

A Design and Effects of a Mobile App for Language Learning: Stakeholder Perspectives

*Muneeroh Phadung**, Lecturer, Faculty of Science Technology and Agriculture, Yala Rajabhat University, Yala, Thailand.

E-mail: muneeroh.p@yru.ac.th

Praewsree Dermrach, Lecturer, Faculty of Science Technology and Agriculture, Yala Rajabhat University, Yala, Thailand.

Nantana Rattanachai, Lecturer, Service Department, Yala Rajabhat University, Yala, Thailand.

Abstract--- In the 21st century, learning technologies appear to be widespread in many learning environments. This current study aimed 1) to design and test a mobile application for enhancing Thai language learning of Thai pupils, and 2) to examine a satisfaction level of different stakeholders through the use of the mobile application. Regarding the application design, the finding was that the course content of Thai intonation marks presented as animated fingers promoted the Thai pupils to learn Thai intonation marks pronounced by using finger counting. With respect to the results on the use of the application, the average of the post-test scores of the pupils was higher than the mean scores of their pre-tests (at the significance level of 0.05). In terms of the satisfaction levels of different stakeholders, the Thai teacher participants were among the groups who were most satisfied with the use of the application at a very good level ($\bar{X} = 4.51$; S.D. = 0.34), while the Thai parent and the pupil participants showed their satisfaction at a good level ($\bar{X} = 4.44$; S.D. = 0.32 for the parents and $\bar{X} = 4.45$; S.D. = 0.39 for the Thai pupils). The study results showed that the multimedia design was appropriate for the use of learning the Thai language in the way that the animations in the application improved pupils' learning performance. Further studies on models and effects on the use of mobile applications for language learning were also suggested and discussed.

Keywords--- Mobile Application, Multimedia Learning, Language Learning, Intonation

I. Introduction

Following a fast-growing trend in smart phones and other digital devices, mobile applications (hereafter, apps) inevitably influence peoples' hectic lives because of their user-friendliness, affordable prices and desirable multi-functionalities. These days, each individual spends more time using their smart phone than their personal computer on account of Internet access. Interestingly, 90% of their time is spent on mobile apps. Consequently, mobile apps tend to be an essential element of human activities [1]. In education, smart mobiles have recently been addressed as a new technological tool for learning. They have become aspirational status symbols, especially among curriculum developers, who see that the multimedia capabilities of modern mobile phones can bring a new dimension to curriculum designs. To illustrate this point, the use of mobile devices transforms the way individuals learn in many aspects. First, it changes a traditional classroom to be interactive, engaging, and useful. It also makes teaching less tied with time and places in which learners can access learning contents after each class more effectively. Lastly, it helps build a personal relationship between an instructor and learners in that mobiles are used on a regular basis by them, enabling learning styles to be more personalized and less formal [2].

Mobile-assisted language learning (hereafter, MALL) is an educational trend situated in the context of language learning. Now, the ready availability of MALL, which many learners can also possess, is attracting scholars' attention who work in the areas of language teaching and learning. For examples, G. Stock well, P. Hubbard used a variety of sources to lay down ten principles of MALL. However, they realized that the principles, which they attempted to base, have some negative connotations. Therefore, they urge all scholars to look into these MALL principles [3]. They have agreed that an instructor who uses mobile MALL should:

- 1) Make a distinction between the strengths and the weaknesses of the mobile device in terms of the learning environments and the purpose of using it;
- 2) reduce multi-tasking and distractions which may occur during the learning;
- 3) push the learners into learning, but respect their boundaries. Their suggestions are to allow the learners to control their learning, and to give them some time to help them push themselves harder;
- 4) maintain equity. They advised that the instructor should consider what device the learners have and take the compatibility and functionality their mobile phones into account (e.g. considering how consistent device connectivity is or considering whether the use of devices is worth the expense);
- 5) understand language learner differences. For example, the instructor should

find whether some learners have difficulty in hearing or using small keypads and touch screens; 6) be mindful that some language learners have never use MALL before. They might resist because of their culture. We believe that if the users are familiar with the use of apps, it is likely for them to accept MALL; 7) make sure that the instructions of MALL activities and tasks are clear; 8) ensure that the design of MALL tasks are suitable for the learning environment; 9) realize that most learners need guidance and possibly some practical training prior to the use of MALL, and 10) recognize that MALL should accommodate different stakeholders. The instructor should recognize that in both educational and workplace environments, the use of MALL is one of the effective ways to learn a target language. Indeed, MALL is considered to be useful, but the needs for content learning and language learning can either merge or clash.

Several studies showed positive results of language learning through the implementation of mobile apps. First, the research was done by F.D Deris and N.S.A Shukor on students' acceptance and the features of mobile apps for learning lexicons through several mobile apps. Using purposive sampling techniques to select thirty-three students to learn lexicons independently and employing in-depth interviews and surveys as data, the study showed that the participants were optimistic about their learning through the mobile apps and satisfied with the apps' features. The study also addressed many challenges in lexical learning of the students through the mobile apps which the app developers and language teachers should be concerned with [4].

E. M. Luef, B. Ghebru & L. Ilon [5] also conducted a study on language learning using mobile applications in two major Korean universities. Since Koreans are recognized to be high-tech users and enthusiastic about language learning, they appear to be an excellent example of how technology is integrated with learning. In their study, students who studied languages such as German, Swahili, Hausa, and Zulu were asked to inform how smartphones played a role in their language learning at private and institutional settings. One significant result was that mobile apps helped to enhance their language proficiency. It is also found that there was an interactive effect on language learning between English and other languages regarding the use of mobile apps [5]. Lastly, the study undertaken by M. Amer investigated a mobile software app used for learning idioms and collocations. Forty-five language learners took part in the research and were asked to use the app for a week. Regarding the use of a questionnaire, and follow-up interviews as data, the study showed that there was a correlation between usage of the app and the participants' average scores seen in the quizzes. Their usage was contingent on several factors, including their language proficiency, their average daily use of mobile devices and their motivation and learning goals. The result also showed that the participants had clear and positive perceptions on the use of mobile technology which supported language learning. The study also highlighted the value on providing learners with resources which could enhance their language learning about the idiomatic expressions and collocations [6].

In relation to the setting of our study, educational management in Thailand's three Southern border provinces is seen as the context of a multi-cultural society. This means the community appears to be different from other backgrounds across the nation. Some essential elements for developing quality education in this area include teacher development, the participation of parent bodies to manage education and the development of educational innovations. These are considered to help diminish problems about educational issues, especially the use of Thai intonation, which appears to be the major problem of many school pupils within the area. Such difficulty remains, mainly because the majority of the pupils use Thai as their second language. In other words, the Malay is primarily spoken as the first language in their everyday life [7].

In the Thai language, each syllable is pronounced in one of the following five tones: low, mid, high, falling, or rising. A sound of every syllable must be pronounced rightly to ensure that the intended meaning makes clear. Since every word contains one particular tone, it is apparent that Thai intonation marks are found to be a struggle for many Thai second language speakers [8]. To fill the gap of these educational problems and needs, the focus of this study was on designing and testing a mobile app for Thai language learning of Thai students in three southern border provinces.

II. Study Objectives and Research Questions

The study aims to design and test a mobile app for Thai language learning of pupils, and to examine the satisfaction level of stakeholders through the use of the mobile app. The research questions were as follows:

1. What are the pupils' achievements after the use of a mobile app for language learning?
2. To what extent are satisfaction levels of teachers, parents and pupils associated with the use of a mobile app for Thai language learning?

III. Methodology

This current study was a quasi-experimental research design which employed purposive sampling to select the participants. There were 270 participants in total, all of whom were 90 school teachers, 90 pupils' parents and 90 elementary pupils between year four and year six who studied at elementary schools within three southern border provinces of Thailand at the time when this study was conducted. Concerning the use of the mobile app, the study was undertaken in two stages. First, it explored pupils' achievement after the use of the mobile app for Thai language learning. Second, it examined their satisfaction level on the use of the app.

Moreover, the study also gained insights into the school teachers and pupils' parents into the use of the mobile app. Also, pre- and post-tests developed to assess learning outcomes were also examined by three experts in educational measurements and evaluation to validate the IOC content (Index of Item Objective Congruence). The tests which had index values between 0.6 and 1.0 would be employed for the study in which later we took suggestions from the experts to improve the tests again. Also, a pilot study was performed to obtain reliability with KR-20 = 0.82 in advance of using the tests in the actual research. Before the use of the mobile app, it was primarily evaluated by six experts: the first three experts were those who had expertise in multimedia for learning, and the others were the experts in the Thai language. Although they stated that the quality of the app was considered to be at a very satisfying level ($\bar{X} = 4.60$, S.D. = 0.46), we further improved the app according to their suggestions. The mobile app consisted of images, animated pictures, texts, narration and music. An instructional design and instructional system flowchart are described below.

3.1 The Instructional and Multimedia Design

Among several types of mobile apps for learning, this app design was based on a multimedia learning concept applied with Thai intonation marks. The main content of the app was Thai intonation marks containing five tones: low, mid, high, falling and rising. Figure 1 shows a hand with five animated fingers in which each finger was equipped with sound so that it enabled pupils to move their fingers together with the animated fingers in real-time.



Figure 1: A Screenshot of the Mobile App for Thai Language Learning

In regard to the design of the app, we used characters of pupils which reflected a multi-cultural society where the pupil participants lived.



Figure 2: The Illustration of Multi-Cultural Characters of Pupils

Furthermore, we also developed the mobile app based on mobile-assisted language learning principles as shown in Table 1.

Table 1: Mobile App Design based On Mobile-Assisted Language Learning (MALL) Principles





MALL principles[3]	Screenshots of the mobile app
<p>Appropriateness of use: delivering the content in the user-friendly format.</p>	
<p>Flexibility of use: deviding the content into small units.</p>	
<p>Tolerance for error: scaffolding and supporting pupils' learning methods suitable for them.</p>	

Table 2: Mobile App Design based On Mobile-Assisted Language Learning (MALL) Principles (Cont.)

MALLprinciples[3]	Screenshots of the mobile app
Instructional climate: showing push regular reminders, quizzes, and questions to pupils.	

3.2 The Instructional System Flowchart

The internal structure of the app was divided into four parts: lessons, games, quizzes and program information. Figure 3 shows the instructional system flowchart for the whole content of the app.

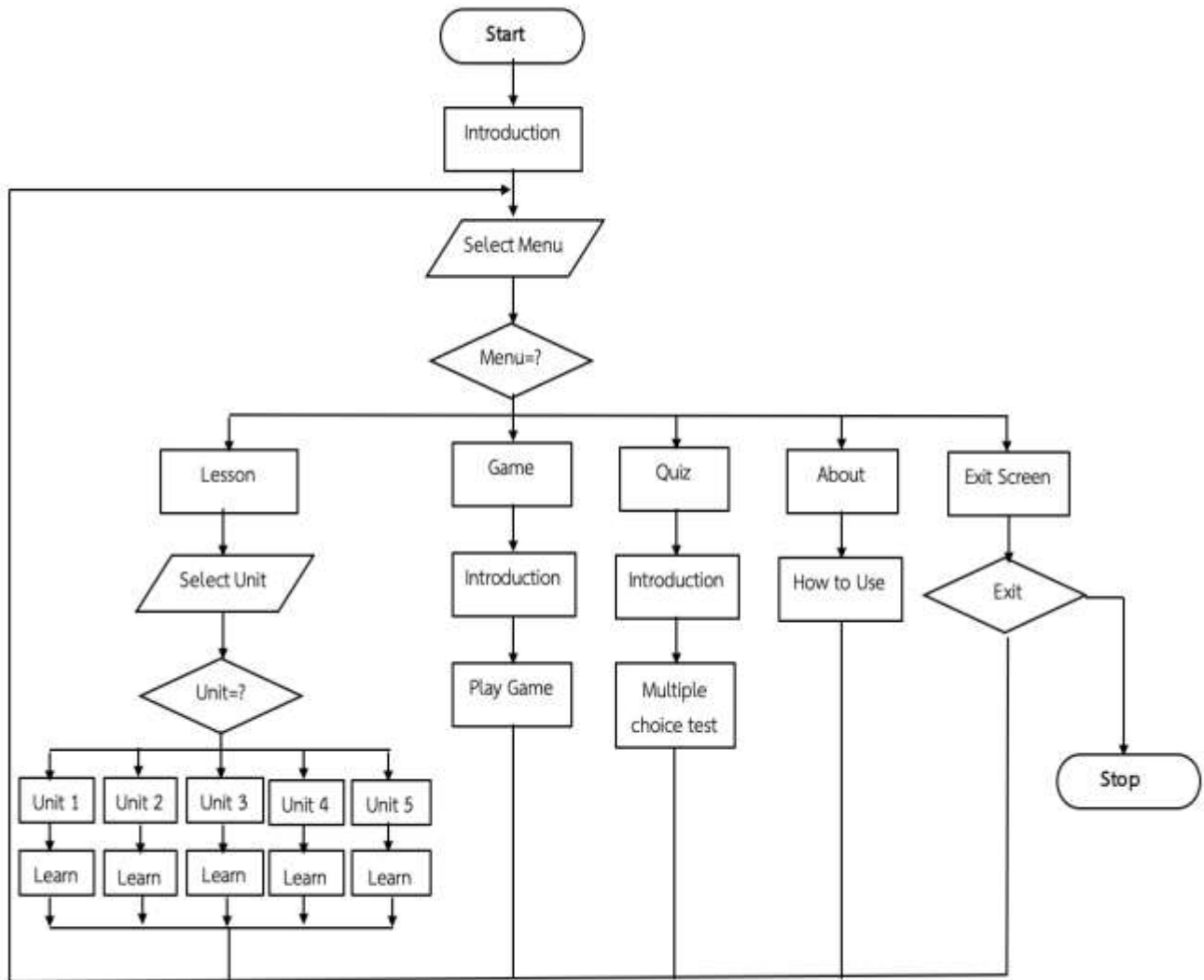


Figure 3: Instructional System Flowchart

IV. Findings

Table 3 shows the results of the pupils’ improvement after learning with the mobile app, with a significant difference in condition: $t=16.813$, $p=.000$.

Table 3: The Comparison Results of Pre- and Post-Tests of Pupils Who Learned Thai Language Using the Mobile App

	Score of experimental group (n=90)		t	p
	Pre-test	Post-test		
Learning outcome	25.13 (13.39)	42.66 (14.26)	16.813*	.000

* $p < 0.05$

Table 4 shows the results of the satisfaction level of the school teachers, pupils’ parents and pupils on the use of the mobile app. According to the following Table 3, school teachers’ satisfaction level was at a very high level ($\bar{x}=4.51$, S.D. = 0.34). For the pupils’ parents, the satisfaction level was high ($\bar{x}= 4.44$, S.D. = 0.32). This satisfaction level was also considered to be high in the pupils’ result.

Table 4: Shows Mean and Standard Deviation of the Satisfaction Level of the Participants Regarding the Use of the Mobile App for Thai Language Learning

	Teachers		Parents		Pupils	
	(\bar{X})	(S.D.)	(\bar{X})	(S.D.)	(\bar{X})	(S.D.)
The course content was clear, concise and easy to understand.	4.52	0.60	4.48	0.60	4.46	0.69
The content delivery was easy to understand.	4.44	0.60	4.49	0.54	4.43	0.68
The narration and the music were appropriate.	4.42	0.56	4.34	0.63	4.51	0.62
The font type was suitable for the app.	4.46	0.56	4.37	0.66	4.48	0.60
The meaning of used images and animated pictures got across and attractive.	4.47	0.62	4.48	0.64	4.52	0.56
The form of review lessons (i.e. games and quizzes) was impressive.	4.54	0.60	4.37	0.81	4.42	0.61
The app design was interesting-looking.	4.58	0.54	4.43	0.67	4.47	0.60
The app was user-friendly.	4.53	0.60	4.50	0.65	4.46	0.65
Pupils were able to use the app independently.	4.52	0.56	4.42	0.58	4.46	0.58
After the use of the app, it helped pupils know Thai intonation marks better.	4.59	0.59	4.56	0.56	4.63	0.52
	4.51	0.34	4.44	0.32	4.45	0.39

The following are the overall comments and further suggestions which some respondents made.

1. The app was easy to understand;
2. the app increased learners’ enthusiasm in which learners were able to use it independently;
3. the app should have other Thai course contents such as compound words;
4. games and quizzes should come with answers; and
5. games helped learners enjoy the lesson in which the developer should create more games and add them to the app.

V. Discussion

The study result showed a significant improvement in the pupils’ Thai language learning after the use of the app. It also affirmed that using a mobile app can be the right choice for learning languages in which it could also be used as a learning resource both in and outside of the classrooms. The app further enhances learner achievement in learning languages [9]. The findings showed that different participants generally were contented with the app for Thai language learning (very high for the school teachers and high for the pupils and their parents). Overall, the participants felt that the mobile app made a positive impact on study habits of learners, strengthening motivation and supporting active learning. These results indicated the importance of providing language learners with resources to help them learn the language more effectively.

Furthermore, the results also showed that the participants had strong and positive viewpoints about the use of mobile technology in language learning [4]. Within the 21st century, learning technologies have increasingly appeared to be widespread within various kinds of learning environments [10]. This study supports the trend in the adoption of learning technologies into learning to improve individuals, societies and cultures.

Indeed, MALL is considered to be legitimate in the areas of language learning. It has attracted vast audiences, including learners and researchers. However, it is worth to mention that some factors such as physicality, pedagogy and psychology-related or society-related issues indicate the success in implementing MALL to learners, teachers, and parents. Therefore, the MALL principles, as mentioned in the literature, would be beneficial to anyone who uses mobile devices for their language learning. In particular, integrating mobile learning with language education can also be helpful for students [3]. We suggest that further research be carried out that more convincing results can be achieved. For example, future studies can employ in-depth interviews to investigate the effects of multimedia learning.

VI. Conclusion

The results of the study showed how the app assisted the pupils in learning and reflected their principal understanding of Thai intonation marks. A good multimedia design which features the meaningful animations could reduce a cognitive load enabling to improve pupils' performance. The mobile app supported pupils' learning, particularly language learning abilities. Based on the satisfaction level of the users, the mobile app was claimed to create learning atmospheres which increase motivation, curiosity and stimulation of learning. For instance, the practice mode on the app was well aligned with the educational games. However, mobile apps are still limited to learners due to the availability and accessibility in some schools and home settings within the three Southern border provinces, Thailand. Finally, this mobile app produced a positive learning outcome. It was also confirmed that learning through mobile phones can be served as an alternative way for different types of course delivery.

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References

- [1] H. Jiangning, F. Xiao, L. Hongyan, L. Xindan. Mobile App Recommendation: An Involvement-Enhanced Approach, *MIS Quarterly*, vol.43, no.3, pp. 827-849, 2019.
- [2] A. Stathopoulou, Z. Karabatzaki, D.Tsiros. Mobile Apps the Educational Solution for Autistic Students in Secondary Education, *International Journal of Interactive Mobile Technologies*, vol.13, no.2, pp. 89-101, 2019.
- [3] G. Stockwell, P. Hubbard. Some emerging principles for mobile-assisted language learning, *The International Research Foundation for English Language Education*, pp. 1-15, 2013. Online available: <http://www.tirfonline.org/english-in-the-workforce/mobile-assisted-language-learning/>
- [4] F. D. Deris, N. S. A. Shukor. Vocabulary Learning Through Mobile Apps: A Phenomenological Inquiry of Student Acceptance and Desired Apps Features, *International Journal of Interactive Mobile Technologies*, vol.13, no. 7, pp. 129-140, 2019.
- [5] E. M. Luef, B. Ghebru, L. Ilon. Language Proficiency and Smartphone-aided Second Language Learning: A look at English, German, Swahili, Hausa and Zulu, *The Electronic Journal of e-Learning*, vol.17. no.1, pp. 25-37, 2019.
- [6] M. Amer. Language Learners' Usage of a Mobile Learning Application for Learning Idioms and Collocations, *The Computer Assisted Language Instruction Consortium*, vol.31, no.3, pp. 285-302, 2014.
- [7] S. Thongmark, W. Neimted, R. Choosuwan, R. Sittichai. Looking Backwards and Forwards of Educational Quality in Three Southern Border Provinces of Thailand, *Princess of Narathiwat University Journal of Humanities and Social Sciences*, vol.5, pp.186-198, 2018.
- [8] E. Zsiga, R. Nitisaroj. Tone Features, Tone Perception, and Peak Alignment in Thai, *Language and Speech Journal*, vol.50, no.3, pp. 343-383, 2007.
- [9] I. Damyanov, N. Tsankov. Mobile Apps in Daily Learning Activities, *International Journal of Interactive Mobile Technologies*, vol.12, no. 6, pp. 133-140, 2007.
- [10] T. Trust, R. W. Maloy. Why 3D Print? The 21st Century Skills Students Develop While Engaging in 3D Printing Project, *Computers in Schools*, vol.34, no.4, pp. 253-266, 2017.