Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 6): pp. 1163-1171
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.06.123

# The Use Of Augmented Reality Book To Enhance Writing Skill Of Primary School Students using Thai As A Second Language

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**Abstract**. This research was conducted to 1) develop augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade students using Thai as a secondlanguage,
2) examine the effectiveness of the AR book usage, and 3) explore the students' satisfaction of the AR book. The samples included 64 first-grade students of Demonstration School Prince of Songkla University (Primary). They were divided into an experimental group of 35 students and a controlled group of 34 students. The instruments covered 1) AR book for the writing practice of Thai alphabets and numbers of the first-grade students, 2) AR learning lesson plan, 3) traditional learning lesson plan, 4) achievement test on Thai alphabets and numbers writing, and 5) satisfaction questionnaire towards the AR book usage. Mean, standard deviation and t-test were employed in data analysis. The research findings were as follows. 1) The quality and effectiveness of the AR book was at a high level (mean = 4.79, SD = 0.28) with efficiency at 82.25/81.85. 2) The achievement test score of the experimental group (mean = 82.14, SD = 4.14) was higher than that of the controlled group (mean = 75.47, SD = 5.62) at a significant level of .01. 3) The students' satisfaction towards the AR book was at the highest level (mean = 4.52, SD of 0.65).

**Keywords:** Thai alphabets, Thai numbers, Augmented Reality, Augmented Reality Book, Thai alphabets and Thai numbers writing ability, Satisfaction,Primary education

## INTRODUCTION

The Thai language is a national identity and precious cultural heritage of Thailand. It is regarded as a powerful tool of communication that helps foster unity and peace and also a crucial medium in searching and gathering a bunch of information that broadens vision and enhances creative thinking, analysis, and criticism.

Writing is an essential form of communication that utilizes symbols or letters in expressing individual needs and opinions. It is a means that strengthens human intellect and a mode of communication that lasts longer than other skills like speaking which is easily forgotten (WanneeSomprayoon, 1994; RatkandaLaokaew, 2007).

Realizing that the Thai language is important, the Ministry of Education categorizes the Thai language as a compulsory subject according to the 1978 Prathomsuksa I Curriculum (Revised Edition 1990) so as to enhance students' knowledge, ability, and accuracy in the use of Thai language on the basis of different ages and potential. Despite the aforementioned policy, there exist some problems of the language use among the first level-primary education students. For example, most students lack the interest and responsibility in studying and doing assignments. Some fourth-grade students have poor reading and writing skills which results in low learning achievement. This is possibly due to inappropriate classroom environment. (Department of Academic Affairs, 1992 quoted in PitsamaiPromchot, 2005)

The three southern border provinces of Thailand are unique in their religion, language, and culture. Most people are Muslims who use Melayu in their daily communication. This obstructs and limits them from their Thai language enhancement. Based on the learning achievement data, 33.72% of the third-grade students in the three southern border provinces are incapable of reading and writing. Regarding Ordinary National Educational Test (O-NET) of the sixth-grade students in 2011, of all five core subjects, the average scores of the three southern border provinces students are lower than the national mean. The Thai language subject average score nationwide is 41.88, while 36.78 is the average result of students in both government and private schools in the three southern border provinces (NasuerohCheha and PakonPhuengnet, 2012).

According to the Basic Education Curriculum 2008, the instruction of the Thai language for the first-grade students (the first level-primary education) aims to enhance students' reading, writing, listening, and speaking abilities. To accomplish the goal, practice is a primary concern. Students must be introduced to the Thai alphabets and consonants and trained to read and write accurately at the first stage. However, in actual practice, instructional activities do not effectively work as reflected through students' dissatisfying learning achievement especially of the first-grade students whose poor reading and writing ability affects their Thai language learning. Learning materials are therefore essential in motivating and drawing attention of the students who probably feel inattentive to the lecture-based instruction which influences their learning outcome (PawineeKlinlokai and YaowapaPrakongsilpa, 2010).

In this digital era, computer technology plays a vital role in education. Augmented Reality or AR is one popular technique that can be integrated with various forms of printed media, accessible via the Internet, and connected to other gadgets like GPS. (NattayaNakasan, 2010). To NonglakMeekaew et al (2014), the use of AR will make the classroom more attractive and call greater participation from the students. AR is a self-study material that can be independently used by a single learner or in a group. Fascinating features of AR increases students' positive attitudes towards their lessons and textbooks. JantakanSathapornwachana and SakonMuangsun (2014) compared learning achievement of the students taught by textbook with AR technology of 3D on illustration and those treated with traditional textbook and discovered that learning achievement of the first group is higher than that of the latter. To the students, AR is more motivating and comprehensible since they can learn from both illustrations and videos.

Based on the above reasons, this study is therefore conducted. The development of augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade students using Thai as a second language as well as the examination of its

effectiveness will benefit the Thai language learning and solve the reading and writing problems of the students in the long run.

**OBJECTIVES**

1. To develop augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language.

2. To examine the effectiveness of the augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language.

3. To explore the students' satisfaction of the augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language.

**RESEARCH LIMITATION**

**1. Population and Samples**

1.1 The population in this study included 134,850Primary School Students in three southern border provinces of Thailand (Office of the Basic Education, 2019).

1.2 The samples covered 64 first-grade students of Demonstration School Prince of Songkla University (Primary), who were divided into an experimental group of 35 students and a controlled group of 34 students.

**2. Variables**

2.1 Dependent variables were Thai alphabets and numbers writing skillof the first-grade students and students' satisfaction.

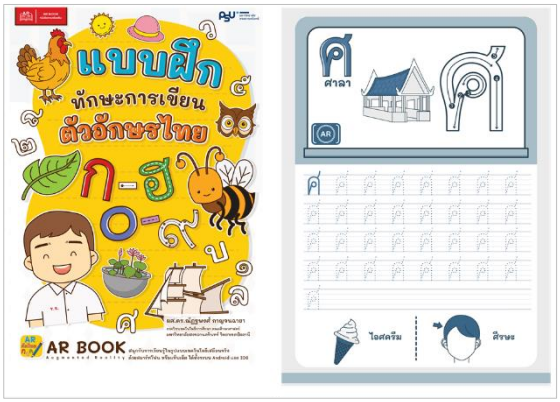
2.2 Independent variables referred to the augmented reality book to enhance writing skill of Thai alphabets and numbers

**RESEARCH INSTRUMENTS**

1. Quality evaluation form of augmented reality book to enhance writing skill of Thai alphabets and numbers of the first-grade studentsusing Thai as a second language.

2. Augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language were the highest quality (mean = 4.79, SD = 0.28)

**Fig. 1**. Design of augmented reality book to enhance writing skill of Thai alphabets and numbers of the first-grade studentsusing Thai as a second language.




3. Lesson plansof augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language were the highestquality(mean = 4.73, SD = 0.39) and IOC between 0.66-1.00

4. Traditional lesson plan with the highestquality(mean = 4.62, SD = 0.31) and IOC between 0.66-1.00

5. Learning achievement test on Thai alphabets and numbers writing with IOC between 0.66-1.00, reliability at 0.956, item difficulty between 0.20-0.80, and item discrimination > 0.20

6. Satisfaction questionnaire towards augmented reality book to enhance writing skill of Thai alphabets and numbers of the first-grade studentsusing Thai as a second language with IOC between 0.66-1.00

## RESEARCH METHODOLIGY

The research conduction started with literature review and an AR book learning and traditional learning lesson plans which were evaluated by the experts and revised by the researcher accordingly. Learning achievement test was developed and examined for IOC which ranged between 0.66-1.00 and was tried out with 18 first-grade students at PrachauthitBaankokmuang School, Pattani and received reliability at 0.956, item difficulty between 0.20-0.80, and item discrimination over 0.20. The AR book was developed following the 5 stages of learning material development process. 1) The analysis stage aimed to analyze research samples, objectives, and content. 2) The design stage aimed to create animation markers which were content-related and outstanding with clear and unique composition. At this stage the AR book and content-related animated videos were also designed. 3) The development stage was carried out to develop the designed AR book and animated videos through the use of Unity program. 4) The experiment stage aimed at the trial of the AR book by the students who were not the samples of this research. 5) The evaluation stage aimed at the quality assessment by the experts and the efficiency evaluation by 15 first-grade students at Banramong, Mueang district, Pattani province. The results revealed the quality and the efficiency scores at 4.79 and (E1/E2) equal to 82.25/81.85 orderly. After the revision and improvement of the assessed AR book, a satisfaction questionnaire was developed and tested for IOC that ranged between 0.66-1.00. After that 2 types of lesson plans for 7 hours had been developed 1. Lesson plans of augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade students using Thai as a second language and 2. Traditional lesson plan. Theywere evaluated the quality by experts in the highest level (mean = 4.73, SD = 0.39) and (mean = 4.62, SD = 0.31) as follow.

The complete instruments were implemented with the samples covering 64 primary school students of Demonstration School Prince of Songkla University (Primary), who were

divided into an experimental group of 35 students and a controlled group of 34 students. The results were summarized, analyzed, and discussed at the last stage.

**DATA ANALYSIS**

The statistics used in this research were mean, standard deviation and t-test.

**FINDINGS**

**1. The results of the AR book development**

**Table 1** Quality assessment of the AR book by the experts

| Items | M | S.D. | Quality |
|---|---|---|---|
| Layoutand design of AR Book | 4.79 | 0.32 | Excellent |
| Sounds and Pictures of AR book | 4.73 | 0.29 | Excellent |
| Usage of AR book | 4.85 | 0.19 | Excellent |
| **Overall quality** | **4.79** | **0.28** | **Excellent** |

From Table 1, the experts evaluate quality of AR book layout and design of AR book result was excellent (mean = 4.79, SD = 0.32)Sounds and Pictures of AR book was excellent (mean = 4.73, SD = 0.29) and Usage of AR book was excellent (mean = 4.85, SD = 0.19).The overall quality assessment result was excellent (mean = 4.79, SD = 0.28).

**Table 2** Efficiency assessment of the AR book by the first-grade students

| Test | Efficiency | Criteria |
|---|---|---|
| During the lessons (E1) | 82.25 | 80 |
| Posttest (E2) | 81.85 | 80 |

From Table 2 indicated that the efficiency score of the AR book during the lesson was 82.25 while 81.85 was the score of the posttest, which was above the set criteria at 80/80.

**2. The results of the AR book usage**

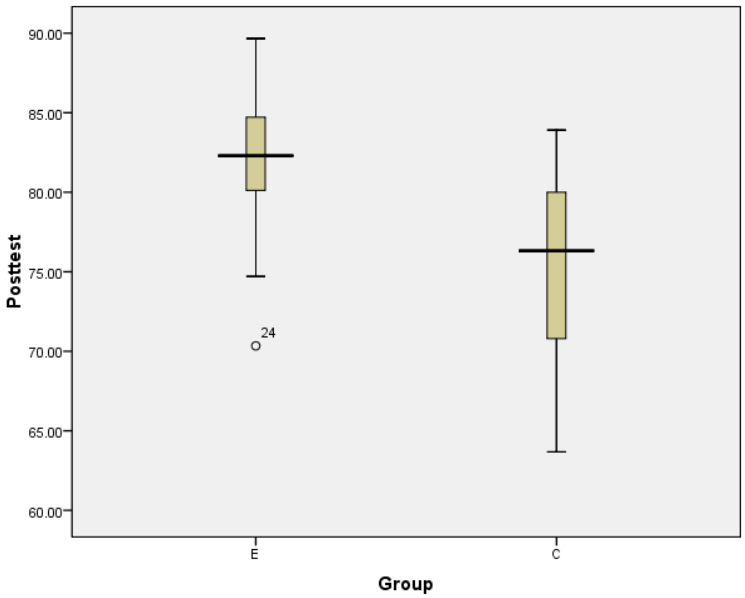
**Table 3** Comparative posttest scores between the controlled and the experimental group

| Variable | Experimental | | Controlled | | t(60.66) | p | Cohen's d |
|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | | | |
| Thai alphabets and numbers writing skill | 82.14 | 4.14 | 75.47 | 5.62 | 5.623 | <.001 | 1.12 |

Note. Levene's test for equality of variances was significant, F = 4.68, p<.001.

From Table 3, the score of the experimental group was significantly higher than that of the controlled group, t (60.66) = 5.623, p< .001. The average score of the experimental group was 82.14 (SD = 4.14) while that of the controlled group was 75.47 (SD = 5.62). The effect size equaled 1.12 which was above 1 SD. Even though the test violated the preliminary agreement regarding the homogeneity of variance between two groups, it can be concluded that the AR book increased the Thai alphabets and numbers writing skill as shown in Diagram 1.

**Diagram 1**Comparative writing skill between the experimental group (E) and the controlled group (C)



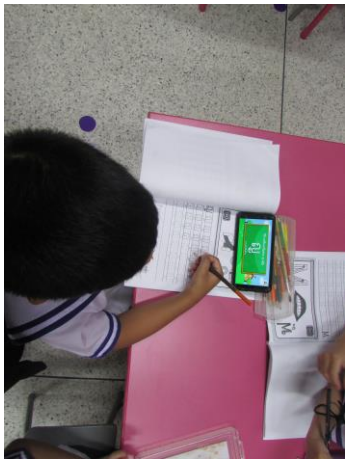

### 3. Students' satisfaction of the AR book

**Table 4** The students in experimental group's satisfaction of the AR book

| Items | M | SD | Quality |
|---|---|---|---|
| Layoutand design of AR book | 4.57 | 0.60 | Most satisfied |
| Contentof AR Book | 4.54 | 0.59 | Most satisfied |
| Usage of AR Book | 4.45 | 0.73 | Highly satisfied |
| **Overall satisfaction** | **4.52** | **0.65** | **Most satisfied** |

From Table 4 illustrated Students' satisfaction of the augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second languagein layout and design of AR book wasmost satisfied level of satisfaction(mean = 4.57, SD = 0.60) content of AR Book wasmost satisfied level of satisfaction (mean = 4.54, SD = 0.59) and usage of AR Book washighly satisfied level of satisfaction(mean = 4.45, SD = 0.73)The overall result wasmost satisfied level of satisfaction(mean = 4.52, SD = 0.65).

**Fig.2.** Implementation of augmented reality book to enhance writing skill of Thai alphabets and numbers writing of the first-grade studentsusing Thai as a second language



**DISCUSSION**

1.The study revealed the excellent level of quality and effectiveness of the Augmented Reality Book to Enhance Writing Skill of Thai alphabets and numbers writing of Primary School Students Using Thai as a Second Language (mean = 4.79, SD = 0.28). The efficiency level at 82.25/81.85 was above the set criteria at 80/80. Due to the systematic development by ADDIE Model, The process included learners and content analysis, the AR book design, and the flowchart writing. Develop multimedia and were also utilized and assessed by the experts and improved by the researcher accordingly before the trail for efficiency. As stated by PiyamartKaewcharoen and WarisaraTeeratunpiyasuporn, (2016) that instructional system design and development of instructional media through the process of learner analysis, content analysis, expected learning outcomes as curriculum content, design, write workflows and work plans to determine the content presentation. That is under auditing of content experts, measurement and evaluation expert, and instructional media expert. According to the experts' suggestion, researchers developed the instructional media more effective and to be used for teaching and learning very well

2. The posttest result of the students treated with the AR book was higher than that of the controlled group at a significant level of .01. Mean and standard deviation of the experimental groups were 82.14 and 4.14 respectively, while those of the controlled group were 75.47 and 5.62. The achievement proved the effectiveness of the AR book which motivated the students to learn because of its beautiful design, and captivating illustrations and animations and easy access via computers, smart phones, projectors or other display devices. In addition, the AR book also encouraged autonomous study as stated by DusitKhawlueang and AbhichatAnukulwech (2018) that AR technology is a guideline for developing the learning process that enhanced (1) learning behavior and critical thinking and problem-solving to the learners; (2) Communication skill through seeing, hearing, and touching during their study; (3) Solving the problem by transferred the abstract to be concrete; and (4) created new learning environment for understanding the lessons. And also corresponds to SomsakTechakosit and PallopPiriyasurawong (2015) said that the AR technology was compatible with the learning environment in the 21st century; to be used by both an individual and a group to improve students' learning achievement; motivation, stimulating and open new learning experience to new learning environment to improve students' learning achievement,

3. The students' satisfaction of the AR book was at the highest level (mean = 4.52, SD = 0.65). To the students, the AR book was motivating and attractive to learn. They were excited to use a new technology in studying. The content and the animations made the learning entertaining and increased their understanding of the lessons at the same time. According to

GawaleePatai et al (2018), using the AR technology, the students had the options to see 3D models of objects that created joyful learning and increased their ability to memorize and understanding. The idea was similar to that of PotsirinLimpinan (2017), who mentioned that the excitement and fun of the AR technology encouraged student interaction. Learning atmosphere as stated by PatcharinBoonsomthop (2019) also influenced students' learning attitudes. A classroom treated with the AR technology seemed to grab more attention of the students since they felt independent and relaxed to learn without worrying about their individual capacity.

## SUGGESTIONS

### 1. Suggestions for implementation

Effective use of augmented reality book to enhance writing skill of Thai alphabets and numbers of the first-grade students using Thai as a second language, teachers should offer the AR book as remedial learning and take the instructional design to conduct the AR book to enhance language skill

### 2. Suggestions for further research

2.1 Teacher could research the AR book to enhance reading listening and speaking skill

2.2 Teacher could study learning retention the AR book to enhance writing skill of
Thai alphabets and numbers of the first-grade students using Thai as a second language,

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