



## Development of Conquer of the Land of ASEAN Application to Enhance Knowledge on ASEAN Community for Early Childhood.

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### Article info

#### Article history:

Received : 1 October 2018

Revised : 25 March 2019

Accepted : 7 May 2019

#### Keywords:

Application, ASEAN,  
Early Childhood

### Abstract

The objectives of this research were 1) to develop a game-based learning application “Conquer of the Land of ASEAN” to educate early childhood students with knowledge on ASEAN Community; 2) to compare the knowledge of the early childhood students on ASEAN Community before and after the use of Conquer of the Land of ASEAN Application. The sample group consisted of 19 early childhood students of Kindergarten III, aged between 5-6 years, from La-orutis Demonstration School, Bangkok; obtained through simple random sampling technique. The trial period lasted for 6 weeks; 60 minutes a day, one day per week, in total of 12 periods. Research tools were Conquer of the Land of ASEAN Application, and placement test on knowledge of ASEAN Community of the samplers. The data were analyzed by mean, standard deviation, and t-test. The results of the study found that 1) The “Conquer of the Land of ASEAN” Application's evaluation was conducted to test the application performance on its function and quality. The result by the application experts indicates that the quality of the application is at a Very Good level in general ( $\bar{X}$  = 4.42, S.D. = 0.41). 2) The early childhood student who had used Conquer of the Land of ASEAN Application had better knowledge about ASEAN Community than before trying this application. After comparing average scores obtained from the pre-test and post-test on knowledge on ASEAN Community conducted by early childhood students, the result demonstrated the post-test score higher than pre-test score, statistically significant at the 0.05 level.

### Introduction

Currently, young children grow up in a world full of Information Technology. The electrical and digital devices that are used for early childhood education as a method to deliver information nowadays are televisions, computers, smart mobile phones, tablets, and video

players, etc. Information Technology is integrated into the educational process as a key towards enhancing developmental skills for early childhood education in the 21<sup>st</sup> century. The abilities on the science and technology would make children understand the cultural diversity, be creativity, and have quality output and It also would makes the children be the rational person and able to

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communicate (Sanrattana, 2013) as well as Cate (2014) who noted that exposure in early childhood to technology allows for opportunities to learn how to solve problems. The American proficient institute in early childhood (The American Academy of Pediatrics, 2011) suggested

parents should not let children use technological devices with a monitor when they are less than two years old; while children at the age of three or older are able to control and could use technological devices to develop their social and language skills and also prepare themselves for school entry qualification. Parents and teachers who teach early childhood have to learn and study the use of the technology devices to support children's learning development and enable young children to use the devices properly and happily in the innovation age.

Technological teaching materials had been various for early childhood education and the research which studied the technological behavior and outcome of early childhood, for example the study of O'Hara (2008) found that the use of technological teaching materials would help children to socialize better and support their creativity and learning proficiency. As well as, the research of Morrow (2011) found that the suitable computer usage in early childhood would also affect the children's literacy. Moreover, the research of Schmid, Miodrag & Di Francesco (2008) showed that to use the technology for teaching would increasingly stimulate and motivate the children more than those who did not use it. However, Van, Ellis & Railsback (2001) said that the consideration of technological use to children was depended on how to choose the material and software processes. The suitable teaching materials are deemed to assist the students to reach opportunities and gives support to create their imagination and solve problems by their own. It said that software programs can support the children to create their output and could interact in forming their answers, furthermore, it attracts children to use in their activities. The key point of using technological material is for children's interaction that conforms to the research of National Association for Education of Young Children: National Association for the Education of Young Children (1996) in that the program is designed to support the early childhood efficiently, and conforms to the learning process and children development. It is integrated into the curriculum and instruction and it also is used in combination with other educational media. The technology that has been supporting early childhood education is called

Edutainment, a combination of two words: education and entertainment. The children receive both knowledge and enjoyment, with the key objective to produce a software program for early childhood as not only emphasizing the contents of learning but also should be enjoyable. The specification of proper multimedia is that it has more components, such as, text, image, animation, and sound. In the cases of using multimedia a computer is necessary (Morrison, 2004) however, the facilitators who instruct the children both at home and school should realize and consider the multimedia program should respond and support the children to learn following their nature. The highest achievement of using digital tools to instruct small children is to use a program or series properly. It said that the program has to support the children to create their output, able to respond, answer in variety of questions, analyze thinking, and conduct searches. Moreover, it should attract the children's interests and participates in children's activities and most importantly the program should reinforce the interaction between learner and instructor (Lokutarapol, 2013).

Thailand became a member of the Association of South East Asian Nations ("ASEAN") in 2015 in order to transfer its goods, services, investments, and skilled workers freely. As an ASEAN member, Thailand supports Thai people to gain knowledge and to understand the background of its neighbor countries economic, social, and culture, such as, customs, cultures, foods, greetings, and attractive places etc. There are three pillars of the ASEAN; 1) ASEAN Political-Security Community: APSC, 2) ASEAN Economic Community: AEC, 3) ASEAN Socio-Cultural Community: ASCC. The early childhood education is the first fundamental level which would help children to learn and understand the ASEAN community in general and the desirable characteristics for being Thai children in The ASEAN community. The ASEAN community instruction in general for early childhood could be organized in various assesses. Even though, the academies which had their own philosophy, principle, and approach in instruction which was integrated the ASEAN knowledge in curriculum, improved the learning contents, organized the resource units and learning activities appropriately. The skills of preparation for learning and living in the variety cultures from other countries, including Thai cultural expression ability to others, we could keep the Thai national identities and be being Thai gratefully (Bhulpat, 2014).

From the reasons mentioned above, the researchers developed the Conquer of the Land of ASEAN Application to prepare the readiness of early childhood on learning and understanding of ASEAN community by a two-dimensional game: 2D game. The application is easily access with a personal computer and Android Smartphone and has the multimedia system: text, image, sound, animation, authentic situation and reaction. The development of the application supports the Active Learning approach and is also integrated to the instruction. The contents of this application is attached to the knowledge of ASEAN community for early childhood, for example, national flags, foods, costumes, greetings, and attractive places etc., moreover, it is able to test and revise the children by engaging in games. There are three games in this application: Shadowed Image Matching, Food and National Flag Matching, and Dressing Matching Game and also a placement test on knowledge of ASEAN community. The application functions as an offline system. The learners are able to study and practice by their own and receive the knowledge or *Edutainment* any place and/or time. The students are preparing to engage and become a member of the ASEAN community.

## Objectives

1. To develop a game-based learning application “Conquer of the Land of ASEAN” to provide knowledge on ASEAN Community for early childhood using Android smartphones and personal computers.
2. To compare the knowledge of the early childhood participants on ASEAN Community before and after the use of Conquer of the Land of ASEAN Application.

## Conceptual framework

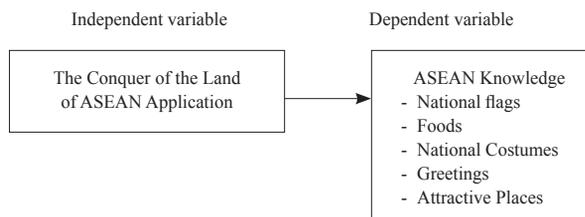


Figure 1 Conceptual framework

## Research Methodology

### 1. Populations and Samples

The research populations were male-female early childhood students, aged between 5-6 years old, studying in Kindergarten III in the first semester and 2017 academic year of the La-orutis Demonstration School, Bangkok, 6 classrooms with 20-22 persons per classroom, students in total 130 persons.

The research samples included male-female early childhood, aged between 5-6 years old, studying in Kindergarten III in the first semester and 2017 academic year of the La-orutis Demonstration School, Bangkok, 1 classroom with 19 students by simple random sampling technique.

### 2. Research Instruments

The research instruments were divided:

2.1 The Conquer of the Land of ASEAN Application had the following procedures:

1) To study the approaches, theories, papers, and related research about the application development and to interview the early childhood educational experts to design the application and create the contents to motivate the students.

2) To design and create two-dimension images, for example, attractive places, ASEAN foods, male-female main character dressing on national costume in ASEAN.

3) To design the contents of application both Thai and English language and to review the language accuracy by linguistic experts.

4) To develop the Conquer of the Land of ASEAN Application which was written by Action Script 3.0 language, to test the system: the responsive, and data processing, and to search the quality of the application by three experts of the contents considering the suitability of contents, Thai-English linguistics, data processing, and application composition e.g. monitoring, text, background, and image and to improve the application following the expert recommendations.

5) To create the questionnaire on the quality of the Conquer of the Land of ASEAN application which has a rating scale at 5 levels that are divided: Very low, Low, Moderate, More, and Most and to verify the content validity by three experts considering its suitability, language accuracy, and the congruence of the objectives and to select the question which had the index of congruence: IOC at 0.5 upward.

6) To evaluate the quality of the Conquer

of the Land of ASEAN application and to edit the application following the experts of content recommendation and to present its application to other three experts of application to consider the quality questionnaire. There were three subjects of the questionnaire: the content, design and format, and advantage of application usage.

7) To improve the Conquer of the Land of ASEAN application following the recommendation of experts of application, for instance, to record voice in the studio, to match the button and image by each game should have directions on how to play game.

2.2 The placement test on ASEAN community had the research procedure and instrument quality containing the following :

1) To study the approaches, theories, papers, and related research of placement test creation.

2) To create the placement test on ASEAN community for early childhood. The contents were: national flags, foods, dressings, greetings, and attractive places which has the image format with 3 choices, and 20 items.

3) To search the quality of the placement test on ASEAN community by three experts of content, and to evaluate the congruence of the question, content validity, language accuracy, and research objective. The question must have the index of congruence: IOC at 0.5 upward.

4) To improve the placement test on ASEAN community following the experts suggestions of content recommendation and to edit the narrative its test in every item from "choice 1, choice 2" to be the name of fruits, such as, banana and orange and to put the test in the Conquer of the Land of ASEAN application and to create the program processing of the placement test as an animation function.

### 3. Data collection

This research was conducted as an experimental research in the quasi experimental design format and was tested by one group sample. Its data was collected from an authentic situation while testing the suitability and congruence of the objectives and evaluated by a pre-test and post-test of the placement test on ASEAN community.

The research was conducted on the research sample in the first semester, 2017 academic year since July 25 to August 29, 2017. The period lasted for 6 weeks; One day per week on Tuesday during 9.00-10.00 a.m and spent 60 minutes per day, in total 12 periods. The research procedure is as follows:

1) To introduce the Conquer of the Land of ASEAN application to the samples.

2) To conduct the pre-test of the placement test on ASEAN community to the samples.

3) To test the samples by using the Conquer of the Land of ASEAN application. The procedures of testing were:

3.1) A collaborative approach was conducted by the teachers demonstrating how to use the Conquer of the Land of ASEAN application by using students to be representatives to assist controlling computer mouse and assessing its application. The teachers motivated students to answer the questions and show the opinions.

3.2) When the students had already learnt about national flags, foods, national costumes, greetings, and attractive places of each country, the students did the placement test to revise their learning in the 2D games which had three games: Shadowed Image Matching, Food and National Flag Matching, and Dressing Game.

3.3) Students are moved to a personal computer, the teachers and teaching assistants motivated and appreciated students when they had done the game successfully, and observed the learning behavior of the students. The teachers and teaching assistants would pay the students attention closely in order to assist or advice.

3.4) Students performed the placement test and raised hands when finished. The teachers and teaching assistants rechecked the test.

3.5) Students shared and summarized their learning in front of the classroom, teachers asked students questions and let them choose the next ASEAN neighbor country that would learn next week.

4) Students took the post-test after finishing the Conquer of the Land of ASEAN application. The post-test was the same as the pretest.

### 4. Data analysis

The analysis of the quality of the Conquer of the Land of ASEAN application had 5 criteria levels by doing all questionnaires to find the mean. the criteria definition of the data analysis were: "1.00-1.50" means Very low, "1.51-2.50" means Low, "2.51-3.50" means Moderate, "3.51-4.50" means More, and "4.51-5.00" means Most (Srisa-art, 2017).

The finding of the basic statistic of the Conquer of the Land of ASEAN application used the mean and standard deviation.

The comparison of the knowledge on ASEAN community of early childhood students before and after using the Conquer of the Land of ASEAN application

was compared with the pre-test and post-test score of the samples and the dependent sample T-test was statistically significant at the 0.05 level.

## Results

The research results can be divided into two parts:

### Part 1: The results of the Conquer of the Land of ASEAN application development

The Conquer of the Land of ASEAN application development has 2D graphics: attractive places, ASEAN foods, and the main character of each country and the development of the program processing was written by action script 3.0 language.

The main menu of The Conquer of the Land of ASEAN application was divided into 4 menus: Know ASEAN, the Test, Sample of Game, and About Application menu as shown in figure 2.



Figure 2 Main menu of The Conquer of the Land of ASEAN application

The Know ASEAN menu focused on learning about ASEAN and the 10 member countries of ASEAN. The contents of learning were divided by: national flags, foods, national costumes, greetings, and attractive places. When the users touched the menu, the computer monitor would show the map of ASEAN countries as shown in figure 3.

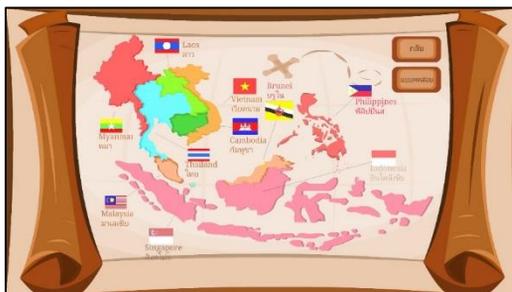


Figure 3 The screen of the ASEAN country map

The users could choose any country they needed by touching the national flag or the country map. The application would be assessed to learn about the selected country as shown in figure 4.



Figure 4 The screen of the know ASEAN

The contents of learning each country had the same format and it was divided into 5 items: (a) Food, (b) National Flag, (c) Greeting, (d) National Costume (e) Attractive places as shown in figure 5.



Figure 5 The screen of each item

When the students learnt all 5 items, they could do the test in game format that applied the multimedia functions, such as, text, image, sound, and animation including the authentic situation and reaction system. The application supports the active learning approach which was integrated between learning and playing. There were three games in the application: Shadowed

Image Matching (a), Food and National flag Matching (b), and Dressing Game (c). When students finished all 3 games, the application would show and record the score (d) as shown in figure 6.

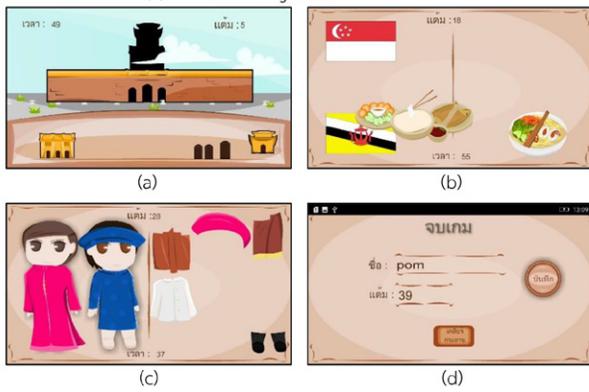


Figure 6 The screen of the test in game format

The test of knowledge on ASEAN Community had 20 items with 3 choices. The students did the pre-test/post-test to compare the understanding on ASEAN community before and after using The Conquer of the Land of ASEAN application. Each item had the question narrative and showed the time of doing test in each item. A sample of the question is shown in figure 7.

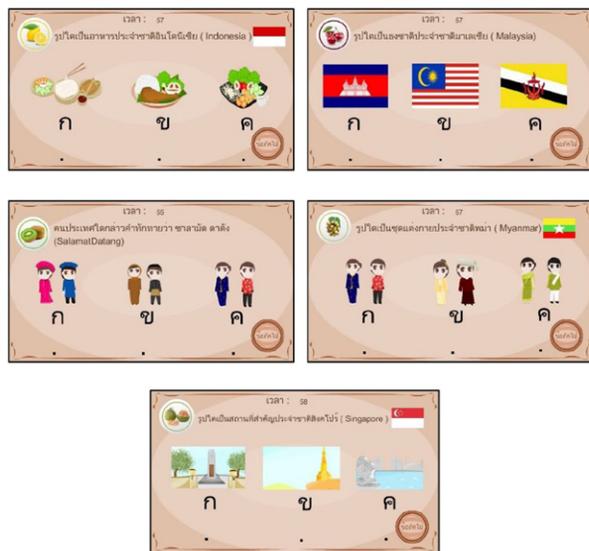


Figure 7 The screen of the sample of the ASEAN community test

When the students finished the test, the application would show the score (a) and if the users touched the recorded button, the application saves the score in the

system which shows the top 4 name lists (b) as shown in figure 8.



Figure 8 The screen of the score and result of ASEAN community test

For the evaluation of the quality of the Conquer of the Land of ASEAN application, each application function was tested by 3 experts. The evaluation of content were divided into 3 parts: the content, design and format, and benefit of application. The evaluation results were shown as the table 1.

Table 1 The mean and standard deviation of the opinion of experts to the quality of the Conquer of the Land of ASEAN application in general

Part	$\bar{X}$	S.D.	Opinion of the quality level
1. Content	4.47	0.50	More
2. Design and format	4.27	0.58	More
3. Benefit of the of application	4.53	0.42	Most
<b>In general</b>	<b>4.42</b>	<b>0.41</b>	<b>More</b>

Based on table 1 it was found that the experts had opinions about the quality of the Conquer of the Land of ASEAN application in general at More level ( $\bar{X} = 4.42$ , S.D. = 0.41) when considering each part the experts had opinions about the quality of Conquer of the Land of ASEAN application in the benefit of the application was the first opinion ( $\bar{X} = 4.53$ , S.D. = 0.42). The Content was next opinion ( $\bar{X} = 4.47$ , S.D. = 0.50), and the third was the design and format ( $\bar{X} = 4.27$  S.D. = 0.58), respectively.

**Part 2: The results of the comparison of the knowledge on ASEAN community of early childhood students before and after using the Conquer of the Land of ASEAN application.**

The comparisons of the knowledge on ASEAN community of early childhood before and after using the Conquer of the Land of ASEAN application was analyzed using the pre-test/post-test score and the comparison result found that the score of the knowledge on ASEAN community of early childhood after using the Conquer of the Land of ASEAN application were higher than before using. The mean score before using the application was 9.47 and the mean score after using application was

12.74. The results of the comparison of the knowledge on ASEAN community of early childhood before and after using the Conquer of the Land of ASEAN application is shown in table 2.

**Table 2** The comparison of the knowledge on ASEAN community of early childhood students before and after using the Conquer of the Land of ASEAN application

Score of the test	n	$\bar{X}$	S.D.	t	P
Before using application	19	9.47	1.58	6.45*	0.00
After using application	19	12.74	2.83		

\*  $P < 0.05$

Based on the data from Table 2 it was found that the mean score of the knowledge on ASEAN community of early childhood students after using the Conquer of the Land of ASEAN application were higher than before using the application. The statistically significant was at the 0.05 level and was summarized that educating early childhood students on ASEAN community with the application allowed students to receive knowledge on ASEAN community are higher than before using its.

The researcher's observation of the early childhood behavior on learning the Conquer of the Land of ASEAN application found that most students were interested in the application. The behavior of the students shown were: to stop fooling around when the application was turned on, to be enthusiastic answering the question and expressing the opinion, to volunteer being a teaching assistant to control the computer mouse and assess the Conquer of the Land of ASEAN application, and be delightful when they learnt with their personal computer. Moreover, the early childhood students also liked the colorful, animated, and sound media and game-base testing. The learning with the Conquer of the Land of ASEAN application in the beginning two weeks, the teachers and teaching assistant must motivate, advise, assist, and teach the students how to use the application, but in the third week, the students had familiarized and remembered how to use the application. The teachers and teaching assistants were able to observe the student's behavior on learning and took care of the students closely in case they needed assistant and advisement.

## Discussion

According to the results, the discussion points are identified as follows:

1. The benefit of the application, the experts had

the opinion on the quality of its benefit at the "Most" level because the application supported the students to have more abilities to use Information Technology and to increase their understanding on ASEAN community members. The application motivated student's learning to have the observation and memorization skills. The research results found that the experts had the opinion on the benefit of application usage in the first rank. It is related to the research of Lokutarapol (2013) and Morrison (2004) that the highest benefit of using the Information Technology to educate early childhood students is for the technologies to support the children to be creative, reflexive, analytical, and rational thinking and attract the students to participate in the activities.

2. The application contents, the experts had the opinion on the quality of its contents at the "More" level because the content presented in the application were accurate, modern, elementary, and interested in and the content conformed to the age of the student. The presentation of content were suitable and sufficient to learn and it related to the research of National Association of Education for Young Children (1996) that the program was designed and produced to efficiently support early childhood students and must conform with the learning process and children's development. The program is easily integrated with the curriculum and instruction and is able to use with other educational medias.

3. The design and format, the experts had the opinion on the quality of its design and format at the "More" level because it was interested in and suitable of composition, design and language format. It was congruent with the research of Schmid, Miodrag & Di Francesco (2008) showing that the technological instruction would increasingly stimulated and motivated the children's interest more than not to use it. The research of Van, Ellis & Railsback (2001) noted that the consideration of the technological usage for children depended on how to choose the materials and software processes. It said that the software of the program must support the children to create their output and interact with their concept. Furthermore, it should be attractive and applied in children's activities, and most importantly it interacts with the children. Moreover, the program relate to the research of Morrison (2004) that the key objectives to produce the program for early childhood not only emphasizes the content of learning but also must be enjoyable. The specification of the program had the proper multimedia which had more components, such as, text, image, animation, and sound. In case of using

the multimedia a computer must be available.

4. The preparations of the knowledge on the ASEAN community for early childhood students by learning through the Conquer of the Land of ASEAN application allowed the students to have more knowledge than before using the application because the application was colorful, animated, and had sound media and the multimedia included text, image, sound, animation, virtual situation and reaction system in the application and also supported the Active Learning approach. The learners could interact with its media and were interested in the application which is related to the research of Schmid, Miodrag & Di Francesco (2008) and National Association of Education for Young Children: NAEYC (1996) that instructions using technology should increasingly stimulated and motivated the children; creating more interest than if they did not use the program. The program designed and produced to efficiently support the early childhood student must conform to learning process and children's development and could be integrated with the curriculum and instruction and also able to use with other educational media. Moreover, the learner takes the test to revise their knowledge in game format which had three games in its application: Shadowed Image Matching, Food and National Flag Matching, and Dressing Game. The learners were able to study and practice on their own. The learning with enjoyment was congruent to the recommendation of Laura Brown Luis (Laura, 2011) who said that to educate early childhood students by the application, the children would receive not only knowledge but also enjoyment while learning and the research of Lokutarapol (2013) referred that the factors that support early children's learning effectively are programs that support the children's learning, and give the student a chance to interact and also develop. The research of Jaroopankaseam, (2015) mentioned that the developmental processing of game-based learning application for early childhood should be interested in and enjoyable. It could be the game that revised the content of learning and assisted the students had chance to participate in the activities thoroughly. The game-based learning approaches in the future, were used in the academic institute. It could be instead supported the instruction by manual game, for example, to let the students play game on the computer or electronic devices. It could be summarized that the early childhood who had used the Conquer of the Land of ASEAN Application were better knowledgeable on ASEAN Community than before using its application.

The result of the comparison on the average scores of the placement test on ASEAN Community obtained from the pre-test and post-test was conducted with early childhood students and the results demonstrated the post-test score was higher than pre-test score, statistically significant at the 0.05 level.

### Suggestions

The suggestions of this research are:

1. The Conquer of the Land of ASEAN application is an educational innovation on Information Technology which supports early childhood education on ASEAN community learning. So, at the first period of using this application, the teachers must demonstrate how to assess it and motivate, suggest, and admire the students. In the case that some students need assistants or advice, the teachers should pay close attention.

2. The instruction of this application should have a teaching assistant to take care of the students thoroughly.

The suggestions for future research are :

1. Should develop the application on IOS operating system.

2. Should educate the comparison of early childhood ability on Information Technology with other impact factors: learnable, searchable, imaginable, and creatable.

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