah 1: Model Indikator

2.1.3 Pelan Pembangunan Pendidikan Malaysia

Pelan Pembangunan Pendidikan Malaysia yang bermula pada tahun 2013 sehingga 2025 merangkumi tiga gelombang utama telah mensasarkan beberapa pencapaian yang perlu diperolehi dari segi kualiti, equiti dan akses dalam tempoh 13 tahun. Pelan ini juga memberi fokus kepada keberhasilan pelajar yang menjurus kepada Aspirasi Murid. Secara ringkasnya, Aspirasi Murid bertujuan untuk mencapai potensi sepenuhnya dalam diri setiap murid. Selain itu, ianya merujuk juga kepada sistem pendidikan berprestasi tinggi lain untuk membina perincian bagi kemahiran khusus dan atribut yang boleh diterapkan kepada murid bagi membolehkan mereka menerajui pembangunan ekonomi dan dunia global masa hadapan (PPPM, 2012). Ciri-ciri yang ditekankan dalam Aspirasi Murid ini mengambil kira akan kepentingan pengetahuan dalam diri setiap murid, pembangunan kemahiran berfikir, kemahiran memimpin,

kemahiran penguasaan bahasa, sahsiah dan nilai, serta semangat identiti nasional yang kuat. Ciri ini turut memberi penekanan kepada usaha bagi membolehkan semua murid memberikan sumbangan yang bermakna kepada keluarga, masyarakat, dan negara.

Namun hanya empat aspek sahaja yang akan diberi penekanan iaitu aspek pengetahuan, aspek kemahiran berfikir, aspek penguasaan bahasa dan aspek etika dan kerohanian. Ini adalah kerana bagi membina satu indikator, indikator rujukan perlulah ada bagi mengenal pasti sesuatu keadaan yang dikaji sama ada menjadi semakin baik ataupun tidak. Dalam kajian ini, indikator rujukan yang digunakan adalah menurut PPPM Kurikulum Sains negara kerana menjelang alaf 21 ini, pengertian sebagai seorang pelajar aliran sains adalah menurut matlamat atau objektif pendidikan Sains sesebuah negara (Marie, 2007). Bagi Malaysia, matlamat kurikulum Sains untuk sekolah menengah adalah bertujuan untuk membekalkan murid dengan pengetahuan dan kemahiran sains dan teknologi serta membolehkan mereka menyelesaikan masalah dan membuat keputusan dalam kehidupan seharian berdasarkan sikap saintifik dan nilai murni (PPPM Sains, 2013). Berikut akan dibincang dengan lebih teliti permasalahan yang dihadapi pelajar berdasarkan empat aspek yang diberi penekanan.

2.1.3.1 Aspek Pengetahuan

Pengetahuan merupakan sumbangan kepada pembelajaran yang baru dipelajari (O'Reilly dan McNamara, 2007). Pengetahuan juga merupakan peringkat yang paling asas perlu ada dalam diri seseorang individu kerana kefahaman awal yang berkaitan akan membantu pembelajaran yang akan datang (Maissner, 1983).

Namun, terdapat banyak kajian membuktikan penguasaan pengetahuan pelajar khususnya negara Malaysia berada pada tahap yang lemah. Sebagai contoh kajian pada peringkat antarabangsa yang disertai oleh Malaysia dalam *Trends in International*

Mathematics and Science Study (TIMSS) saban tahun merosot. Bermula dari tahun 1999 sehingga 2011, kedudukan pencapaian sains pelajar Tingkatan 2 Malaysia terus kebelakang sehingga berada bersama dengan negara mundur yang lain seperti Uganda. Selain itu, hasil daripada pentaksiran PISA juga mengecewakan. Keputusan yang diperolehi daripada 74 buah negara yang menyertai, pencapaian Malaysia ialah dalam kelompok sepertiga terbawah bagi tiga kategori utama iaitu bacaan, Matematik dan Sains di mana ianya jauh di bawah purata antarabangsa (PPPM, 2012). Pentaksiran PISA juga mendapati pelajar mempunyai pengetahuan sains yang sangat terhad dan hanya dapat diaplikasi dalam situasi yang biasa (PPPM, 2012). Pelajar dapat menyediakan penerangan saintifik berdasarkan bukti eksplisit yang diberikan, tetapi akan menghadapi kesukaran membuat kesimpulan atau interpretasi daripada penyelidikan mudah (PPPM, 2012). Ini menunjukkan ilmu pengetahuan bagi subjek sains dan matematik oleh pelajar Malaysia di peringkat antarabangsa ternyata amat mengecewakan dan ini membuktikan aspek pengetahuan menjadi antara aspek kritikal yang perlu diberi perhatian.

2.1.3.2 Aspek Kemahiran Berfikir

Setiap individu manusia telah dilahirkan dengan mempunyai kemampuan untuk berfikir mengikut tahap pemikiran individu tersebut. Tetapi, perubahan aliran perkembangan alam teknologi yang berkembang pesat pada masa kini memerlukan seseorang individu tersebut untuk berfikir aras tinggi sehingga berkemampuan melakukan inovasi menjadi keperluan utama. Hasilnya, setiap pelan pendidikan negara di dunia telah meletakkan kemahiran berfikir sebagai agenda utama dengan harapan agar terhasilnya pelajar yang hebat dalam berfikir. Pendidikan di Malaysia juga telah menetapkan kemahiran berfikir secara kritis dijadikan sebagai sebahagian daripada kemahiran dalam asas pemerolehan ilmu dan kemahiran dalam mata pelajaran (Som, 2003 dalam Marlina dan Shaharom, 2006).

Namun, isu utama dalam kemahiran berfikir adalah terdapat banyak kajian membuktikan penurunan terhadap kemampuan pelajar untuk berfikir kerana pihak sekolah yang terlalu menekankan penguasaan isi kandungan tanpa mengambil kira bagaimana proses penyampaiannya (Rosnani dan Suhailah (2003) dalam Nooraini & Khairul, 2014). Proses pembelajaran dan pengajaran masih bersifat “*chalk and talk*” walaupun zaman media teknologi terus berkembang pesat dan menguasai dunia pada masa kini. Hasilnya, masalah kekurangan graduan dalam kemahiran insaniah (*softskills*) khususnya kurang keupayaan berfikir kritis dan kreatif (Rosnani, 2012) semakin meruncing. Tambahan lagi, kajian yang dijalankan di Amerika dan Kanada oleh Stenberg (1997) dan Saeki *et al* (2001) mendapati masyarakat Asia kurang kreatif berbanding dengan masyarakat barat. Di Malaysia khususnya, hasil kajian oleh Ibrahim dalam Hani (2001) menyatakan masyarakat Malaysia banyak bersifat nomatif iaitu budaya ‘buat ini salah, itu salah, jangan buat itu’. Budaya yang diterapkan ini boleh merencatkan perkembangan kemahiran berfikir anak-anak. Yeh (1996) juga mendapati masyarakat Malaysia khususnya kanak-kanak telah ditanamkan dengan nilai-nilai muka “face value” iaitu ketulusan dalam kritikan khususnya secara terbuka wajar dielakkan untuk mengekalkan suasana harmoni di antara individu dan kalangan individu (Zanaton *et al*, 2006). Perilaku sedemikian membawa kepada perencatan peningkatan dan perkembangan kemahiran penaakulan yang seterusnya menjana pemikiran kritis dan kreatif yang diperlukan dalam pembelajaran sains (Zanaton *et al*, 2006). Kelemahan yang wujud ini meletakkan kepentingan kemahiran berfikir sebagai antara aspek yang perlu diberi perhatian seiring dengan aspek pengetahuan.

2.1.3.3 Aspek Kemahiran Bahasa

Keputusan Sains terutama dalam pendidikan Kimia bukan sahaja dari konsep pengetahuan dan amalinya, malahan dari aspek penguasaan bahasa juga amat dititikberatkan kerana peranannya

memudahkan seseorang untuk memahami konsep yang tepat. Bahasa adalah nadi kepada pembentukan pembelajaran bermakna di dalam kelas (David Chen-On Then dan Su-Hie Ting, 2011). Berbeza dengan pendidikan Sains, bahasa secara tradisinya difahami sebagai medium mudah untuk menyalurkan maklumat (Fang, 2006) mengetahui dan memahami bahasa sains adalah komponen asas dalam saintifik literasi (Wellington dan Osborne, 2001). Saintifik literasi pula menjadi keperluan setiap individu dalam memenuhi hasrat penghasilan produk inkuiri saintifik pada masa kini (NRC,1996).

Namun, kesukaran untuk menguasai bahasa saintifik terutama bagi mata pelajaran kimia tidak dapat dinafikan lagi kerana kimia mempunyai bentuk dan jenis bahasa yang tersendiri (Aziz, 2003). Fakta kimia pula merupakan pernyataan tentang bagaimana alam ini diwakilkan atau dinyatakan (Aziz, 2003). Contohnya, penjelasan atau nama mengenai bahan kimia seperti karbon diwakilkan dengan huruf C (Aziz, 2003). Konsep kimia pula kebanyakannya adalah bersifat abstrak yang akhirnya boleh menimbulkan miskonsepsi kepada pelajar. Ini dikukuhkan dengan banyak kajian membuktikan terdapat kelemahan yang ketara bagi penguasaan bahasa saintifik dalam kalangan pelajar. Kajian oleh Lynch (1979) mendapati penulisan konsep sains oleh pelajar sekolah tinggi di Tasmania adalah berbeza tahap kefahaman mereka. Kajian di Amerika oleh 2000 *National Assessment of Educational Progress* (NAEP) bagi pentaksiran sains (NCES, 2003) yang melibat aspek penguasaan bahasa saintifik pula mendapati lebih daripada dua per tiga yang berumur 13 ke 14 tahun dan tiga per empat yang berumur 17 ke 18 tahun adalah di bawah tahap penguasaan. Tambahan lagi, para pengkaji terdahulu juga mendapati antara penghalang terbesar dalam mempelajari Sains adalah bahasa Sains itu sendiri (Lemke, 1990; Wellington & Osborne, 2001).

2.1.3.4 Aspek Etika dan Kerohanian

Secara umumnya dalam aspirasi murid, aspek etika dan kerohanian bermaksud menyediakan dalam diri setiap murid bagi mendepani cabaran yang akan ditempuhi dalam kehidupan dewasa, agar mereka boleh menyelesaikan konflik secara harmoni, bijak membuat pertimbangan, berpegang kepada prinsip ketika berada dalam situasi yang kritikal, serta berani melakukan sesuatu yang betul (PPPM, 2012). Dari aspek pendidikan Sains, kepentingannya untuk membina sikap terhadap sains telah disedari sejak lama dulu (Osborne J., *et al.*, 2003). Menurut Salta dan Tzougraki (2004), sikap adalah kecenderungan untuk berfikir, berasa atau bertindak secara positif atau negatif terhadap objek yang berada dalam persekitaran kita. Manakala, Yara (2009) mendefinisikan sikap terhadap sains sebagai minat atau perasaan terhadap mempelajari sains. Ianya adalah kecenderungan pelajar untuk suka atau tidak suka terhadap subjek sains. Selain itu, terdapat kajian terdahulu yang mengaitkan sikap dengan pendidikan sains dimana ianya berfokuskan kepada definisi terhadap sikap saintifik. ("Dutton & Stephens, 1963; Haney, 1964; Diederich, 1967; Vitrogon, 1967a" dalam Michael P. Freedman, 1997). Schibeci (1983) membezakan sikap terhadap sains dan sikap saintifik dengan sikap saintifik mempunyai orientasi kognitif yang lebih banyak manakala sikap terhadap sains lebih kepada emosi atau perasaan. Namun, minat pelajar terhadap Sains semakin menurun di Malaysia khususnya dalam kalangan pelajar peringkat menengah (Zanaton, 2006). Menurut Razila (1998), pelajar menganggap bahawa mata pelajaran Sains bukan sahaja membosankan tetapi terlalu abstrak. Selain itu pelajar juga beranggapan bahawa kerjaya Sains tidak membawa kepada pekerjaan serta pendapatan yang lumayan (Zanaton, 2006). Persepsi negatif yang diberikan oleh pelajar ini menunjukkan Sains semakin dipinggirkan oleh pelajar.

3.0 Kesimpulan

Artikel konseptual ini membincangkan kepentingan indikator menurut acuan negara kita iaitu aspirasi murid PPPM. Pembentukan satu indikator penting dalam mengenal pasti permasalahan yang berlaku sepanjang pelaksanaan PPPM. Empat aspek yang diberi penekanan ini pula adalah selari dengan kurikulum Sains PPPM.

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