

The Effects of Mobile Blended Active Language Learning on the English Critical Reading Skills of High School Students in Thailand

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Abstract

Due to the tumultuous COVID-19 pandemic, the use of advanced technology in language education is currently on the rise, with English education being no exception. Simultaneously, the advancement and expansion of technology provide English as a foreign language students with multiple channels and opportunities to reinforce the four skills of English (reading, writing, speaking, and listening) to varying degrees both inside and outside the classroom. While previous studies have highlighted the feasibility and sustainability of blended learning in facilitating English skills, few studies have investigated the impact of mobile blended active language learning (MBALL) on promoting the English critical reading skills of Thai high school students. In hopes of filling this gap, the present study used both quantitative and qualitative methodologies to investigate the effects of MBALL on improving Thai high school students' English critical reading skills and their opinions on the use of MBALL. Pre- and post-tests were used to compare the students' critical reading scores before and after the MBALL implementation. A questionnaire was used to determine the students' opinions on the use of MBALL, and individual semi-structured interviews were employed to obtain more-detailed information. The results of the tests revealed that the Thai high school students' English critical reading skills had improved after implementation of the MBALL curriculum. Furthermore, the findings of the questionnaire and interviews suggested that the Thai high school students were enthusiastic about the use of MBALL.

Keywords: mobile-assisted language learning, blended learning, active learning, English critical reading skills

1. Introduction

Reading has been widely explored in the field of language education. In earlier decades, it was judged as a prerequisite language ability, and a number of empirical studies have focused explicitly on critical reading and thinking skills. According to Alshaye (2021), reading is a fluid and dynamic process in which both the reader and the reading material contribute to the construction of meaning. Reading can hence be thought of as a meaning-making process in which data from visual, semantic, conceptual, and linguistic sources is linked in such a way that the meaning of sentences and phrases can be comprehended. Cognitive skills, on the other hand, are vital for the development of active, participative, and productive reading (Anderson, 2003), since they enable readers to be critical and quickly shift to the appropriate reading skills as the reading situation requires. According to Spack (1993), in academic reading, students must be actively engaged in the text, use critical reading strategies to determine and decode the text's underlying meaning, and assess the correlation between the text and their studies.

To be more specific, critical reading requires readers to go beyond literal and interpretative comprehension of a text and assess the veracity of the author's views expressed in the work. As a result, they may or may not agree with the author, as critical reading entails approaching a text with skepticism and analysis before determining its worth (Douglas, 2000). Readers who engage in critical reading are attentive, engaged, thoughtful, and analytical in their discourse with writers via the text. In terms of the skills acquired in teaching critical reading in the digital age, students are expected to be adjudicative readers, which can help them become effective learners (Walz, 2001).

Nevertheless, English classes in Thailand involve rote learning, with students passively absorbing knowledge from the teacher. As a consequence, Thais have the lowest average English proficiency and cognitive skills in Southeast Asia because classes provide them with no room for argument or independent thought (Thaiger, 2019). According to the needs analysis conducted by the researcher, 62% of Thai students struggle with critical reading and have a desire to enhance their skills. This finding backs up Chawwang's (2008) assertion that Thai students' critical reading skills are lacking because they struggle with vocabulary, sentence structure, mindset, a lack of appropriate reading strategies, and insufficient reading resources, leading to frustration and an inability to comprehend their reading materials.

Additionally, cognitive skills, such as critical thinking, can assist people in thinking in a systematic and logical manner. In this regard, people with dexterous critical thinking skills generally have a better chance of thriving in life since they can unearth and solve problems on their own. Despite the fact that critical thinking abilities are essential in the 21st century, Thai students currently lack them. Due to the instructional methods and modes used in Thai schools, students rarely get an opportunity to practice and consolidate their critical thinking skills. In other words, Thai teachers do not teach their students to think; instead, they merely teach them to memorize (Thaiger, 2019).

As things currently stand, the COVID-19 pandemic is posing an unprecedented challenge to English teaching, as instruction must be delivered virtually online in order to prevent the virus's spread and motivate students to efficiently enhance their English skills. Simultaneously, to address the demands of a continuous curriculum during the pandemic, Thai language education institutions have organized the largest blended learning (BL) events to date (Each & Suppasetsee, 2021). Blended learning, in general, combines face-to-face and online instruction, instructional materials, social media, and language learning apps to improve the quality of instruction by managing the content offered to language learners in various online and face-to-face learning activities, and instructors are critical to the success or failure of BL instruction (Ginaya et al., 2018). For English teachers, developing and executing a BL program is a challenging and time-consuming process. However, BL practices have a favorable impact on students' second language acquisition (Alexeeva, 2020).

A single pedagogical approach is insufficient to improve Thai high school students' language and cognitive skills, and the use of an additional novel pedagogical strategy, such as mobile-assisted language learning (MALL), is needed. Researchers have examined the effectiveness of MALL on English language learning and critical thinking skills and concluded that mobile devices can improve students' learning, while students also tend to have universally positive attitudes toward the use of this technology to promote linguistic and critical thinking development (Each & Suppasetsee, 2021; Gaber, 2015; Bardus, 2021). However, even a combination of MALL and BL may not be adequate to sharpen Thai high school students' critical reading skills. A student-centered approach to language learning, such as active learning (AL), should also be used, and some research suggests that AL can help English as a foreign language (EFL) learners improve their English skills and is more human-centered and efficient than traditional learning approaches (Zewdu, 2017; Askia et al., 2016).

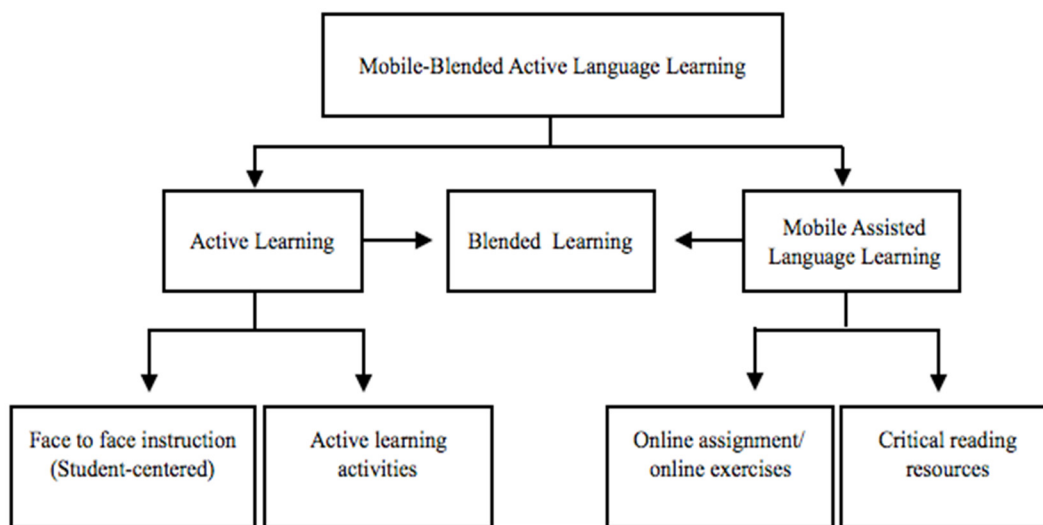


Figure 1. Mobile Blended Active Language Learning Overview Constructed by the Researcher

Despite the fact that there have been numerous studies on each in various academic fields, there has yet been no study focusing on the integration of MALL, BL, and AL to improve students' critical reading skills. To fill this gap, the purpose of the present study is to investigate the effects of mobile blended active language learning (MBALL) on Thai high school students' critical reading skills along with students' opinions regarding MBALL. Figure 1 shows a summary of the current study to outline its structure.

2. Research Questions

The research questions addressed in this study are as follows:

- 1) What are the effects of MBALL on Thai high school students' critical reading skills?
- 2) What are Thai high school students' opinions toward the use of MBALL to improve their critical reading skills?

3. Literature Review

3.1 MALL

Thanks to the advancement of technology and mobile gadgets, people currently have unrestricted access to knowledge anytime and anywhere. This trend has prompted academic interest in mobile learning, which investigates how mobile technology is being used in the classroom for teaching and learning. Mobile-assisted language learning first surfaced in 2005, when several American colleges began providing their students with free mobile devices (Yang, 2013). At the same time, English language teaching publishers have released standalone and textbook-based applications, driving MALL's global expansion and usage (Dudeny & Hockly, 2012). Mobile-assisted language learning is defined in a variety of ways, but its key elements are constant and include the following: (1) flexibility in terms of when and where learning takes place; (2) continuous research on multiple devices, such as cell phones, tablets, and laptops/desktops; 3) easy access to information; and (4) adaptability to individual learning habits (Duman et al., 2014). Based on these capabilities, students using MALL can immerse themselves in their English learning at any time, and their learning materials are always available across devices. Learners using MALL usually learn on their own and use MALL resources outside of the classroom, meaning MALL has proven to be crucial for independent language acquisition (Reinders, 2010). Given the benefits of MALL for independent language acquisition, it is here viewed as a viable strategy for improving Thai high school students' language and cognitive skills, particularly in critical reading.

3.2 BL

Blended learning is a flexible education method that mixes online learning with instructional materials and face-to-face instruction. Such neoteric teaching methods have become prominent in 21st-century education, particularly for the development of language skills (Kintu, Zhu, & Kagambe, 2017). According to Macdonal (2008), BL has its roots in business and workplace learning, although it has recently gained popularity in language teaching. The term is frequently connected with the integration of technology into courses or programs, acknowledging the value of face-to-face training and other traditional means of aiding EFL students. Blended learning is the obvious next step in the language learning agenda as it allows for the innovations and technology advancements associated with online learning and the interaction and involvement of conventional learning to be combined (Yaroslavova et al., 2020). In this study, BL refers to a teaching model that integrates technologies, such as the Internet, mobile communication, online assignments, face-to-face learning activities, and language learning applications, to ensure that students can benefit from both face-to-face and online instruction and activities.

3.3 Types of BL Models

According to Horn and Staker (2012), the majority of BL programs reflect one of four basic models: rotation, flex, à la carte, or enriched virtual. In the rotation model, students cycle between online learning and classroom-based modalities on a set timetable or at the discretion of the teacher. For this paradigm, students alternate between online learning, small-group or full-class lectures, group projects, one-on-one coaching, and pencil-and-paper homework. The important thing is to let students know when it is time to move on to their next activity. The rotation model also contains four sub-models: station rotation, lab rotation, flipped classroom, and individual rotation. In the flex model, online learning is the foundation of learning in a course or subject, even if it occasionally leads to offline activities. Teachers teach on site, and students study mainly on large campuses, save for assignments, progressing through learning modes according to a fluid, individually tailored schedule. The à la carte model features a course that students take entirely online in addition to their other experiences at traditional schools or learning centers. An online instructor is the recording instructor for the à la carte course. Students can attend à la carte classes on or off campus.

This method differs from full-time online learning in that it does not provide a full school experience. Some of the classes students take are à la carte, while others are mandatory. In the enriched virtual model, students are obliged to meet with their instructor face-to-face before being free to complete the rest of their schoolwork online. The enriched virtual model was used in the present study, reflected by the fact that the researcher used face-to-face teaching followed by online exercises and assignments. As previously mentioned, BL combines a regular classroom and an online environment, using the necessary technological tools to enhance linguistic and cognitive skills. As a result, the current study incorporates not only the enriched virtual model of BL but also MALL as an auxiliary method to improve critical reading instruction for Thai high school students.

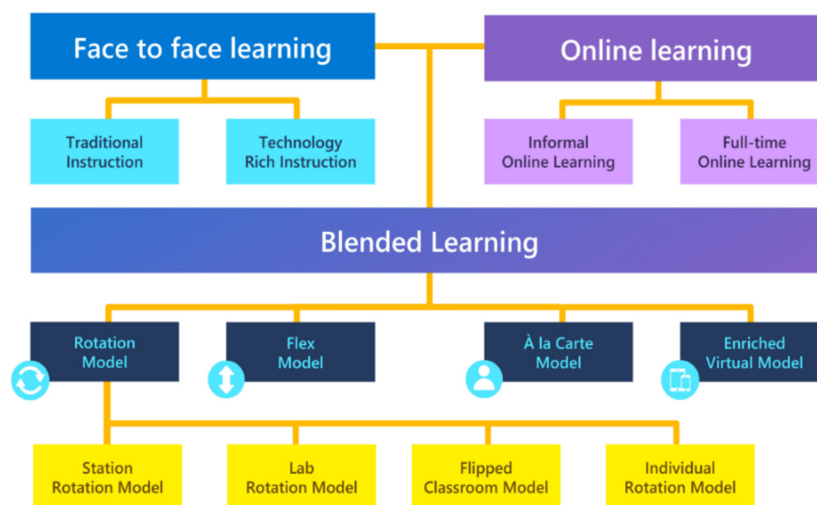


Figure 2. Four Main Models of Blended Learning (Horn and Staker, 2014)

3.4 AL

Active learning practices are defined by Bonwell and Eison (1991) as “pedagogical activities that get students to do something and think about what they are doing.” Active learning methods emphasize the development of students’ skills rather than the transmission of information and ask students to complete tasks that involve higher levels of thinking. As Coates (2009) suggests in her description of AL, “Students think independently and aim to actively develop their own knowledge.” Active learning, according to Prince (2004), can be applied in any sort of teaching approach since it merely encourages students to actively participate in the learning process, resulting in “meaningful learning.” As a result, AL can be defined as any educational activity in which teachers encourage students to become active participants in the classroom rather than to passively listen to what the teacher says. To cater to the needs and capabilities of Thai high school students in the current study, a number of AL pedagogical activities, such as jigsaw, peer review, double think–pair–share, cumulative brainstorming, mind maps, role play, psychoanalysis, and advantages and disadvantages, were designed and conducted as a scaffold to promote their critical reading skills.

3.5 Critical Reading Skills

The term “critical reading” refers to the process of examining and critiquing the arguments or statements made in a text. The critical reader’s role is to read between the lines and evaluate the material in order to comprehend its meaning in depth (Larking, 2017). As a teaching technique, critical reading can incorporate critical thinking processes, such as analysis, synthesis, and evaluation (Lee, 2015). Despite their similarities, critical reading and critical thinking are fundamentally non-identical. People can think critically without reading, but they cannot read critically without critical thinking. To put it another way, critical reading necessitates critical thinking. Critical reading skills include the integration of linguistic and cognitive abilities that readers might use while dealing with written texts in a range of reading settings. In a critical reading context, the reader must be critical of the author’s point of view on the text, which is demonstrated by effectively grasping the text’s information, exploring the underlying main idea, determining its purpose, separating facts from opinions, identifying the author’s tone, and using inferences and conclusions (Bowen et al., 1985). The analytical and inferential critical reading skills

highlighted in the present study include the determination of the main idea and purpose of the text and the drawing of inferences and conclusions.

4. Methodology

4.1 Participants

The participants in this study were a group of 25 high school students in Grade 11 who enrolled in an intensive English course at a private school in Chiang Mai, Thailand. The group included 11 males and 14 females between the ages of 15 and 18. The purposive sampling method was used to select the study sample. All of the participants were Thai native speakers who had been studying English for at least 10 years.

4.2 Instructional and Research Instruments

The instruments used in this study were divided into instructional and research instruments.

4.2.1 Instructional Instruments

Six MBALL lesson plans (24 teaching hours in total) with six teaching topics and a proto syllabus were designed and constructed by the researcher in terms of course objectives, indicators, the Thailand Basic Core Curriculum B.E. 2551, and the learners' textbooks. The six teaching topics were as follows: (1) Education Should Be Free, (2) Should Students Get Limited Access to the Internet?, (3) Pollution due to Urbanization, (4) Marijuana Should Be Banned, (5) Advantages and Disadvantages of Social Media, and (6) Contribution of Technology in Education.

The critical reading website Whooo's Reading was used to present the participants with a wealth of free reading resources and help them develop their critical reading skills. Using this website, students were able to keep track of the books they were reading, respond to open-ended questions, write reviews, and answer reading comprehension questions.

Online and face-to-face learning activities in accordance with the AL model were designed and implemented for each lesson plan, including jigsaw, peer review, double think–pair–share, cumulative brainstorming, mind maps, role play, psychoanalysis, and advantages and disadvantages. The instructional content and worksheets were adopted and modified from Project Explore Students' Book 5 by Oxford University. In addition, social media platforms, such as Facebook, Hello Talk, and Vice News, were used to promote and cultivate the learners' critical reading skills.

4.2.2 Teaching Steps

In the current study, the instructional process was divided into six steps in accordance with Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001), and MBALL concepts were integrated into each teaching step for each lesson plan. The specific steps were as follows:

Step 1: Remembering

To get students' attention and focus on the instructional content presented by the researcher in the first phase, the researcher used guided questions, videos, and other tactics. The objective of this step was to spark students' interest in the topic. Students were then provided with specific learning outcomes and objectives that the researcher expected of them. Finally, the researcher aided the students in retaining and integrating what they had learned in previous lectures into new learning themes.

Step 2: Understanding

During this phase, the researcher introduced new teaching content to the students through lectures, activities, and multimedia presentations; demonstrated and explained key knowledge points; assisted students in understanding and mastering new knowledge; and conveyed new knowledge for students to master outside of class. To boost their learning efficiency and performance, the researcher also provided students with learning guidance, dependable learning methodologies, learning support, and learning materials.

Step 3: Applying

In the applying phase, the researcher created MBALL activities and an environment in which the students could put their knowledge into practice. For example, students used their knowledge of English in actual conversation by role-playing, asking in-depth learning questions in a group, or doing individual activities based on their prior knowledge. Further, collaboration with peers was encouraged using the double think–pair–share method. Students could also turn to their mobile devices to aid in language study, such as by using Hello Talk to converse with native

English speakers and develop reading comprehension. In this way, students were able to tie new knowledge to their personal experiences and gain additional practice.

Step 4: Analyzing

In the analysis phase, students were asked to analyze an article based on what they had learned and what they already knew, including identifying the main idea, recognizing the writer's tone, determining the underlying meaning and topic sentences, and summarizing the article.

Step 5: Evaluating

During the evaluation phase, the researcher gave students immediate feedback on their performance in order to measure and support their learning. This consisted of group, peer, and individual feedback. Through peer review, students were also asked to evaluate and score the performances of their peers. Furthermore, they were asked to complete self-tests to determine whether they had attained the intended learning outcomes as a way of evaluating the effectiveness of the instructional activities and materials. In addition, their performance was measured against predetermined goals. Exams and quizzes, assignments, tasks, and other types of assessment were also adopted.

Step 6: Creating

The emphasis during this last step was on creativity. In particular, students were asked to critically consider the author's views based on the articles they had read and the knowledge they had acquired and then to come up with their own views on the topic. At the same time, students were required to defend their own views and back them up with solid and logical evidence and examples.

4.2.3 Research Instruments

To measure Thai students' critical reading skills, the Critical Reading Comprehension Test was employed as both a pre- and post-test. The test included 40 items testing different critical reading sub-skills with multiple-choice items, and each item had four alternatives: the main idea (10 items), the purpose (10 items), inferences (10 items), and the conclusion of the text (10 items). Each correct answer was granted a score of 1, and each wrong answer was granted a score of 0. Hence, the total score ranged from 0 to 40.

A questionnaire was constructed to investigate the participants' opinions on learning critical reading via MBALL. The questionnaire was divided into two sections: (1) demographic data and (2) opinions towards MBALL to improve critical reading skills (20 items). The statements related to students' opinions toward the use of MBALL were interpreted using a five-point Likert scale ranging from "strongly agree" to "strongly disagree."

The individual semi-structured interview consisted of six questions developed by the researcher. Each individual interview was conducted face-to-face and lasted approximately 20 minutes. To avoid missing any interview responses, the respondents' voices were recorded.

The proto syllabus, lesson plans, pre- and post-tests, questionnaire, and semi-structured interview questions used in this study were scored and validated using the index of item-objective congruence (IOC) by three specialists who each had at least 20 years of English teaching experience at a private university. The mean scores given to each instrument (proto syllabus = 0.86, lesson plans = 0.9, pre- and post-tests = 1, questionnaire and interview = 0.89) by the three specialists were higher than 0.5, meaning the instruments were valid and reliable. In addition, minor changes were made to the language used in the instruments based on the specialists' comments and suggestions. To determine the reliability of the pre- and post-tests, the researcher conducted a pilot study. After the pilot study, the researcher used Fulcher and Davidson's (2007) KR-20 coefficient to calculate each test's reliability. All the results were greater than 0.70, meaning the tests were reliable.

4.2.4 Data Collection Procedure

The data collection procedure consisted of six steps:

- 1) A pilot study was carried out before the main experiment.
- 2) A test of critical reading skills was administered to the target group as a pre-test.
- 3) The MBALL-based curriculum was taught to 25 high school students (target group).
- 4) When the curriculum had been completed, the participants took a critical reading skills test, which served as a post-test.
- 5) After the post-test was completed, a questionnaire was conducted on the following day to investigate the students' opinions toward the use of MBALL.

6) Individual semi-structured interviews were conducted after the participants had completed the questionnaire. For this step, 20 students were selected to provide in-depth comments according to their post-test scores (low, medium, and high) so as to provide in-depth opinions, feedback, and suggestions on the use of MBALL.

4.2.5 Data Analysis

In the present study, Statistical Package for the Social Science was used to determine the effects of MBALL on improving Thai students' critical reading skills and to examine the students' opinions toward the use of MBALL. The students' opinions toward the use of MBALL were analyzed in terms of means and standard deviations (SDs) on a five-point Likert scale and interpreted according to the following scoring scheme:

4.21 to 5.00 = Strongly agree;

3.41 to 4.20 = Agree;

2.61 to 3.40 = Unsure;

1.81 to 2.60 = Disagree;

1.00 to 1.80 = Strongly disagree.

To examine the effects of MBALL, a paired-samples t-test with a significance level of 0.05 was used, and descriptive statistics were applied to examine the students' opinions toward the use of MBALL. The interview data were analyzed and described in a qualitative manner. All the interviews were recorded, transcribed, and categorized according to each guiding question.

5. Results

5.1 Results from the Pre- and Post-Tests

Table 1. Comparison of critical reading skills on the pre- and post-tests

Critical reading skills	Number of students	Total scores	Mean (\bar{x})	SD	t	Significance (two-tailed)
Pre-test	25	40	13.256	8.528	-10.132	.000*
Post-test	25	40	30.33	11.325		

* $p \leq 0.05$

Table 1 shows that the mean pre-test score was 13.256, while the mean post-test score was 30.33. The critical reading skill scores attained on the pre- and post-tests were substantially different when compared using the paired-samples t-test ($t = -10.132$, $p \leq 0.05$). Overall, the post-test ($\bar{x} = 30.33$) had a higher mean score (\bar{x}) than the pre-test ($\bar{x} = 13.256$). The findings thus indicate that the students' critical reading skills improved after implementation of the MBALL curriculum.

5.2 Results from the Questionnaire

After the post-test, students were given a questionnaire to gauge their opinions on using MBALL. The statements made all dealt with their thoughts and feelings towards MBALL. An interpretation of the mean score of the students' perceptions is presented in Table 2.

Table 2 shows that all 20 items in the questionnaire were agreed upon by all students, with a total mean score of $M = 4.26$ ($SD = 0.62$). It was thus apparent that the students were enthusiastic about the use of MBALL for critical reading. The mean scores of the students' opinions toward the use of MBALL can also be classified according to the highest ($M = 4.57$, $SD = 0.49$) and lowest ($M = 3.76$, $SD = 0.79$) scores.

Table 2. Students' Opinions Toward the Use of MBALL

No	Student's Opinions	Mean	SD	Interpretation
1	The objectives of each lesson were clear.	4.26	0.69	Strongly agree
2	The contents in the student textbooks and online materials were parallel.	4.03	0.71	Agree
3	The online materials were useful and helped me learn better.	4.56	0.50	Strongly agree
4	Learning English via MBALL, I was able to easily contact the instructor and ask questions after class.	4.13	0.68	Agree
5	Learning English via MBALL, I was able to learn outside the classroom at my own pace.	4.33	0.47	Strongly agree
6	Learning English via MBALL, I was able to learn both online and on-site with my instructor flexibly.	4.30	0.53	Strongly agree
7	Learning English via MBALL, I was able to rationally solve day-to-day problems on my own.	4.13	0.77	Agree
8	Learning English via MBALL reduced my anxiety.	4.20	0.58	Agree
9	Learning English via MBALL enhanced not only my critical reading skills but also my grammar, vocabulary, and pronunciation.	4.40	0.56	Strongly agree
10	The language learning apps were suitable for learning English and cultivating critical thinking.	4.32	0.74	Strongly agree
11	The MBALL activities were enjoyable for me.	4.33	0.76	Strongly agree
12	I built up new knowledge on my own when participating in MBALL activities.	4.23	0.54	Strongly agree
13	The MBALL activities made me feel responsible for my own study.	4.40	0.49	Strongly agree
14	I prefer learning via MBALL.	4.56	0.67	Strongly agree
15	The MBALL activities helped me improve my reading and critical thinking abilities.	3.93	0.51	Agree
16	I had more confidence in critical reading after learning via MBALL.	3.76	0.79	Agree
17	The MBALL activities helped me think logically and rationally when reading passages.	4.26	0.57	Strongly agree
18	I had more opportunities and resources to practice critical reading via MBALL	4.13	0.77	Agree
19	The MBALL activities equipped me with more reading strategies and vocabulary.	4.57	0.49	Strongly agree
20	MBALL helped me read more accurately and smoothly.	4.30	0.58	Strongly agree
	Total	4.26	0.62	Positive Attitude

5.3 Results from the Semi-structured Interviews

The results of the semi-structured interview are here presented in three parts: the students' opinions, critical reading improvement, and obstacles.

5.3.1 Students' Opinions

All of the students (N = 20) expressed that they enjoyed learning with MBALL, for a variety of reasons, including its flexibility (N = 8), enjoyability (N = 9), ease (N = 11), novelty (N = 5), and effectiveness (N = 13). The following are samples of students' responses on this point:

SS3: *MBALL is better than traditional teaching techniques for me since it allows me to learn at my own pace and at my own time.*

SS5: *MBALL, in my opinion, is a fun game. In each lesson, our teacher employed a variety of engaging reading activities, which inspired me to participate in the classroom and work harder with my classmates.*

SS7: *MBALL appeals to me since it allows me to practice my reading abilities whenever I want using my phone and search for vocabulary that I don't grasp right away.*

SS10: *MBALL is beneficial to me since it prevents me from becoming bored or drowsy while attending class.*

SS6: *MBALL is pretty effective, in my opinion. In critical reading activities, I tend to show more of my skills, which helps me improve my vocabulary, thinking, and reading abilities. My mobile phone provides me with a multitude of reading materials as well as definitions for words.*

5.3.2 Critical Reading Improvement

Students were also questioned as to whether MBALL assisted them in improving their critical reading skills. All of the students (N = 20) said it had improved their critical thinking skills in various ways. In particular, the following themes were common: (1) MBALL instilled a new way of thinking in them (N = 12), (2) MBALL taught them more effective reading strategies (N = 8), (3) MBALL provided them with plenty of reading resources and immediate feedback (N = 15), and (4) MBALL boosted their reading confidence and encouraged self-directed learning (N = 8). The following are some examples of students' responses on this point:

SS1: *MBALL, in my opinion, is a really valuable learning method. I have learned a new thinking mode by learning to read through MBALL, and I can now read critically and analytically based on my own thoughts rather than merely agreeing with the author or superficially understanding any reading text.*

SS13: *I have learned certain useful reading abilities as a result of the MBALL course, such as quick scanning and detecting the article's main idea. This cut down on the amount of time I spent reading and improved my fluency and accuracy.*

SS16: *I believe MBALL is an excellent fit for me because, via a variety of critical reading activities, I have developed positive relationships with my peers and increased my reading confidence. After class, I even practiced reading alone to improve my performance in the reading class.*

SS8: *I think MBALL has enhanced my reading ability and vocabulary. Because I can access a large number of free publications through it, the mobile Internet is prepared to answer my inquiries. After class, I can consult with teachers and chat with peers at any time and from any location.*

5.3.3 Obstacles

During the interviews, students stated that they encountered certain challenges in engaging in MBALL classes, including financial difficulties (N = 8), various internet temptations (N = 15), and frustration caused by a lack of fundamental knowledge (N = 6). The following are examples of the issues the students raised:

SS6: *My parents are unable to provide me with a solid WIFI network and advanced electronic equipment, despite the fact that I enjoy MBALL and want to enhance my reading ability, which makes me feel uncomfortable when facing the teacher and classmates in MBALL class.*

SS8: *When I intended to study on my phone, there were several distractions on the Internet, such as commercials, appealing games, and celebrity gossip. These temptations keep me from concentrating on my studies.*

SS17: *Although I intended to participate more in MBALL reading activities, I discovered that my classmates had more fundamental knowledge and vocabulary than I did, which upset me because I got less benefit from the MALL reading activities.*

6. Discussion

6.1 The Effects of MBALL on Improving Students' Critical Reading Skills

Since students' mean post-test scores were higher than their pre-test scores, it is reasonable to conclude that MBALL effectively improved their critical reading skills. The apparent improvement in students' critical reading skills can be attributed to a number of factors.

First, the validation given by the three specialists in the English department through the IOC index could explain it. According to Muncerat and Chinokul (2014), when researchers use the IOC index to validate test items, they can learn whether the items are well-grounded and appropriate for the target students.

Second, the non-participant pilot study conducted prior to the main experiment likely validated that the MBALL materials were successful for developing critical reading skills while minimizing technical problems. In line with Fraser et al. (2018), the pilot studies were undertaken to increase the probability of the research items' success.

Third, the improvement may have resulted from the well-organized lesson plans, the proto syllabus, and the learning activities. The researcher carefully produced the lesson plans and proto syllabus and designed the MBALL activities based on the students' needs and capabilities. According to Amininik (2000), lesson plan preparation is one of the most important techniques language teachers can use to improve instruction quality because it serves as a guide for lecturers.

Fourth, the improvement may have been due to the researcher's circumspect implementation of the teaching steps from Bloom's Revised Taxonomy in each lesson to progressively develop the students' cognitive and language skills. This is supported by Chandio (2016), who states that, when implemented, Bloom's Taxonomy and the six stages/domains of learning, beginning with the lower degrees of learning (remembering, understanding, and applying) and progressing to the higher degrees of learning (analyzing, evaluating, and creating), vastly improve both the teaching and learning process and assessment practices.

Finally, the students' improvement may have resulted from the integration of MALL's, BL's, and AL's distinct features, which were incorporated into each lesson plan and led to excellent performance. These three methods (MALL, BL, and AL) were investigated and implemented together in the present study because a substantial body of research has confirmed the efficacy of each individually. For instance, according to a study by Bojović (2017), students performed better after using mobile BL, which was demonstrated to be useful and helpful for language learning. Another study on the effects of blended AL found that following a trial implementation, students' academic performance and learning motivation had improved (Wongsa & Son, 2020).

To summarize, the primary factors responsible for the positive results regarding the Thai high school students' critical reading comprehension included the IOC index scores given by the three specialists on the validity of the instructional and research instruments; the main research beginning after the pilot study; the well-designed lesson plans and proto syllabus; the cognitive teaching steps based on Bloom's Revised Taxonomy; the MBALL activities; and the combination of MALL, BL, and AL.

6.2 Students' Opinions, Critical Reading Improvement, and Obstacles Experienced in the MBALL Curriculum

Based on the questionnaire survey and semi-structured interview results, the Thai high school students were found to be enthusiastic about using MBALL because it was flexible, motivating, engaging, and effective.

The flexibility and effectiveness might be derived from the nature of BL, which allows students to take advantage of both online and face-to-face learning with flexible accessibility and to use education-related technology to meet their key learning needs, while catering to their various learning styles, paces, and times. These characteristics are consistent with Waston's (2008) view of BL, which states that BL strategies increase students' learning flexibility through online activities that support the course curriculum while also being effective and efficient due to a reduction in lecture time.

At the same time, the use of MALL and AL may lead to motivation and engagement among students by providing them with extensive access to a range of online learning tools. According to Hsu (2013), MALL promotes continuous learning outside of the classroom. In addition, it provides more freedom regarding the content learners wish or need to learn, and it encourages interaction in more life-like situations that learners may encounter during a job or under other conditions for which they are training. The students in the current study were also satisfied while involved in the learning activities, perceived the learning to be engaging and exciting, and participated more actively in classroom activities. In accordance with this, a study conducted by Munna and Kalam (2021) on the impact of AL strategies on student engagement revealed that students' cognitive, learning, and emotional behavior could be improved by the use of AL strategies, such as gamification, collaboration, and peer learning, resulting in increased engagement. Furthermore, the students had a higher sense of responsibility regarding autonomous learning as a result of the well-designed instructional activities. They also stated that MBALL was beneficial not only for English critical reading skills but also for improving other language abilities, such as grammar, pronunciation, and vocabulary. In addition, the students said they had more opportunities to express themselves in class and form positive relationships with their peers. These findings are in line with the study by Each and Suppasetsree (2021), who investigated the effects of mobile blended collaborative learning on EFL students' language skills and claimed that students were able to work in pairs or groups when engaged in mobile blended collaborative learning, expressing their own ideas on the exercises and forming positive relationships with their classmates.

In the present study, the MBALL curriculum helped all the students improve their English critical reading skills by providing them with effective reading strategies, unrestricted reading resources, and immediate feedback. Appropriate reading strategies, it can be deduced, have a critical impact on students' reading motivation and efficiency. According to Pantito (2020), reading techniques are required to significantly increase students' reading performance, and the target language facilitates readers through the employment of reading strategies. Furthermore, the critical thinking skills emphasized by MBALL caused a positive shift in the students' thinking modes. In particular, the students shifted from being basic readers to being critical, objective, and rational readers, meaning they gained higher-order thinking skills. Sufficient reading resources and timely feedback allowed the students to effectively practice their reading skills while also expanding their knowledge and vocabulary. Finally, through a series of AL activities, students' reading confidence and independent learning ability were stimulated and encouraged, which can be attributed to the significant role played by AL.

During the interviews, the students also revealed the obstacles they faced in learning through MBALL. First of all, internet access and the availability of mobile devices impeded certain students' use of MBALL, as some Thai students do not have the financial means to completely meet the expectations of MBALL. This result is in line with Jibrin et al. (2017) and Nuraeni et al. (2020), who found that internet access has a substantial impact on students' academic performance and that a lack of connectivity can be a challenge. Second, certain uncontrollable factors on the Internet, such as advertisements, non-teaching games, and celebrity gossip, diverted students' attention to some extent while using MBALL. This disruption was primarily caused by their social media applications, such as Facebook, Instagram, and YouTube. This issue is consistent with Nanthaboot's (2012) findings showing that social media interfered with students' involvement in learning at a Thai school. Finally, the students stated that they had difficulty reading due to a lack of vocabulary and grammar skills. As a result of these difficulties, they became discouraged and wanted to give up. This result is consistent with Rababah (2003), who claims that a poor vocabulary and lack of grammar expertise can prevent students from grasping crucial information and the main ideas of a reading, resulting in frustration.

Based on these findings, the researcher proposes that to properly teach critical reading skills in a BL context, teachers should take into account each student's financial situation, thoughtfully manage students' MALL, and provide students with appropriate vocabulary and grammatical knowledge as well as immediate feedback and comments on their work. However, despite these issues, the advantages of adopting MBALL still outweigh the disadvantages.

7. Conclusion

The purpose of this study was to investigate the effects of MBALL on Thai high school students' critical reading skills and their opinions on the use of MBALL in enhancing critical reading skills. According to the findings, the students' critical reading skills increased after studying with MBALL. According to the questionnaire and semi-structured interviews, the students assessed MBALL positively in terms of critical reading skills, critical reading improvement, flexibility, engagement, efficiency, and motivation. In Thailand's post-COVID-19 pandemic educational environment, MBALL is likely to be a successful teaching technique. If teachers are prepared and conversant with MBALL, students will be engaged in dynamic and enjoyable classroom situations. If teachers can become proficient and knowledgeable with regard to MBALL, the majority of the struggles in teaching EFL students can also be avoided, in any situation. By merging digital tools and 21st-century teaching approaches into the learning process, MBALL may have the potential to improve lifelong learning.

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References

- Alexeeva, E. A. (2020). Blended foreign language learning with increased online component: hybridization strategies and educational technologies. *Modern Linguistic and Methodical-and-didactic Researches*, 4(31), 55-65.
- Alshaye, S. (2021). Digital storytelling for improving critical reading skills, critical thinking skills, and self-regulated learning skills. *Cypriot Journal of Education Science*, 16(4), 2049-2069.

<https://doi.org/10.18844/cies.v16i4.6074>

- Amininik, S. (2000). *A survey of the implementation of lesson plan in Bushehr University of Medical Sciences*. Presented in the 4th national medical education conference in Bushehr.
- Anderson, L. W., & Krathwohl (Eds.). (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Longman.
- Anderson, N. J. (2003). Metacognitive Reading Strategies Increase L2 Performance. *The Language Teacher Online*, 27(7), 1-3. <https://doi.org/10.13165/ST-13-3-2-06>
- Askia, S., Manurung, K., & Wahyudin. (2016). Improving Speaking Skills through Active Learning Strategy of the Year Eight Students. *e-Journal of English Language Teaching Society*, 4(2), 1-13.
- Bardus, I., Herasymenko, Y., Nalyvaiko, O., Rozumna, T., Vaseiko, Y., & Pozdniakova, V. (2021). Organization of Foreign Languages Blended Learning in COVID-19 Conditions by Means of Mobile Applications. *Revista Romaneasca pentru Educatie Multidimensionala*, 13(2), 268-287. <https://doi.org/10.18662/rrem/13.2/421>
- Bojović, M. D. (2017). Blended learning as a foreign language learning environment. *Teme-Časopis za Društvene Nauke*, 41(4), 1017-1036.
- Bonwell, C., & Eison, J. (1991). Active learning: Creating excitement in the classroom. *AEHE-ERIC Higher Education Report*, 1, ED340272.
- Chandio, M. T., Pandhiani, S. M., & Iqbal, R. (2016). Bloom's Taxonomy to evaluate the cognitive levels of master class textbook's questions. *English Language Teaching*, 8(5), 100-110. <https://doi.org/10.5539/elt.v8n5p100>
- Chawwang, N. (2008). *An Investigation of English Reading Problems of Thai 12th-Grade Students in Nakhonratchasima Educational Regions 1, 2, 3, and 7*. University of Srinakharinwirot, Thailand.
- Coates, H. (2009). *Engaging students for success – 2008 Australasian survey of student engagement*. Australian Council for Educational Research.
- Douglas, N. L. (2000). Enemies of critical thinking: Lessons from Social Psychology Research. *Reading Psychology*, 21, 129-144. <https://doi.org/10.1080/02702710050084455>
- Dudeny, G., & Hockly, N. (2012). ICT in ELT: how did we get here and where are we going? *ELT Journal*. 66(4), 533-42.
- Duman, G., Orhon, G., & Gedik, N. (2014). *Research trends in mobile-assisted language learning from 2000 to 2012*. Cambridge University Press.
- Each, N., & Suppasetseree, S. (2021). The Effects of Mobile blended Cooperative Learning on EFL Students' Listening Comprehension in Cambodian Context. *Learn Journal: Language Education and Acquisition Research Network*, 14(2), 143-170.
- Fraser, J., Fahlman, D. W., Arscott, J., & Guillot, I. (2018). Pilot testing for feasibility in a study of student retention and attrition in online undergraduate programs. *The International Review of Research in Open and Distributed Learning*, 19(1), 260-278. <https://doi.org/10.19173/irrodl.v19i1.3326>
- Fulcher, G., & Davidson, F. (2007). *Language testing and assessment: An advanced resource book*. Routledge.
- Gaber, E. M. (2015). *Utilizing Mobile Assisted Language Learning (MALL) to Develop EFL Listening Skills and Learner Autonomy*. University of Mansoura, Egypt.
- Ginaya, G., Rejecki, M. I. N., & Astuti, S. N. N. (2018). The Effects of Blended Learning to Students' Speaking Ability: A Study of Utilizing Technology to Strengthen the Conventional Instruction. *International Journal of Linguistics, Literature, and Culture*, 4(2), 1-14. <https://dx.doi.org/10.21744/ijllc.v0i0.000>
- Horn, M., & Staker, H. (2012). *Classifying K-12 Blended Learning*. The Christensen Institute. Retrieved from <http://www.christenseninstitute.org/wp-content/uploads/2013/04/Classifying-K-12-blended-learning.pdf>
- Hsu, L. (2013). English as a foreign language learners' perception of mobile-assisted language learning: A cross-national study. *Computer Assisted Language Learning*, 26(3), 197-213. <https://doi.org/10.1080/09588221.2011.649485>
- Jibrin, M. A., Musa, M. N., & Shittu, T. (2017). Effects of internet on the academic performance of tertiary institutions' students in Niger State, Nigeria. *International Journal of Education, Learning and Training*, 2(2), 57-69.

- Kintu, M. J., Zhu, C., & Kagambe, E. (2017). Blended learning effectiveness: the relationship between student characteristics, design features, and outcomes. *Int J Educ Technol High Educ*, 14, 7. <https://doi.org/10.1186/s41239-017-0043-4>
- Larking, M. (2017). Critical Reading Strategies in the Advanced English Classroom. *APU Journal of Language Research*, 2, 50-68.
- Lee, Y. H. (2015). Facilitating critical thinking using the C-QRAC collaboration script: Enhancing science reading literacy in a computer-supported collaborative learning environment. *Computers & Education*, 88, 182-191. <http://doi.org/10.1016/j.compedu.2015.05.004>
- Macdonald, J. (2008). *Blended Learning and Online Tutoring: Planning Learner Support and Activity Design* (2nd ed). Routledge: London.
- Muneerat, P., & Chinokul, S. (2014). The development of English reading materials using inference strategies instruction to enhance English reading comprehension ability of upper secondary students: A case study of tenth-grade students of Chonkanyanukoon school. *OJED: An Online Journal of Education*, 9(1), 521-533.
- Munna, A. S., & Kalam, M. A. (2021). Impact of active learning strategy on student engagement. *GNOSI: An Interdisciplinary Journal of Human Theory and Praxis*, 4(2), 96-114.
- Nanthaboot, P. (2012). *Using Communicative Activities to Develop English Speaking Ability of Matthayomsuksa Three Students*. University of Srinakharinwirot, Thailand.
- Nuraeni, C., Carolina, I., Supriyatna, A., Widiati, W., & Bahri, S. (2020). Mobile-Assisted Language Learning (MALL): Students' perception and problems towards mobile learning in the English language. *Journal of Physics: Conference Series*, 1641, 012027. <https://doi.org/10.1088/1742-6596/1641/1/012027>
- Pantito, B. (2020). Development of teaching critical reading skills through reading strategies for enhancing readers-based linguistics synthesis. *Mahachula Academic Journal*, 7(2), 330-342.
- Prince. (2004). Does Active Learning Work? A review of the research. *Journal of Engineering Education*, 93(3), 223-231.
- Rababah, G. (2003). Communication problems facing Arab learners of English: A personal perspective. *TEFL Web Journal*, 2(1), 15-30.
- Reinders, H. (2010). Twenty ideas for using mobile phones in the language classroom. *English Teaching Forum*, 48(3), 20-25, 33.
- Spack, R. (1993). Student meets text, the text meets student: Finding a way into academic discourse. *Reading in the composition classroom: Second language perspectives*, 183-196. [https://doi.org/10.1016/1060-3743\(94\)90002-7](https://doi.org/10.1016/1060-3743(94)90002-7)
- Thaiger, (2019). *Six reasons Thailand's English skills are the lowest in SE Asia*. Retrieved from <https://thethaiger.com/news/regional/six-reasons-thailands-english-skills-are-the-lowest-in-SE-Asia>
- Walz, J. (2001). Critical Reading and the Internet. *The French Review*, 74(6), 1193-1205.
- Watson, J. (2008). Blended learning: The convergence of online and face-to-face education. Promising Practices in Online Learning. *North American Council for Online Learning*.
- Wongsa, M., & Son, B. J. (2020). Enhancing Thai secondary school students' English speaking skills, attitudes, and motivation with drama-based activities and Facebook. *Innovation in Language Learning and Teaching*, 16(1), 41-52. <https://doi.org/10.1080/17501229.2020.1853134>
- Yang, J. (2013). Mobile-Assisted Language Learning: Review of the Recent Applications of Emerging Mobile Technologies. *English Language Teaching*, 6(7), 19-25. <http://dx.doi.org/10.5539/elt.v6n7p19>
- Yaroslavova, E. N., Kolegova, I. A., & Stavtseva, I. V. (2020). Flipped classroom blended learning model for the development of students' foreign language communicative competence. *Perspectives of Science and Education*, 43(1), 399-412. <https://doi.org/10.32744/pse.2020.1.29>
- Zewdu, A. A. (2017). Challenges in Ethiopian Teacher Education Pedagogy: Resistance Factors to Innovative Teaching-Learning Practices. *African Journal of Teacher Education*, 6(1), 39-55. <https://doi.org/10.21083/aiote.v6i0.3624>

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