# TECHNOLOGY APPLICATIONS IN CHAM LANGUAGE CONSERVATION

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# 1.1. Introduction

- Language is important in communication, dissemination and cultural preservation.

- Information technologies (IT) is also an important to introduce knowledge, culture and language of a community to others (Sepe, 2001).

- Cham people is  a group of Champa kingdom. However, Cham script today is facing a massive extinction.

# 1.1. Introduction (cont.)

Types of Cham script:

- **Ancient Cham script** (ACS) first appeared on the Vo Canh stone stele in the *second century* (Filliozat, 1969).

- **Traditional Cham script** (TCS) appeared on stone stele of Po Rome tower *in the 17th century* (Dharma 2006; Lafont, 2011).

- **Modified Cham script** (MCS) appeared in 1978 by Cham Textbook Compiling Committee (CTCC) (Ty, 2006).

# 1.1. Introduction (cont.)

- Therefore, finding solutions to preserve the Cham script is necessary when most of value document of Champa Kingdom or materials in Cham villages are needed to continue studying before ruining due to old paper.

- In my research, information technology is one of useful solutions to preserve the Cham script.

# Research Questions

- What is the choice of Cham script among Cham people?

- How to develop application technology for Cham's script preservation (such as Cham fonts, and convert Cham font)?

- What is the acceptable level of the product for ease of use, convenience and quality?

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# 2.1 Population and Sample

Total population: 420 included two groups:

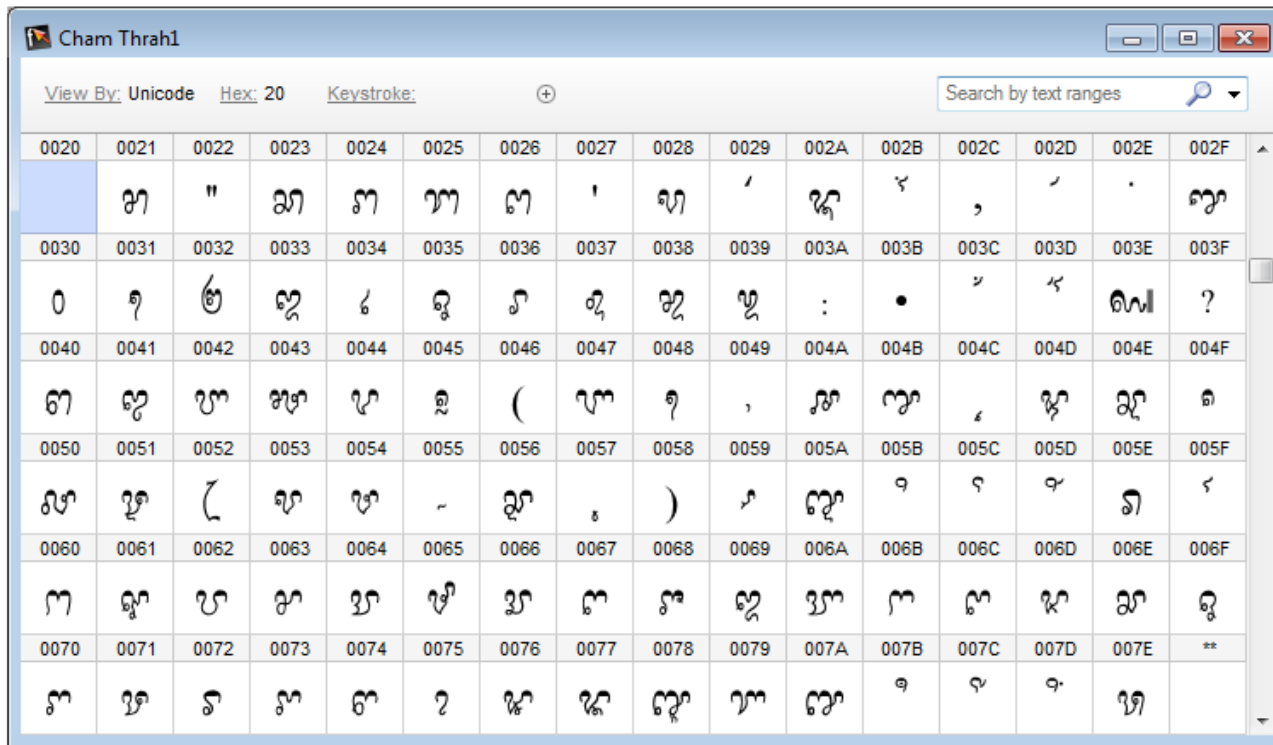   1) university students, working people;

   2) religious people.

According to (Krejcie & Morgan, 1970), the sample size representative of two groups is 200.

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

# 2.2 Cham Font Design

**Typeface based on:** Cham-Vietnamese-French dictionary of G. Moussay

The total numbers of Cham script character need to design are 90 characters.



Code point location of Cham Thrah font

# 2.3 Cham Font Conversion Method
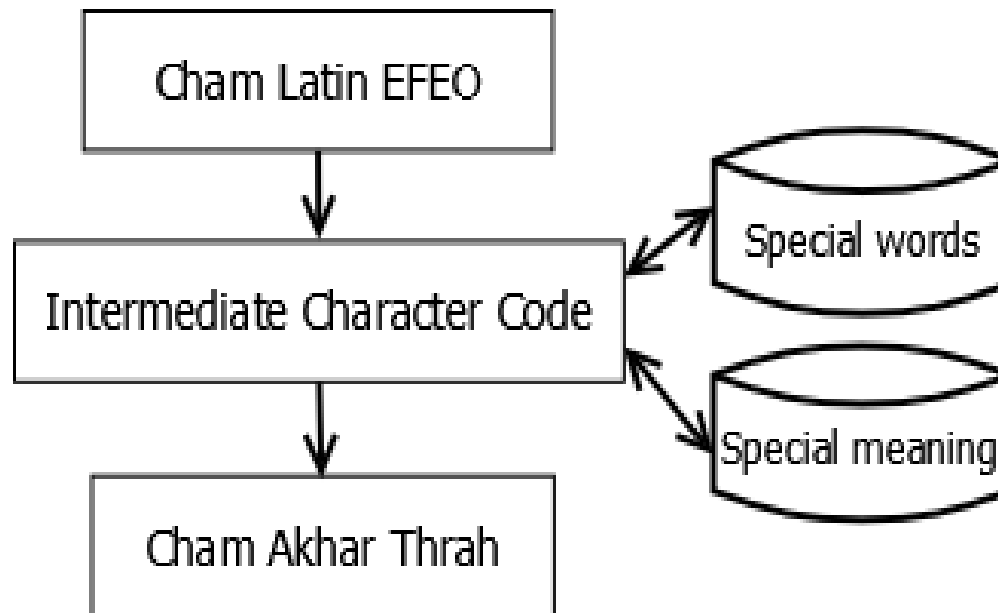


Diagram of converting Cham Latin to Cham script

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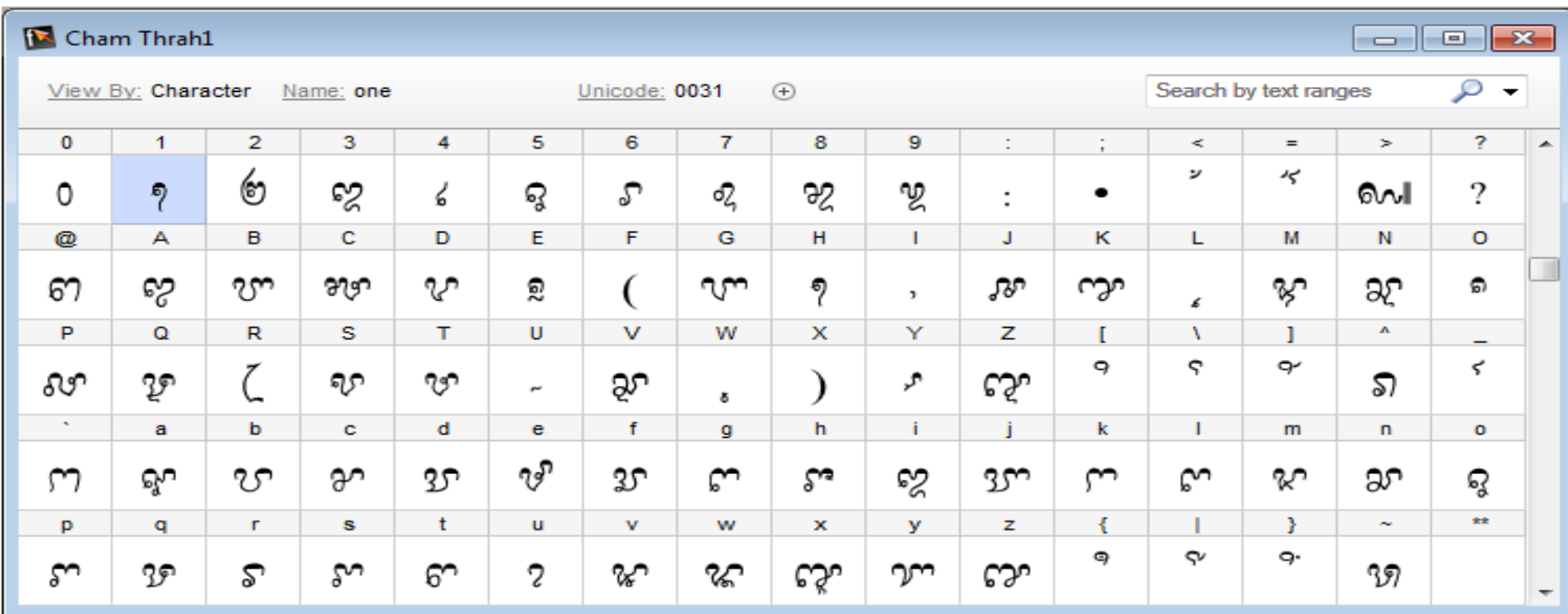
# 3.1. Exploring the Preferable Cham Script

- A survey with 200 samples for two group are Religious group and Student, Working group.
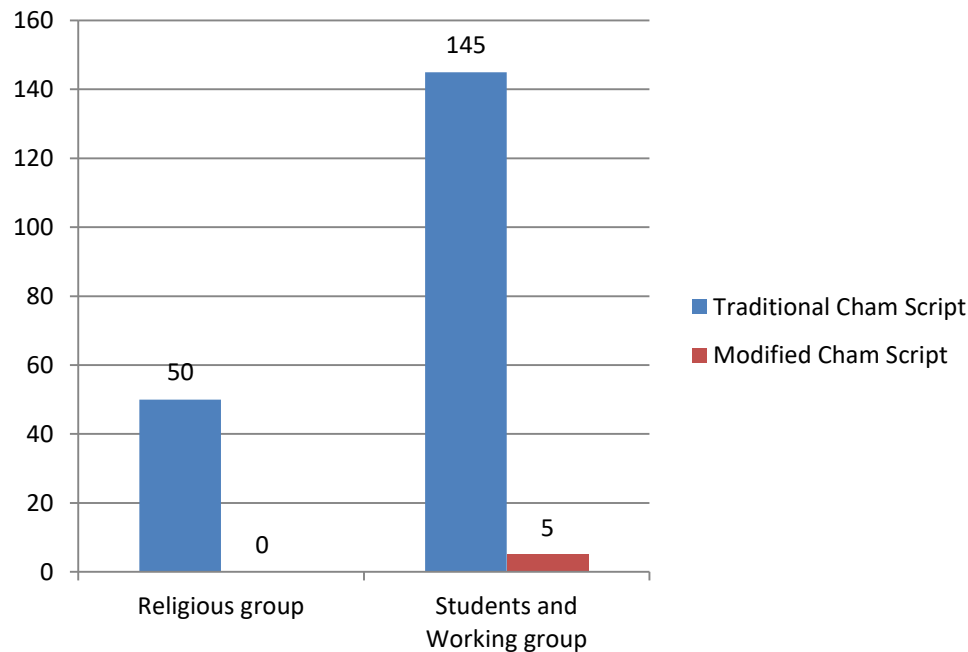


Traditional Cham script: 97,50% supports by two groups
whereas only 2,50% supports for using the Modified Cham script.

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# 3.2 Creating Cham Font

- Fontographer was use for design Cham font
- Cham font designed for two keyboards: Macintosh and Windows.
- *Cham Thrah* font typeface is based on Cham - Vietnamese - French dictionary.

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# Cham Keyboard

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# 3.3 Cham Font Conversion Evaluation

- In this experiment the program has been tested with four Cham Poems from EFEO Cham Latin to traditional Cham script.

| 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 |

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- The interface on testing Cham Latin to Cham script

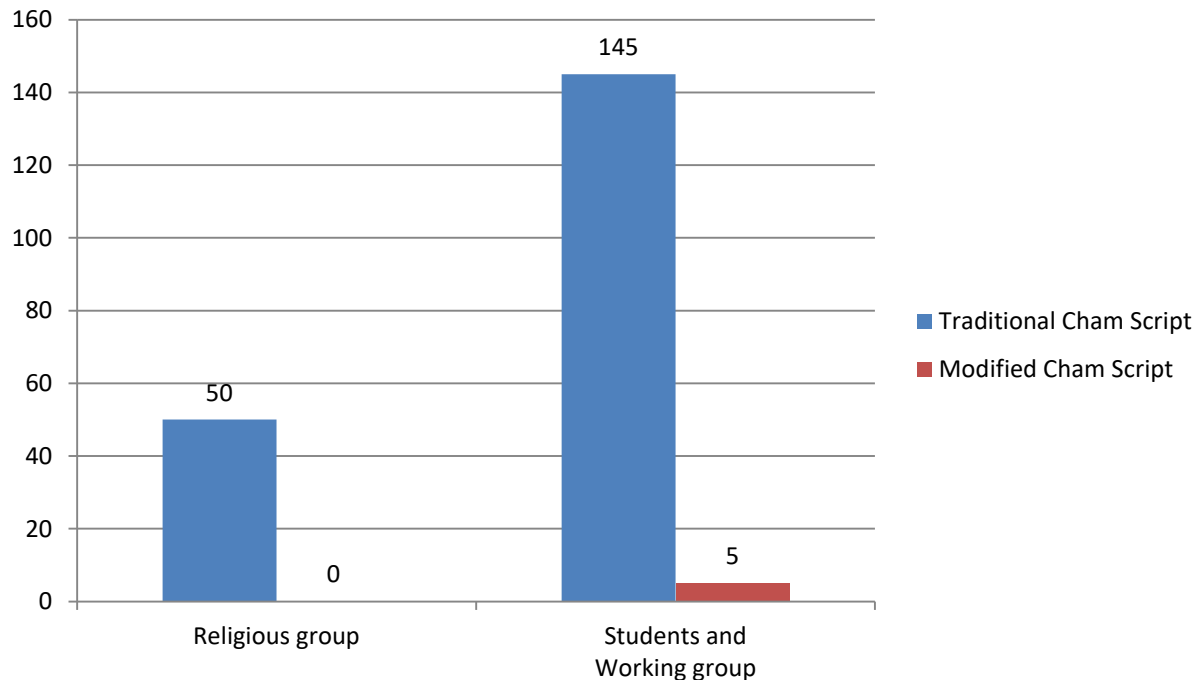innovative • entrepreneurial • global

# 4.1  RESULTS

- What is the choice of Cham script among Cham people?

Traditional Cham script: 97,50%

Modified Cham script:  2,50%

There is 100% concern the Religious group supported the Traditional Cham script.

# 4.2 Testing Cham Font

- 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.

- The cham thrah font can use for both Windows and Macintosh keyboard,

- 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%).

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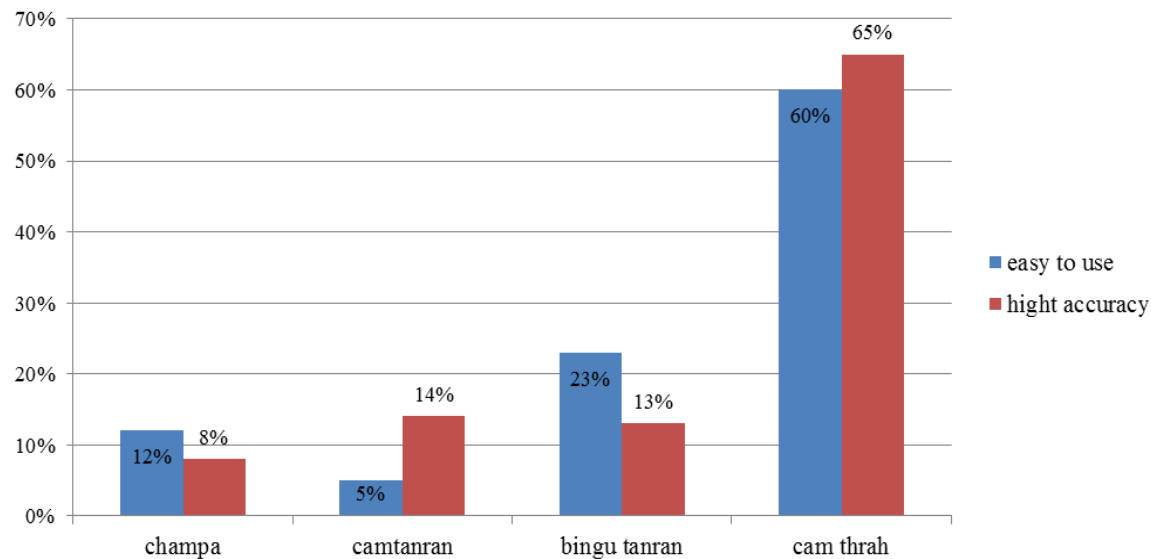
# 4.3 Testing Cham Font Conversion

The accuracy percentage of four Cham Poems:

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 teaching and learning Cham language

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# 5. CONCLUSIONS

- This study has been conducted to identify the choice of Cham script among Cham people about traditional Cham script and modified Cham script

- Cham fonts have been design based on Unicode and using for both Macintosh and Windows keyboard. Hence, Cham script character and Times New Roman characters have the same size

- Applications of Cham font conversion from EFEO Cham Latin to traditional Cham script were highly accurate.

Information technology applications is very useful (Cham font and Cham font conversion) and has an important role in Cham language conservation.

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