

The Development of an Application Assisted in Learning English for Communication in the High School Education for Visually-impaired Students in Thailand

¹Kanjana Chanphram, ²Suwaree Yordchim, ³Yothin Sawangdee

⁴Phuwithch Ngiwline, and ⁵Achara Wongsothorn

^{1, 2, 4, 5}Suan Sunandha Rajabhat University, Thailand

³Mahidol University, Thailand

Email: ¹s58584935002@ssru.ac.th, ²suwaree.yo@ssru.ac.th

³yothin.saw@mahidol.ac.th, ⁴phuwithch.ng@ssru.ac.th

Received March 9, 2023; **Revised** May 20, 2023; **Accepted** June 3, 2023

Abstract

There were obstacles to educate visually-impaired students (VIS) principally in learning English since the schools for the blind lacked of teachers, and educational facilities. Hence, the researcher developed the English for the Blind application, to 1) examine the students' English competency; and 2) study the students' satisfaction after using the application. The population was 99 VIS in grades 10 to 12 from 3 schools for the blind, chosen by simple random sampling. This study was quasi-experimental research, conducted from August to December 2021, collected data through baseline and endline surveys, pre- and post-tests, and the English for the Blind application, analyzed data by frequency, mean, standard deviation, and paired-samples t-test, and used the 5-point Likert scale and the score assessment criteria of the Common European Framework of Reference for Languages (CEFR) to interpret the scores.

The findings implied that the students in the experimental group who used the application could increase their English competency up to 3 levels from B1 Intermediate to C2 Proficient, whereas the students in the control group who did not use the application gained one level up. Moreover, the pre- and post-test scores of all students were significantly different. After the first experiment, the control group was let to use the application, and found that their final examination scores to the post-test scores of the previous experimental group was not different, meant that the English competency of VIS in the control group could improve after using the application too.

The overall of the students' satisfaction towards the application was satisfied, mostly with the contents and activities in each lesson which were appropriate for their levels, and the functions that supported their use. For this reason, the results indicated that the English for the Blind application was efficient and could develop the students' English communication skills.

Keywords: Application; English for communication; High school education; Visually-impaired students; Thailand

Introduction

English is considered as one of the most important languages in the world, and the third largest language by number of native speakers, after Mandarin and Spanish (Eberhard et al., 2023). For this reason, the Ministry of Education has recognized the importance of this matter and tries to reform Thai education systems with a better quality and standardization. In the Basic Education Core Curriculum (A.D 2008) displays that English is significant and must be taught to students in every school. Moreover, there are specific learning contents of English which are divided into 4 main strands belong to learning standards of The Basic Education Core Curriculum (2008). However, for numbers of high school students in the formal school system in Thailand, 188,598 are students with disabilities (Department of Empowerment of Persons with Disabilities, 2017) who have limitations in doing some activities in daily life due to disabilities (Education Provision for Persons with Disabilities Act, 2008). From this issue, the Ministry of Education focuses on the provision of education for persons with disabilities to develop their knowledge and abilities to make a career and have self-reliance.

Anyhow, the office of the basic education commission or OBEC (2017) admitted that there are many obstacles and weaknesses in their operations; for instance, lack of special education teachers in some specific departments, the facilities are not conducive to learning and the access to educational services, teaching materials and technology for persons with disabilities are expensive, and lack of budget and cooperation for the publication of Braille books for visually-impaired students (VIS) and educational supplementary tools for diverse disabilities. Even OBEC attempts to support facilities, or other educational assistance, but it takes quite a long time to operate, and the process is very complicated. Moreover, some supplementary tools are not yet comprehensive to the teaching and learning needs of students with disabilities, especially in promoting English and other foreign languages, related facilities promote only basic English for

students mostly in the kindergarten and primary levels. (Special Education Bureau, 2021) Therefore, they still lack a lot of proper materials for learning English and other foreign languages. As there are many obstacles to educate the students with disabilities in learning English especially for VIS, the researcher is interested to develop the English for the Blind application assisted in learning English for communication for VIS in grades 10 to 12 in Thailand, to enhance their English proficiency, and support them to have a better future.

Research Objectives

1. To examine the students' English competency after the implementation of the English for the Blind application assisted in learning English for communication.
2. To study the satisfaction of visually-impaired high school students towards the English for the Blind application.

Literature Review

The Basic Education Core Curriculum B.E. 2551 (A.D. 2008)

The Ministry of Education announced implementation of the basic education curriculum for national education to provide all schools with the framework and orientation for preparing school curriculums. Teaching-learning activities are aimed at enhancing learners' quality regarding essential knowledge and skills required for their lives. The learning standards and indicators will enable agencies concerned at all levels to visualize expected learning outcomes throughout the entire course (Ministry of Education, 2008). English is the main foreign language prescribed for the basic education core curriculum, which all schools must prepare courses and provide learning management appropriately and aim at enabling learners to acquire a favorable attitude towards English, the ability to use it for communicating in various situations, engaging in a livelihood, and pursuing further education. The main contents of learning areas of foreign languages include learning standards of 4 strands of the Basic Education Core Curriculum (A.D 2008) namely strand 1: language for communication, strand 2: language and culture, strand 3: language and relationship with other learning areas, and strand 4: language and relationship with community and the world.

Bloom's Taxonomy

Learning outcomes are usually expected after the teaching and learning process ends, and the expected learning outcomes are the main points of learning achievement based on the

curriculum objectives. The Ministry of Education (2010) provided Thai schools with the Educational Objectives of Bloom's Taxonomy, one of the most used methods (Bloom et al., 1994; Gronlund, 1991; Krathwohl et al., 1956). For evaluating learning outcomes, the researcher developed the English for the Blind application by using the concept of Bloom's Revised Taxonomy (2001) as a guideline for the development based on the multi-tiered scale of Bloom's Taxonomy which expresses the level of proficiency required to achieve each measurable student outcome (Patricia Armstrong, 2021) for cognitive domain with six major categories: remembering, understanding, applying, analyzing, evaluating, and creating.

Language Immersion

Language immersion is another method to improve the communication of a second language. This method uses the target language as a teaching tool by surrounding or "immersing" students in the second language. In-class activities and outside the class are conducted in the target language. In this research, the theory is applied in terms of an immersion with technology that uses this idea to develop a tool for assisting English learning for the visually-impaired students to support their learning outside the class by themselves.

Total Communication

Total communication (TC) comprises one or more forms of communication (manual, oral, auditory, and written), which can be contingent on the needs of the students. The main advantage of TC is that it can provide opportunities and tactics in communicating for impaired students. TC, nevertheless, permits a diversity of groupings. Whether it is psychosocial, linguistic, or academic, research studies have frequently demonstrated the advantageous effects of total communication in all capacities of impaired students' development, (Vernon & Andrews, 1990). It may be difficult for one teacher to encounter all the communication requirements that might be present in a single classroom that is distinguished between a group of students with visual impairment. In this research, the researcher applied the philosophy of TC for creating the English for the Blind application by providing TC options in learning and combining all training of TC together; auditory, reading, writing, and speaking, so that visually-impaired students will get a greater development of English for communication, and be able to learn English through lessons and situational media.

Situational learning

Situational learning is a general theory of knowledge acquisition applied in the context of technology-based learning activities for schools that focus on problem-solving skills (McLellan, 1995). The term "instruction must be done in complex, social environments" means any skill must

be done practically in real world contexts such as musical skills require time to practice with the instrument. Situational learning is useful to help practice within the learning environment by people of equal status working together to enhance their individual acquisition of knowledge and skills (Anderson et al, 1996). In this study, the researcher created the English for the Blind application assisted in learning English for communication through lessons, or activities in the application which can help them to develop their English skills more efficiently. From the situational learning theory, an English learning environment is applied by using multimedia technology or the application. Brady (2004) proposes in “More Than Just Fun and Games” and shows that “multimedia education improves both comprehension of the lessons and students’ interest in the lesson topics.”

Conceptual Framework

The related contents in the literature review were in accordance with creating the English for the Blind application to collect the results of English competency from the pre- and post-tests and students’ satisfaction after using the application to check the effectiveness of the application. The conceptual framework was presented as in Figure 1.

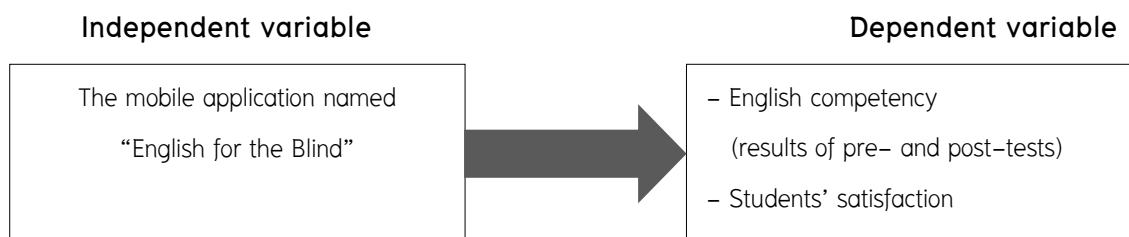


Figure 1: Conceptual framework

Research Methodology

Research design

This study was the research and development used a quasi-experimental design to compare the English communication competency of visually-impaired high school students (VIS) before and after using the English for the Blind application between the experimental group and the control group, to examine the efficiency of the application, and evaluate the students’ satisfaction towards the application which was shown in table 1.

Table 1: Design of the research

Group	Pre-test	Treatment	Post-test
Experimental group	O1	X	O2
Control group	O1	–	O2

As you can see in table 1, firstly, all VIS would take the pre-test to check their initial English communication competency. After that, the researcher gave the English for the Blind application to the VIS from Bangkok who were in the experimental group and let them use it for 4 months along with studying the English courses in their school, whereas the VIS from Chiangmai and Surat Thani who were in the control group, would learn English courses in their schools without using this application. Then, all students both in the experimental and the control groups would take the post-test to check their English competency after they finished studying for 4 months. The results of pre- and post-tests would be compared and analyzed to examine the changes of the students' English competency. All contents in the English for the Blind application consisted of pre- and post-tests, 10 lessons, and exercises, were in accordance with the indicators of 4 strands of learning areas of foreign languages of the Basic Education Core Curriculum (A.D. 2008).

Participants

The population of this research was 99 visually-impaired students (VIS) without additional overlapping disabilities in grades 10 to 12 in the 2021 academic year, chosen by simple random sampling. Moreover, there were 3 English teachers from 3 schools for the blind belong to Special Education Bureau who were in this study to assist the VIS in using the application as follows.

Table 2: The details of the samples

Lists	The high school grade levels			Total of the students	Teachers
	Grade 10	Grade 11	Grade 12		
	Students	Students	Students		
Experimental group					
Bangkok school for the blind	11	7	10	28	1
Control group					
Southern Region School for the Blind, Surat Thani	4	3	9	16	1
Northern Region School for the Blind under the Royal Patronage of Her Majesty the Queen, Chiang Mai	29	14	12	55	1
Total	44	24	31	99	3

From table 2, 28 VIS from Bangkok school for the blind were in the experimental group and were divided into 3 groups according to their grade levels. While the control group consisted of 16 VIS from Southern Region School for the Blind, Surat Thani, and 55 VIS from Northern Region School for the Blind under the Royal Patronage of Her Majesty the Queen, Chiang Mai. The VIS of each school in the control group were divided into 3 groups in accordance with their grade levels as well. The sample selection was in accordance with the rational reasons. The experimental group consisted of the VIS from Bangkok because this school was located in Bangkok: the capital city of Thailand, it was like the center of coordination for the blind throughout the country. Furthermore, choosing the sample group was related to their pre-test results as the students' scores from Bangkok were low, while the students' scores from Surat Thani and Chiang Mai were totally greater. For this reason, to prove that the English for the Blind application was exactly efficient to assist learning English. The researcher decided to choose only one school from Bangkok to be the experimental group, whereas the rests from Surat Thani and Chiang Mai were in the control group according to the reasons above.

Ethical consideration

To protect the rights of the sample group under the ethical consideration in the human subject research, the researcher submitted research and instrument protocol, initial review submission form, research subject information sheet, and the consent form, to ask for permission and approval from Suan Sunandha Rajabhat University Ethics Committee because the main participants in the research were visually-impaired students (VIS). After that, the researcher introduced research details, the experiment, the right of participants to the sample group which all VIS of every school including parents, English teachers, and the directors gave the consent and permission, and allowed the researcher to collect research data and conduct this experiment willingly and nobody dropped out. In the experiment, along the way of the before, during, and after process, the participants would initially have the researcher, and their English teachers to assist in using the application.

Research Instruments

1. A baseline survey: was used to query about the English communication competency and the use of other applications assisted in learning English before attending the experiment using 5-point Likert scale (Likert, 1932), to interpret the scores. The students' English communication competency before attending the experiment interpreted as 1 = The least, 2 =

Less, 3 = Fair, 4 = A lot, and 5 = The most. For the use of other apps before attending the experiment interpreted as 1 = Hardly ever, 2 = Sometimes, 3 = Often, 4 = Very often, and 5 = All of the time. To create the baseline survey, the researcher studied data from relevant books and researches as the guideline to create questions items, determined the issues and scope of the questions in accordance with the objectives, created a draft, and asked for 5 experts to check content validity and language use by finding out the index of item objective congruence (IOC) which the results were between 0.40 – 1.00, then the researcher tried out with 30 similar VIS, the discrimination index were between 0.50 – 0.91, and the reliability index was 0.92.

2. A pre-test: was used to seek out the initial scores, or English competency of VIS before the experiment, constructed based on the related English textbooks for the high school students in grades 10 to 12, and the ex-midterm and final test questions used in schools affiliated with the Ministry of Education in the 2021 academic year, and the indicators of 4 strands of learning areas of foreign languages of the Basic Education Core Curriculum (A.D. 2008), determined the 100 question items with 4 multiple choices and a writing part of the pre-test in accordance with the research objectives, and asked for 5 experts to check content validity and language use by finding out the index of IOC which the results were between 0.40 – 1.00. After that, the researcher chose 100 question items and asked for 30 similar VIS to try out, then assessed the difficulty index (p) and the effectiveness before the actual implementation which the difficulty index (p) were between 0.40 – 0.60, the discrimination index (r) were between 0.20 – 0.53, and the reliability result was 0.91, interpreted scores by using the scores' assessment criteria of The Common European Framework of Reference for Languages (CEFR).

3. A post-test: was used to measure the students' English competency in communication after the experiment. Steps to construct the post-test were the same as the pre-test, and the results of the index of IOC were between 0.40 – 1.00 as well. After a try-out and assessment, the difficulty index (p) were between 0.40 – 0.60, the discrimination index (r) were between 0.20 – 0.60, the result of the reliability was 0.92, and used the same scores' assessment criteria of the CEFR.

4. An endline survey: was used to query about students' satisfaction towards the English for the Blind application after the experiment, used 5-point Likert scale to interpret the scores as 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, and 5 = Very

satisfied. Steps to construct the endline survey were the same as the baseline survey. The results of the index of IOC were between 0.40 – 1.00. After a try-out, the assessment of the discrimination index were between 0.25 – 0.49, and the reliability index was 0.86.

5. The English for the Blind application: was developed to enhance the English communication competency for the VIS in grades 10 to 12. The application was created by using the concept of related theories to organize the contents and process of learning systematically. The application consisted of 10 lessons divided the contents in each lesson according to 4 English skills and the indicators of 4 strands of learning areas of foreign languages of the Basic Education Core Curriculum (A.D. 2008). The main parts in each lesson were comprised of listening and speaking, vocabulary, reading, grammar, and writing. In addition, there was a channel named “Welcome to English for the blind” to guide students how to use the application and tips to practice 4 English skills as shown in figure 2.

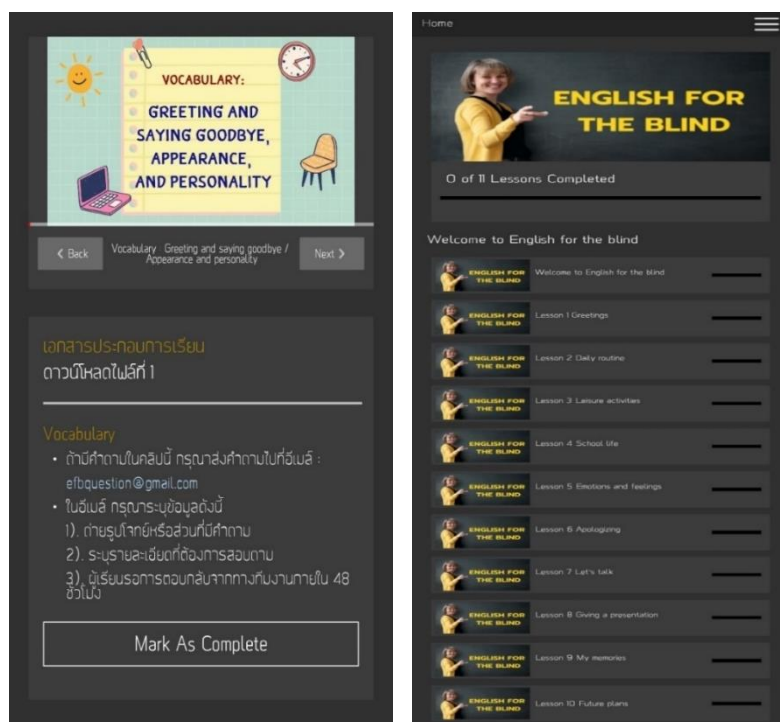


Figure 2: The contents in the application

The overview of the application had dark background, and bright font colors because the experts suggested to make them contrasted which would be helpful for some VIS who were not 100% blind might be able to possibly notice some contents in the application. Contents of every lesson were presented in the videos with accurate and clear sound system so that the VIS could

study without relying on the braille system. In figure 2, the students would find out the videos of each part in one lesson, and exercises in each lesson which the students could do along while they were studying which the teacher always explained the answers at the end in the videos to revise what they learned. Moreover, the VIS could download the files provided in the application and print out which facilitated them to learn English more conveniently. Besides, there were pre- and post-tests the VIS could do to assess their English skills before and after using the application which used the scores' assessment criteria of the CEFR to interpret scores.

Apart from that, the application was not only especially user-friendly and exclusive for the VIS, it also could be used by general high school students who did not have disabilities. All contents in the application, the students could redo or relearn as much as they wanted. Likewise, the application was created to be compatible with various devices, it could be displayed via any mobile phones or web browsers, and could connect to other software namely TalkBack Google, Voiceover, NV Access, and JAWS, and so on. Therefore, the application was enabled to use on diverse devices which the students just connected to the Internet, then the application could be used, that meant the application facilitated them to learn English for communication anywhere and anytime at their convenience. In addition, the researcher offered an official contact email "efbquestion@gmail.com", identified in the application in case the students or users needed any help assistants.

Data collection

The data collection was conducted from August to December 2021 in the 2021 academic year in 3 schools for the blind belong to Special Education Bureau, with 99 VIS without additional overlapping disabilities in grades 10 to 12 and there were 3 English teachers in each school supported and assisted the VIS till the end of the study. First, the baseline survey was used to collect data with all VIS to collect their English competency and the use of other apps assisted in learning English before attending the experiment. Then, the pre-test was used with all VIS to seek out the initial scores, or capability of the students in English for communication before the experiment. After that, the VIS from Bangkok in the experimental group used the English for the Blind application and studied all 10 lessons for 4 months assisted in learning English for communication, whereas the VIS in the control group from Chiangmai and Surat Thani would generally learn English in their schools without using the application. When the experiment had finished, the post-test was used with all VIS to collect their English competency. Finally, the results were analyzed in statistics.

For the second experiment, the researcher returned the application back to the control group in Surat Thani and Chiang Mai and let them use it for 4 months after the first experiment was completed. When the VIS in the control group finished using the application, the researcher compared the final examination scores of the control group in the 2/2021 academic year to the post-test scores of the previous experimental group to check the differences of their English competency. Lastly, the endline survey was used with all VIS to collect students' satisfaction towards the English for the Blind application after attending the experiment, and the researcher analyzed the results in statistics.

Data Analysis

This study used the descriptive analysis to analyze the results of English communication competency and the use of other apps assisted in learning English before attending the experiment of all VIS from the baseline survey, and students' satisfaction towards the English for the Blind application from the endline survey by using statistical formulas namely the frequency, mean, and standard deviation, and employed the 5-point Likert scale to interpret the scores. Furthermore, this research used the inferential analysis to analyze the students' scores in English communication skills from pre- and post-tests results, used the paired-samples t-test to compare the scores and assess their English competency after using the application, and used the scores' assessment criteria of the CEFR to interpret the scores.

Research Results

1. To examine the students' English competency after the implementation of the English for the Blind application assisted in learning English for communication.

According to this research objective, the researcher firstly had to analyze the English communication competency and the use of other applications assisted in learning English before attending the experiment of all VIS by using the baseline survey to know their initial information. Then, the researcher analyzed and compared the pre- and post-tests results to examine their English competency in communication afterwards.

The results of the baseline survey from all 99 VIS used statistical formulas namely the mean, and standard deviation, and employed the 5-point Likert scale to interpret the scores found that before attending the experiment, their overall of English competency in communication was fair, and the use of other apps assisted in learning English was often ($\bar{X}=3.38$) (S.D.=0.25). They

had a lot of good attitudes towards English for communication ($\bar{X}=4.15$) (S.D.=0.73), fairly used English for communication correctly ($\bar{X}=2.67$) (S.D.=0.80), fairly had knowledge and ability in English for communication ($\bar{X}=2.67$) (S.D.=0.76) and could fairly apply English for communication in daily life respectively ($\bar{X}=2.66$) (S.D.=0.74). For the use of other apps assisted in learning English before attending the experiment, they used apps to practice English communication skills outside the classroom very often ($\bar{X}=4.06$) (S.D.=0.78) such as YouTube, TikTok, and Facebook. Moreover, they were very often interested in apps to practice English for communication outside the classroom ($\bar{X}=4.06$) (S.D.=0.75), and someone had recommended them to use an application to practice English communication outside the classroom very often ($\bar{X}=4.03$) (S.D.=0.73). Lastly, they often exchanged knowledge and skills in English for communication with others ($\bar{X}=2.82$) (S.D.=0.76).

To analyze the pre- and post-tests results of the VIS in all 3 schools for the Blind, the researcher used the scores' assessment criteria of the CEFR to interpret the scores. Moreover, paired-samples t-test was used to analyze with mean, and S.D., to compare and check the significant difference of the students' scores. The results found that the VIS in the experimental group who used the English for the Blind application could improve their English competency up to 3 levels from B1 Intermediate ($\bar{X}=45.85$) (S.D.= 12.69) to C2 Proficient ($\bar{X}=84.96$) (S.D.= 7.70), while the VIS in the control group who did not use the app gained one level up after finishing their English courses in schools, which the VIS from Surat Thani improved their English competency from B2 Upper Intermediate ($\bar{X}=60.75$) (S.D.= 9.07) to C1 Advanced ($\bar{X}=67.68$) (S.D.= 7.30), and the VIS from Chiang Mai, gained up one level from B1 Intermediate ($\bar{X}=44.21$) (S.D.= 13.71) to B2 Upper Intermediate ($\bar{X}=53.89$) (S.D.= 13.46).



Figure 3: Graphs of the pre- and post-tests scores of the VIS in grades 10 to 12

As in figure 3, the comparison of the pre- and post-tests scores of all VIS was overall significantly different at the statistical level of .05. The post-test scores of the VIS from Bangkok in the experimental group obviously increased over the standard goal of the scores' assessment criteria of the CEFR up to full of 100 points and higher than the VIS in the control group from Surat Thani and Chiang Mai which their post-test scores were not too much different from their pre-test results.

When the researcher returned the English for the Blind application back to the control group in Surat Thani and Chiang Mai, and let them use the application for 4 months, the researcher compared their final examination scores in the 2/2021 academic year to the post-test scores of the previous experimental group from Bangkok again afterwards to check the differences of their English competency. The paired-samples t-test was used to analyze with mean, and S.D., to compare the scores and check the significant difference. The results were shown in table 3 as follows.

Table 3: The comparison of the mean, S.D., and paired-samples t-test of the final examination scores of the control group and the post-test scores of the previous experimental group

Test	Mean	S.D.	t	sig	Interpretation
Southern Region School for the Blind					
Final examination scores	81.18	6.99	0.77	0.453	C1 Advanced
Post-test scores from Bangkok	84.96	7.70			C2 Proficient
Northern Region School for the Blind under the Royal Patronage of Her Majesty the Queen					
Final examination scores	84.67	2.80	0.18	0.851	C2 Proficient
Post-test scores from Bangkok	84.96	7.70			C2 Proficient

* Significantly different at 0.05

As in the table 3, the final examination scores of the control group from Surat Thani were at the level of C1 Advanced (\bar{X} =81.18) (S.D.= 6.99) and the post-test scores of the previous experimental group from Bangkok were at the level of C2 Proficient (\bar{X} =84.96) (S.D.= 7.70) which they were not significantly different. As well as the final examination scores of the control group from Chiang Mai (\bar{X} =84.67) (S.D.= 2.80) and the post-test scores of the previous experimental group from Bangkok were not different neither at the same level of C2 Proficient, which meant that their English communication competency improved too after using the application.

2. To study the satisfaction of visually-impaired high school students towards the English for the Blind application

The results in this part were obtained from the endline survey to collect the students' satisfaction towards the English for the Blind application after attending the experiment. The results found that the overall of the students' satisfaction towards the application after attending the experiment was satisfied (\bar{X} =4.03) (S.D.=0.19). For lessons and activities in the application, the most things they satisfied were the contents and activities in each lesson which were appropriate for the learner's levels (\bar{X} =4.43) (S.D.=0.67) as they were accurate and clear (\bar{X} =4.36) (S.D.=0.56). Moreover, the content and activities corresponded to the learning standards and indicators of Basic Education Core Curriculum (A.D. 2008) in the high education levels (\bar{X} =4.26) (S.D.=0.63). Lastly, the number of contents and activities in each lesson (\bar{X} =4.17) (S.D.=0.70) and the interest of the content and activities (\bar{X} =4.16) (S.D.=0.50) were appropriate respectively. For the accessibility and functions of the application, what they most satisfied was about the functions that supported the use for the VIS namely voiceover, talkback, sound system, or braille connection system (\bar{X} =3.95) (S.D.=0.60), follow by the overview of the application was simple and easy to use (\bar{X} =3.94) (S.D.=0.52). They also satisfied that they could access to lessons and activities in

the application conveniently, accurately, and fast ($\bar{X}=3.71$) (S.D.=0.47) including the connections to menus or functions in the application ($\bar{X}=3.69$) (S.D.=0.46). Finally, they were satisfied how to register, or login linked to various social media accounts ($\bar{X}=3.64$) (S.D.=0.50).

Conclusion

To answer the first objective, the results could be concluded that before using the English for the Blind application, their English communication skills were fair. The VIS fairly used, applied, and exchanged knowledge and English communication skills in daily life. Besides, they often used other apps to assist learning English outside the classroom since they were very interested in apps to practice English and had a lot of good attitudes towards English for communication as well as someone recommended them to use various apps to practice English very often.

After using the application and finishing their post-test, the results found that the VIS from Bangkok in the experimental group who used the English for the Blind application could improve their English competency up to 3 levels, while the VIS in the control group gained one level up after they finished their English courses in schools without using the application both from Surat Thani and Chiang Mai. As the results, it can be concluded that the VIS could improve their English communication competency if they tried to pay attention in class. By the way, they could level up much faster and better than conventional coursework alone if they were trained appropriately with the educational tools such as the English for the Blind application assisted in learning English for communication which they could use anywhere and anytime at their convenience.

One more supportive result was when the researcher returned this app back to the control group in Surat Thani and Chiang Mai, and let them use the app after finishing the first experiment for 4 months, the results indicated that their final examination scores in the 2/2021 academic year after using the app increased remarkably which meant that their English competency significantly improved after using this application as same as the students from Bangkok in the first experiment. For this reason, the results could be summarized that the English for the Blind application was efficient, and literally developed the students' English communication skills.

To answer the second objective, the results showed that the students were mostly satisfied after using the application, especially the contents and activities in each lesson which were appropriate for their grade levels, accurate, clear, and corresponded to the Basic Education Core Curriculum (A.D. 2008). In addition, they were satisfied with the appropriate numbers of interesting contents and activities in each lesson. For the accessibility and functions of the

application, they were most satisfied with supportive functions for the VIS namely voiceover, talkback, sound system, braille connection system, and so on. At the same time, the application was simple and easy to use, they could access lessons, menus, and activities in the application conveniently, accurately, and fast as it was linked to various social media accounts.

Discussion

The findings would be discussed in accordance with the relevant researches, theories, and the research questions as follows.

1. How are the visually-impaired high school students' English competency after the implementation of the English for the Blind application?

The findings of the pre- and post-tests of the VIS in the study implied that the students could typically increase their English proficiency if they studied hard in class. However, if they utilized the English for the Blind application in conjunction with traditional schoolwork to study English for communication, they might level up considerably quicker and better which was consistent with research of Wipana Janwattanadachakhul (2012) conducted to evaluate Thailand's transition program for students who are visually impaired in light of the country's students who are blind or visually impaired. This research also emphasized the idea that blind students may achieve in their academic endeavors if their institutions can provide facilities that suit their need. As well as a research of Sester Retorta, Miriam and Lopes Cristovão, Vera Lúcia (2017) about visually-impaired Brazilian students learning English with smartphones: overcoming limitations which students had little to no ability to use smartphones, including apps such as WhatsApp and Facebook mobile at the beginning, but they were able to use better, listen to podcasts, and write texts on WhatsApp and Facebook mobile in both their native language and in English after two years of formal language and smartphone instruction. Moreover, the students also engaged in real-life communication events with peers in Brazil and other parts of the world via Mobile-assisted language learning (MALL) which helped these students enhance their social and cultural capital.

By the way, the reasons that the researcher used the English for the Blind application with all VIS and all grade levels because the indicators of 4 strands of learning areas of foreign languages of Basic Education Core Curriculum (A.D. 2008) were defined by the Ministry of Education to be employed the same learning outcomes with all high school education levels. Therefore, the results of this study were methodical and reasonable. The overall of the students'

English communication competency after attending the experiment was better. They obviously had greater attitude towards English for communication since they had better knowledge and ability in English for communication and could use more correctly. As the results revealed that the students realized the advantages of using mobile applications in learning English provided them having an opportunity to learn beyond classroom borders. Like the quote of Bornman (2012) said that "learning can be conducted anywhere and anytime, and learners can engage with teachers, learning resources and other learners." The numerous applications with innumerable utilities provide the learners with various options to have access to the target language as well as "English for the Blind" application, it was convenient, easily portable, useful, fast, fun, and free. Consequently, there was no doubt why the students were pleased to use it to enhance English knowledge for themselves.

2. What are the students' satisfactions towards the English for the Blind application?

According to the students' satisfaction, they most satisfied the contents and activities in each lesson which were appropriate for the learner's level, accurate, clear, and corresponded to the learning standards and indicators of Basic Education Core Curriculum (A.D. 2008), and the functions that supported the use of the VIS such as voiceover, talkback, and so on. All these things collaborated which made the VIS interested and satisfied. As well as the accessibility and functions of the application that were simple, convenient, and fast so that the reason why it was more used since it was user-friendly which was in accordance with Pisuttha Areerat (2007) stated that satisfaction means a person's feelings toward a particular thing, or to measure or evaluate the performance of computer media, assessment in terms of satisfaction of computer users which may be teachers or students, it is one way to measure the effectiveness of computer media. If the user is satisfied with the media, it will result in the learners accepting and responding willingly by being interested in learning or participating in activities which resulted in the students having better academic performance which was in accordance with a research of Nattiya Sornsuphap (2019) investigated the development of the class management with sound application for blind learners in Thailand in order to: 1) create a sound application for blind learners. 2) Research the learners' satisfaction with the accessible application for blind users. Students from the Roi-Et blind school made up the research population. 30 people who registered for Semester 2/2018 were chosen as a sample. The study's findings demonstrated that students' satisfaction with the sound application for blind learners was extremely high, and that they also had high levels of satisfaction with the sound application's technical and content aspects because it's easier for them to study. For this

reason, the results demonstrated that teaching and learning in the right way according to the curriculum together with modern, correct, and appropriate supplementary tools were able to enhance students' English skills. The results confirmed that adapting the theory of "Conditions of Learning" of Gagné (1985) with 9 instructional events and corresponding cognitive processes to plan the contents, lessons, teaching methods could facilitate the students to learn English for communication appropriately.

Recommendation

1. Teachers should offer and support the students with disabilities more alternatives or educational supplementary tools to study and let them practice English skills in different situations as much as they can as the findings proved that the students could progress their English competency better and faster when they were trained or facilitated appropriately. Moreover, the teachers need to focus on special functions such as the sound system, or braille connection system for students with visual impairments. Therefore, choosing pleasant sounds would be better and livelier than using the Siri voice. Besides, offering the students more platforms to approach the educational tools was the important issue that teachers should consider; for instance, providing the application that students can download to use either in the IOS or android systems because there are various mobile, or internet networking systems provided at present according to Hossain (2018), the numerous applications with innumerable utilities provide the learners with various options to have an access to the target language.

2. For further studies, it would be beneficial for students if the researchers apply this study as the ideas to conduct other kinds of computer programs or applications to enhance students' English language skills in other grade levels, other types of disabilities, or even the other subjects because the involved educational organizations have not enough teaching materials for students with disabilities as well as Department of Education Division of Special Education (1999) admitted that the education for visually-impaired students is no different from normal children, but only the curriculum has been adjusted to suit the child's disability conditions, adapt educational computer programs from sight to hear, so that those visually-impaired students will get the most benefit by supporting the required equipment or supplementary tools. However, some of them are limited, expensive, or some VIS need exclusive and specific equipment; for example, the VIS need to use textbooks with braille alphabets. Therefore, it would be great for Thai students whether they were visually-impaired or not. If they were provided with appropriate education, language knowledge,

necessary skills, or supplementary tools, it will helpfully support them to have potential and a great chance or a good future for sure.

3. The educational institutes should improve and manage information database for students with disabilities to be up to date and cover all dimensions which can help many local organizations or schools can reach the co-operation and co-ordination needed, so that they would be able to assist students with disabilities more conveniently and in time. Therefore, the teacher, who serves as a facilitator for students to achieve their goals through the educational process, should serve as the link between education and teaching in the educational system (Karsli, 2007, p. 9) as same as the systematic participation among a researcher, students, teachers, and schools in this study showed that we could finally conduct the useful application assisted learning English for communication together because of our great unite.

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