

# Assisting Vocabulary Acquisition and Script Writing Skills Using Mobile-based Kapampangan Intelligent Tutoring System

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**Abstract:** The popularity of intelligent language tutoring system is gaining traction worldwide but very few studies were actually conducted towards its use particularly among indigenous languages that have its own script writing system. In the case of the Philippines, there are more than hundreds of languages being spoken, unique to these is the Kapampangan language – a language that has its own writing system which follows a top-down-left-right writing sequence and uses diacritical marks to change the vowel sounds. This paper intends to develop a mobile-based ITS for Kapampangan language where the needs of the intended users are considered. It also aims to contribute towards the body of knowledge by implementing a quasi-experimental research design to determine the effectiveness and usability of the developed ITS towards enhancing vocabulary acquisition and script writing skills in Kapampangan using spaced repetition algorithm and metaphor as pedagogy. The proposed methodology and framework are also discussed.

**Keywords:** Kapampangan, indigenous language, intelligent tutoring system, mobile-assisted language learning, script writing skills

## 1. Introduction

*Kapampangans* (Kapampangan people) is the 6th largest ethnic group (“Census of Population,” 2010) and the Kapampangan is among the major languages spoken by many Filipinos. It is widely spoken in both Pampanga and southern Tarlac in the Philippines. It is an indigenous language that has a writing system which follows vertical writing (i.e., top to bottom and right to left) (see Figure 1).



Figure 1. “Kapampangan” written using the Kapampangan script

United Nation said that more than one language is dying each month while many more are at risk (UNDESA, 2016). One of these is Kapampangan language, the language is said to be endangered as pointed out by Pangilinan (2009) where he described how it is dying and in terminal decline particularly among highly urbanized cities of Pampanga (including Angeles City), Pangilinan (2019) revealed that this is due to lexical borrowing from Tagalog and the Kapampangan language can be categorized as definitely endangered (Brenzinger et al., 2003). San Andres (2012) also believed that Kapampangan is indeed a dying language and this is due to contributing factors such as disuse of the language in

literature. While Tayag (1985) provide a dire warning about the possible extinction of the language as more *Kapampangans* transition to Tagalog.

To this date, there are no studies on the use of intelligent tutoring system for Kapampangan vocabulary acquisition and script writing skills. Thus, the study intends to investigate on the effectiveness and usability of the developed intelligent language tutoring system for Kapampangan vocabulary acquisition and script writing skills for first language learners. Specifically, the study attempts to answer the following questions:

1. How may the vocabulary acquisition and script writing skills of the control and experimental groups be described before using the ITS?
2. Is there significant difference between the vocabulary acquisition and script writing skills before the use of ITS?
3. How may the vocabulary acquisition and script writing skills of the control and experimental groups be described after using the ITS?
4. Is there significant difference between the vocabulary acquisition and script writing skills after the use of ITS?
5. How may the level of acceptance of the participants on the use of ITS be described?
6. What are the challenges encountered by the participants on the use of ITS?
7. Based on the findings of the study, what are the implications of the developed ITS in language acquisition?

## 2. Objectives of the Study

1. To develop an ITS for Kapampangan vocabulary acquisition and script writing skills;
2. To implement the spaced repetition algorithm and metaphor as pedagogy in the proposed ITS;
3. To investigate on the effectiveness of the developed ITS; and
4. To surface the implications of the developed ITS in language acquisition.

## 3. Proposed Methodology

### 3.1 Research Framework and Software Development Life Cycle

The study intended to use quasi-experimental research design involving 2 group of participants, the control and experimental (see Figure 3) to determine the effectiveness of the developed mobile-based ITS in in vocabulary acquisition and development of script writing skills. The study also planned to follow the user-centered design approach process in developing the ITS (see Figure 2). The mobile-based ITS will implement a spaced repetition algorithm together with a metaphor as pedagogy. The spaced repetition will be used to automatically adjust the content, exercises, and answer choices within the developed ITS based on their performance while the metaphor as pedagogy will be applied to enhance the pupil's vocabulary acquisition and script writing skills.

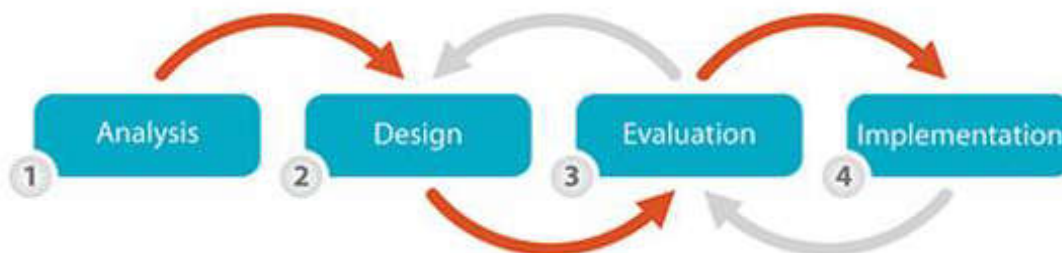


Figure 2. User Centered Design Process (usabilla.com)

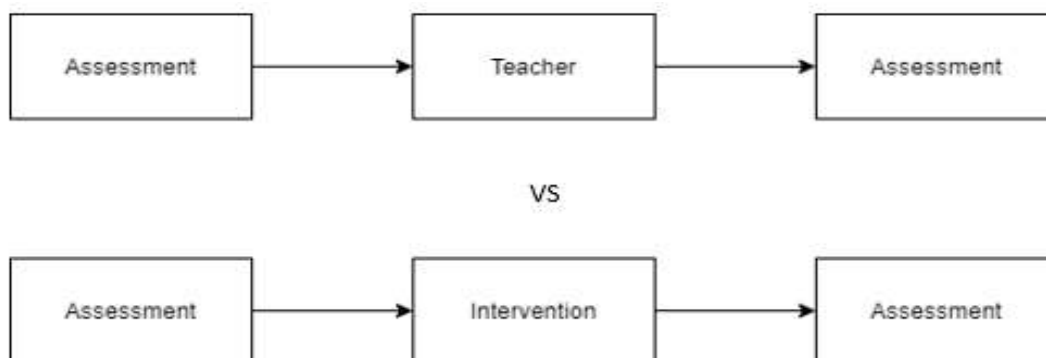


Figure 3. Research Design

### 3.2 Experimentations

The study will be conducted in one public school in Pampanga where Kapampangan is taught. According to the Holy Angel University’s Center for Kapampangan Studies, the Kapampangan language is mostly taught among Grade 1 to 3 pupils. The study will choose Grade 3 pupils as participants of the study to avoid saturation of data. The participants will be chosen based on their general weighted average (GWA) and their exposure to the Kapampangan language. The study will be composed of two experiments, in the first experiment, a pre-assessment will be given to the participants followed by the human teacher teaching both Kapampangan vocabulary and script writing, and will end with post-assessment test. Afterwards, the developed mobile-based Kapampangan ITS will be administered in the second experiment; it will follow the same process except that the mobile-based Kapampangan ITS will replace the human teacher in the first experiment.

### 3.3 Data Collection and Analysis

The interactions in the mobile-based Kapampangan ITS will be stored in the system in the form of logs. The primary data to be use for analysis will be collected based on the post-assessment exam in both experiments. A *t*-test (independent samples) together with descriptive statistics summary will be interpreted and reported. A test of difference will also be implemented towards the two sets of participants to determine if there is a statistically significant difference between their scores. Additionally, a *p*-value of 0.05 and 0.95 reliability will be used to determine the significance of the findings.

## 4. Conceptual Framework

The study intends to adopt Garette’s Five Planes framework which consist of strategy, scope, structure, skeleton and surface (see Figure 4). Through this framework, it aims to develop from bottom to top to provide a better user experience to users.

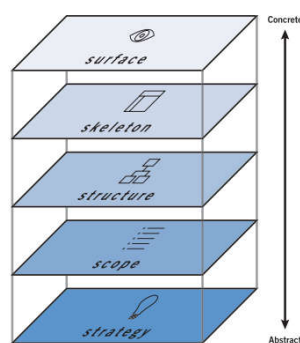


Figure 4. Conceptual Framework – Five Planes (Garrett, 2003)

## Acknowledgements

I would like to thank my immediate supervisors Dr. Vicky Vital, Dr. Mildred Crisostomo, Dr. Robin Dimla, co-faculty Dr. Jumel Miller of Don Honorio Ventura State University, and Dr. Shirley Moraga and Dr. Rex Bringula of University of the East for their time, valuable inputs, and encouragement to pursue this study.

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