

## **The Effectiveness of Developing the Mobile Application for Learning English for Academic Purposes in a Thai Regional University**

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*Received: 2 June 2022*

*Reviewed: 1 October 2023-25 November 2023*

*Accepted: 28 December 2023*

*Published: 30 December 2023*

### **Abstract**

The objectives of this research were to develop and test the efficiency of a mobile application for promoting out-of-class English practice for Thai university students enrolling in an English for academic purposes course. This mobile application featured interactive flashcards, multiple-choice quizzes, matching quizzes, spelling quizzes, and a news-update page. The participants in this study were 79 undergraduate students divided into two groups based on their voluntary use of the application. In the experimental group, after the pre-test, 63 students downloaded and used the application for one month, while the control group consisted of the 16 students who did not download or use the app after the pre-test. Both the pre-test and post-test consisted of listening, vocabulary, grammar, and reading. Their pre-test and post-test scores were compared by using the pair-sample t-test in the experimental group, and the Wilcoxon signed-rank test was used in the control group. Additional data regarding the usability and perceived effectiveness of the app were collected using an online questionnaire and analyzed using the mean and standard deviation. It was found that students who used the app performed significantly better in their post-test than in their pre-test, but that was not the case for students in the control group who did not use the app. The data from the questionnaire show that users were satisfied with the app features and frequently used the matching quizzes, usage quizzes, and meaning quizzes. They also agreed that the app was usable and effective, and they supported further development in terms of contents. This shows that the application should be implemented in order to increase achievement in learning English for academic purposes.

**Keywords:** Mobile application; English; academic purpose; Thai university students

### **Introduction**

It is evident that new technologies, especially mobile application, have had vital roles in education policies and practice. Studies have shown that language learning apps have several advantages, such as user-friendly graphical user interface, wide-range of learning materials, features that motivate learners, and supplementary to traditional classroom learning (Fan, Liu,

Wang, & Yu, 2023). Many institutions in Thailand started to create the new environment in which instructions are digitized and offered via a learning management system (LMS) as a modular program, aiming to increase and improve abilities and create new skills for learners. Thus far, a great number of online courses have been put forward by major universities on their learning management platforms, for example ChulaMOOC, mycourseville.com, MUX platform, the Xlane, etc. Many other universities have also offered similar online portals for lifelong learners. This means that university education may never be the same. This trend seems to be influenced by online education platforms such as, MOOC, Edx, Courera, which have brought courses from top universities like Harvard, Stanford, Princeton, Cambridge University, MIT, etc. to offer online for enrolled students and public auditing. Thus, instructors may need to reexamine their roles and status and be more of a facilitator and content provider. This is in line with the plans of the Office of the National Higher Education Science Research Policy Council (2021), which envisioned that a paradigm shift is necessary in Thailand's higher education system because education should be competency-based rather than content-based. Moreover, the curriculum must meet the needs of not only high-school graduates but also people of all ages. Therefore, creative ecosystems and credit bank systems for open and affordable access must be made available to students both young and older generations. Somabat and Tuamsuk (2021) stated that higher education in Thailand had undergone some transformation even before the COVID-19 pandemic. There have been factors, such as disruptive technology, a shift in employers' expectations, and a lower student population, that influenced university administrators to reconsider their strategies and missions.

Mobile applications have been used in education regularly for several purposes, such as for communication, sharing digital documents, and accessing course contents. For example, instructors usually set up a *Line* group in order to keep in touch with students in a class section. Students can ask questions and discuss issues related to the course. In addition to *Line* application, many learning management system apps such as Google Classroom and Moodle are also frequently used. Mobile applications are used more and more in order to increase English proficiency of Thai university students. The Thai's Ministry of Higher Education, Science, Research, and Innovation had issued a policy to promote English language standards in higher education. The ministry pressured the boards of colleges and universities to set up policies and goals for improving English language proficiency in most education majors and levels. This mandate was supposed to be a guideline for developing students' skills and abilities so that they would graduate with sufficient communication skills and working knowledge of English. In addition, higher education institutions have implemented the policies and goals with clear attainment indicators and evaluation schemes. English language courses must be upgraded by focusing on the achievement of specified goals comparable to the Common European Framework of Reference for Languages (CEFR) or other standards (Thairath Online, 2016). As evident in Wudthayagorn's (2021), 81 public universities have followed through on this policy and implemented their English exit examination. Although an exit examination is unlikely to ensure the expected outcome, it could raise awareness of the significance of English among university students.

Currently, mobile application for learning English is very popular in Thailand. According to Similarweb.com which is a website that reports the statistics related to marketing research, the most used education mobile application is Duolingo. Moreover, many language learning game applications like Drops, Quizlet, and Italki are also downloaded, installed, and used widely. Many universities have also created mobile applications for students and the public to learn. Users can search a university's name on the app store and download the app. There are many types of state

higher education institutions, such as comprehensive universities, local universities, nursing colleges, military academies, and technologically oriented colleges and universities. Most of them are affiliated with the Ministry of Higher Education, Science, Research, and Innovation. The technologically oriented university where this research took place also has a specific department for providing English courses to students who are on career paths being particularly trained in high-level scientific and technological fields. They are specifically educated in order to meet the national needs for development. Therefore, so as to achieve this mission, the university has issued a regulation for the incoming students to take an English placement test. By requiring freshmen to do so, the university could determine their proficiency and register them for the appropriate-level English classes. Some newcomers who perform sufficiently well on the placement test are eligible for a waiver in basic English courses. Those who have not achieved the targeted proficiency are given four years to gain the English skills, and before graduation they are required to submit proof of English proficiency. However, since the COVID-19 pandemic had forced instructors to teach online and students to study from home, it was challenging for both parties to achieve the desired goal of building high English proficiency and skills. Although computer and Internet technology had been utilized to bring students and instructors together in a virtual class, there were hindrances, such as unstable Internet connections, a lack of devices or hardware, and distractions from the home environment (Korkiatsakul, 2021). Therefore, in an effort to facilitate resourceful online learning, this research aimed to create a mobile application containing English lessons and exercises for academic purposes. The researcher believed that out-of-class practice was crucial for English learning and development. Thus, the application was built based on active learning and self-directed, or autonomous learning theories. Students could practice on a mobile device, which served contents in interactive lessons and exercises in addition to learning in class. The major objective was to increase the opportunity for learning and keep students engaged, fostering lifelong learning behaviors among university students. The research question was whether a mobile application could improve Thai university students' English performance or not, and what their opinions on the usability and effectiveness of the mobile application for learning academic vocabulary and grammar were. The answer to the question might fill the gap that exists because in an EAP course, some students who don't have strong background in English may not be able to pass the course. Therefore, by providing them with the contents in the application that let them learn out of class, they could build more background in English on their own before going on to take the test. This application might be the new tool that bridges students' levels. Usually, the course in EAP contains advanced English; therefore, the development of this application would be the innovation that lets students prepare themselves for the more challenging level.

### Literature review

English teaching and learning in Thailand have encountered several limitations, especially because the environment does not facilitate enough English communication because communication is mainly in the Thai language, but Thai people are considered to be living in the expanding circle according to Krachu (1985). There is not as much English used as in Singapore, India, and Hong Kong, so it is not easy to find a context where everyone can converse in English. By leveraging technology, particularly mobile applications, English usage might not be limited to just the classroom. Mobile learning can engage users while on the move and encompass ubiquitous learning (Stockwell, 2022). This technology can bring English across borders, saving time and being convenient, fast, modern, and real-time. Therefore, including applications on mobile phones for teaching and learning activities is a learning method based on constructivist learning, which focuses on allowing students to use contents heard, read, viewed and written to construct knowledge by themselves in connection with existing knowledge and understanding to engender their own insights (Fangfang & Suwanthep, 2017; Rajendran & Yunus, 2021; Yakar, Sülü, Porgalı,

& Çalış, 2020). Mobile technologies are not only potential means for learning anywhere and anytime but also conduits to rich, multimodal content, providing unprecedented opportunities for the development of learner autonomy (Lyddon, 2016). Stockwell and Hubbard (2013) stated that if certain precautions are taken, there is the potential to fit mobile assisted language learning into the learning environment in a way that gives learners freedom to make choices but at the same time encourages active participation.

Mobile assisted language learning (MALL) has had an increasing role because the COVID-19 pandemic had a great impact on education, including English teaching and learning. It necessitated high-potential educational technologies, both software and hardware. Mobile devices, such as smart phones, tablets, and computer notebooks, have been deployed because teachers and students could not meet face-to-face for a prolonged period of time. The lockdowns sped up the adoption of a wide range of apparatus for distance and informal education via the Internet, such as social media, learning management systems (LMS), and videotelephony programs. Users had to suddenly become familiar with these tools. The most popular program for online teaching during the COVID-19 lockdown in Thailand seemed to be Zoom (Boonmoh, Jumpakate, Saengmanee, & Rungkaew, 2022). Universities purchased hundreds of licensed accounts for classes. Instructors and students learned to join a virtual meeting and participate in online classes. Both the hosts and participants used many functions, such as screen sharing, sound sharing, chat boxes, breakout rooms, etc. Each feature could increase the efficiency of pedagogical exchanges. Along with Zoom, web sites such as Kahoot, Padlet, and Mentimeter have also been widely utilized (Boonmoh, Jumpakate, & Karpklon, 2021). Mobile communication applications, especially Line, enable instructors and learners to stay in touch (Thonghattha, 2021). In terms of evaluation, Zoom was used to proctor together with a learning management system, like Google Classroom and Moodle, to deliver the exams on screen while students were taking exams from a distant place (Poonpon, 2021). Although glitches such as electricity outages and loss of connection often occurred during the exam, the online testing has been tolerable and dependable (Agarwala, Phadke, & Thilak, 2021; Kornpitack & Sawmong, 2022). Additionally, online drills and interactive workbooks accompanying the required texts were opened for students to consolidate what they had learned in class by playing educational games and practicing with additional tasks and drills in an engaging way. Online workbooks could be counted as part of the grading scheme because instructors can track learners' progress and performance (German & Lestari, 2021). Students may access the online workbooks via a computer web browser or the mobile application that the publishers supplemented.

Mobile applications for learning are complementary and well-liked innovations that attract learners to educational contents. Since mobile devices appear ubiquitous, learners are exposed to the lessons more easily. It keeps learners engaged with course content while they are outside the classroom, and it promotes active learning (Fuad, Akbar, & Zubov, 2018). In the app stores, a great number of educational apps are available. Users can purchase and download them to learn and practice English and other subjects at a convenient time for different learning styles and preferences. English learners can enjoy reading, listening, writing, and speaking with versatile applications on a smartphone, tablet or computer. This leads to cultivating self-directed learning, student agency, and active learning because users choose the content, format and time for learning by themselves (Xodabande & Atai, 2020). Many functions on the apps can create motivation to constantly acquire knowledge and gain effective communication skills. Some applications can facilitate chatting or oral communication with others in addition to voice calling and writing emails. If the users wish to continue their studies beyond the curriculum, they can practice more intensively to help establish a high level of English language proficiency for a test at the global level, such as the TOEIC, TOEFL, or IELTS, and, as a consequence, empower them to be life-long learners (Kang & Lin, 2019).

### Related research

The rise and popularity of Internet knowledge-based providers such as Khan Academy, Coursera, Edx, etc. proved that learners prefer to study at their convenience. These applications and websites are open to millions of registered users. It is a clear trend that the production and procurement of applications for learning English will increase and meet the unique needs of Thai students, especially university students in developing the ability to communicate at a higher level. Moreover, the application for enhancing English skills is not limited to a tertiary level. Thailand's Ministry of Education launched an application named "Echo" in 2016 for everyone to download and use to practice English without charge.

There have been many cases of research conducted on using an application to improve English skills in Thailand. Lyons (2016) studied the use of technology by students for their translation needs and investigated what tools the students used for the translation. The study was based on a survey of 1,707 students in four secondary schools based in Chiang Mai. The findings showed that students extensively used mobile technology (90.6%) and preferred to use a phone for Thai-English translation (74.5%). Mobile-based Google Translate was voted most popular by students (72.5%), followed by phone apps using LEXiTRON (14.4%).

In 2020, the application MALLO, standing for Mobile Assisted Language Learning Open-Resources, which was developed by Sukavatee and Klaisung (Chula Communication, 2021), won the silver medal at the 2020 Taiwan Kaohsiung International Invention and Design Expo. This application was devised based on research collecting data from more than 1,500 high school students. It can motivate users to learn the four skills through gratification and rewards.

Boonyawinit, Laisema, Mansukpol, Jaroenjittakam, Dechjitt, and Wasboonruang (2021) developed an application for education for modal verb learning in an English course for the third-year students and compared learning outcomes before and after studying using the application. They also assessed the satisfaction of the users. The results were that students who had learned from using the application for understanding modal verbs in the English course had a higher level of learning outcomes, with statistical significance at the level of .05, and their satisfaction was at a high level.

Shibasaki, Lalognum, Naewpraneed, and Somkid (2021) developed an application that had video lessons, exercises, and tests for English programs for Grade 8 students. They compared their learning achievements before and after using the application and examined teacher and student satisfaction. The researchers found students with a higher academic background and those with a mediocre background gained a post-test score higher than the pre-test marks at a significance level of .01. The participants were also highly satisfied with this application since it was not difficult to navigate through its architecture and contents.

Suwanjit and Srathongjeen (2021) also developed an application for university students to learn vocabulary based on the Common European Framework of Reference for Languages (CEFR). After the students used the application, the researchers surveyed their opinions of the experience and found that users were highly satisfied with the functionality, such as selecting levels of words and displaying words, and usability, such as access to menus, the user interface, and graphic layouts.

Koowuttayakorn and Taylor (2022) developed an application for language test preparation called the TU-GET CBT. It has features that allow users to become familiar with the Thammasat University Graduate English Test. After the development, the researcher conducted the usability test with 21 users and five experts who were asked to rate the system in the post-study system usability questionnaire, evaluating the usefulness, information quality, and interface quality. Moreover, an intrinsic motivation questionnaire was used to collect data related to interest, enjoyment, perceived competence, importance, tension, and values. It was found that while the

post-study system usability questionnaire showed participants' moderate satisfaction with the mobile application's usability, the intrinsic motivation questionnaire statements were rated highly, especially on the value and usefulness subscale.

From the above-mentioned research studies, it is evident that mobile applications are very widespread and full of potential, especially language learning apps, which have been quite disruptive as no other types of educational apps are used as often as language learning apps. An app like Duolingo has more than 14 million daily active users, with their numbers increasing by the day (Curry, 2023). They offer courses in languages from Spanish to Hawaiian and are no longer limited to only teaching vocabulary. Therefore, building an app for language learning can reach learners quickly; as a result, in this research, a language learning app was developed, implemented, and examined. The researcher hoped this app could contribute to the success of English learning in an English for academic purposes class, which is important because a lot of Thai students have limited background in English. When they are expected to read, write, speak, and listen to academic English, some of the students may not do well. A learning tool can assist them in the transition from being young college students learning English into more mature professionals ready to enter the workforce.

## Research method

### Research Design

This quasi-experimental research was conducted in an English for academic purposes class at a university located northeast of Thailand. This research design was derived from Ng, Azlan, Kamal and Manion (2020) who used the quasi-experimental study to examine a guided learning approach towards the use of mobile devices in learning English as a second language. It can be considered action research because the researcher was trying to improve students' learning. The participants were 79 undergraduate students, and they were divided into two groups based on their use of applications. The experimental group consisted of 63 students who voluntarily downloaded the mobile application and used it to review the vocabulary and grammar on their own. The control group contained 16 students who did not download the application and did not use it. The experimental group took the pre-test before the treatment (using the application), and they took the post-test. The control group took the pre-test and the post-test, but they did not get the treatment. Their pre-test scores and their post-test scores were compared to examine whether the use of the application had increased their post-test scores or not.

In this course, students studied the contents of four language skills in four units. Each unit started with watching a video to practice listening comprehension, followed by learning vocabulary, grammar, reading skills, and writing skills. The language level in the textbook adopted was equivalent to B1 in the Common European Framework of Reference (CEFR). For the evaluation, students needed to take two quizzes: the midterm exam, the final exam, and an online workbook. Quiz 1 and the midterm exam would be taken after the first two units had been taught and learned. Quiz 2 and the final exam were taken after the last two units had been covered in class. In the first half of the trimester, students did not use the application. However, since their scores in Quiz 1 and the midterm exam were unsatisfactory, the lecturer (researcher) informed them about the app, which was developed to promote out-of-class practice and scaffold their proficiency for this course. This application featured lessons and exercises on vocabulary and grammar covered in the English course in the second trimester of the 2022 Academic Year. They could voluntarily use this app to review word meanings and grammar usage. It was not mandatory. Thus, the participants were considered randomly selected since everyone in the class had the same chance, and they did not get a reward or any incentive. Because the application was created to promote self-regulated learning among the lower-performing students, the samples were divided into two groups based on whether they used the application or not. The researcher examined

whether using the mobile application could significantly improve their score in the final exam or not. The participants were requested to indicate whether they had downloaded and installed the application on their smartphone or not. It was found that 63 out of 79 had downloaded and used the app. 16 students did not do so. The researcher compared the midterm score to the final score of these two separate groups of students. The midterm exam served as the pretest, and the instrument for measuring their performance after using the app (the posttest) was the final exam, which contained 10 listening comprehension questions, 20 vocabulary questions, 10 grammar questions, and 20 reading questions. The midterm test and the final test were parallel. The vocabulary and reading passages were at the same level (B1). The participants voluntarily used the application along with in-class studying for five weeks (from February 1<sup>st</sup> to March 9<sup>th</sup>, 2023). In addition, the researcher administered a questionnaire online using Google Forms to elicit users' opinions related to the usability and usefulness of the app.

The link to the questionnaire was sent to the email addresses that the users provided when they registered. The researcher could gain access to the back office of the application and used the users' email to request that they fill out the questionnaire, which consisted of three parts. The first part was related to the frequency of use. They were asked which features they used the most frequently. The second part elicited their opinion on the application's usability and looks. The third part consisted of five questions concerning perceived usefulness. The back end of the mobile application also allowed the researcher to view usage statistics. The analytics graph indicated the number of users on each day during February 2023. This tracking could confirm that students really used the app to study on their own.

### Participants

The participants were 79 undergraduate students who aspired to be engineers and scientists. The researcher chose to conduct the research with these participants because many of them had lower background in English which needs some scaffolding. The application was supposed to help them practice more English for academic purposes. There were 45 female and 34 male partakers. But the researcher did not compare their performance based on genders. Only four students were in their third year at the university, so 75 of them were sophomores. They had a good background in mathematics and science. However, that might not be the case for their English schema. When attending class, they did not participate well in English, so the instructor could not conduct the class totally in English. Thai had to be used to communicate in tandem with English. Moreover, since the books used in class were monolingual and contained B1-level academic vocabulary, the researcher had to include Thai meanings in the flashcards and the meaning quiz in the applications in order to scaffold them. Many words were so academic that the participants needed to search for meanings in their first language to grasp the concepts.

### Design and development of the application

The researcher started the process by designing the mobile application, which consisted of seven menus, namely Flashcards, Meaning Quiz, Usage Quiz, Part of Speech Quiz, Spelling Quiz, Matching Quiz, and News. After the users downloaded the app, they were requested to create an account by filling in their name, email address, and password.

The Flashcards menu was used to supply vocabulary definitions and grammar lessons consistent with the textbook used in the English for academic purposes class. When users touched the Flashcard menu, the buttons led them to two submenus, Grammar and Vocabulary. If the grammar was selected, the four-unit numbers and titles appeared. Users could choose the unit in which they wanted to learn grammar points. If the vocabulary button was touched, the four-unit numbers and titles also popped up. After the unit number and title were tapped, the flashcards with definitions and sentence examples appeared. Some flash cards had pictures to aid users'

understanding of the meanings. There were arrows leading users to the next card and a back arrow to the previous card. The steps in design and development of and the application is shown below in Figure 1.

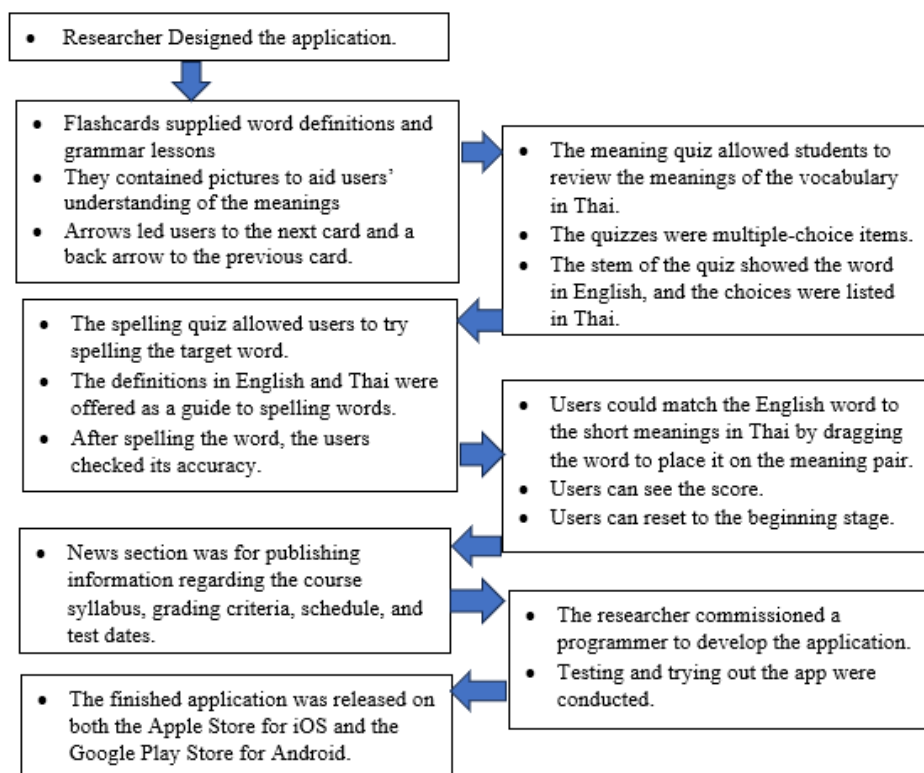


Figure 1. Steps in Developing Features of the Application

The meaning quiz allows students to review the meanings of the vocabulary in Thai. The quizzes were multiple-choice items. The same functionalities were built for the usage quiz and the parts of speech quiz. The difference between these menus was that the usage quiz tested users understanding of word meanings in sentences. But the parts of speech quiz tested user's knowledge about how words function in a sentence, whether they are nouns, verbs, adjectives, and adverbs. The spelling quiz allowed users to try spelling the target word by touching the space provided. In every quiz menu, scores appeared and increased every time a user got the item correct. In the last part, News, the instructor used it to announce some updates, for example, information regarding the course syllabus, grading criteria, schedule, and test dates. After the front-end design was finalized, a programmer developed the application. The finished application was then released. It is available on both the Apple Store for iOS and the Google Play Store for Android.

#### Data analysis

The research employed a pair-sample t-test analysis to prove the hypotheses. The null hypothesis was that students who used this application did not perform significantly better on the final exam than those who did not use the application. The alternative hypothesis was that students who used the application performed significantly better on the final exam than those who did not use it. There were 63 students using the application; therefore, the parametric pair-sample t-test was used to analyze the difference between their pre-test scores and post-test scores. In the experimental group, all the assumptions regarding the t-test were checked, and there was no violation. However, in the control group, the number of participants was fewer than 30—there were 16 students who did not use the application; therefore, the non-parametric pair-sample t-test (Wilcoxon signed-rank test) was used to compare the difference between their pre-test score and



post-test score. Their midterm scores were used as the pre-test, and the final exam scores were used as the post-test. For the questionnaire data, descriptive statistics such as means, standard deviations, and percentages were calculated, displayed, and discussed. The Likert scale of 1 to 3 was utilized to collect the data on frequency of usage and opinions on usability and effectiveness. Some qualitative data were also collected from respondents' opinions in the form of short texts, and they were categorized and summarized.

## Results

The result section consists of four main reports. The first report is a graph showing the frequency of application usage. This information was recorded and displayed by the program Firebase, which was used to manage the application's data. The second report was a comparison between the pre-test and post-test scores of students who used the application to practice and review the lessons. The third report is a comparison between the pre-test and post-test scores of students who did not use the application to review the lessons. The last report is an opinion regarding the use and effectiveness of the app.

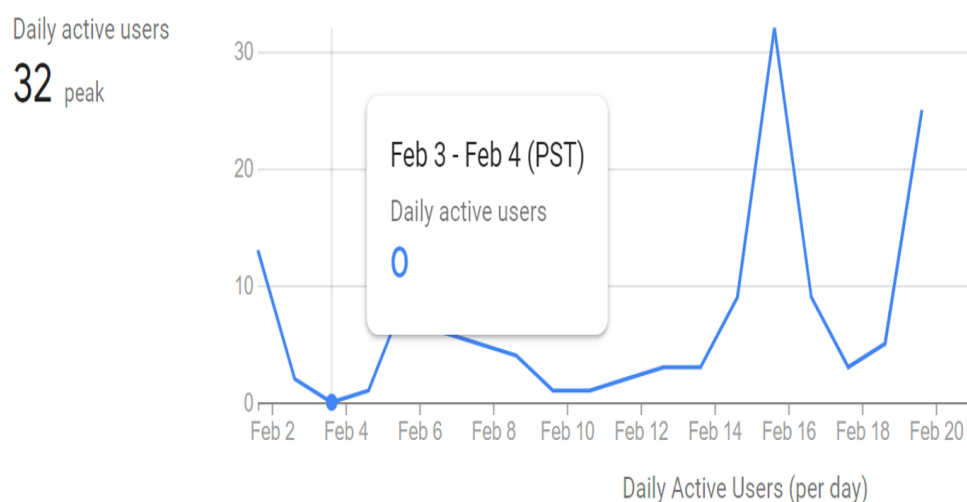


Figure 2. Daily Active Users

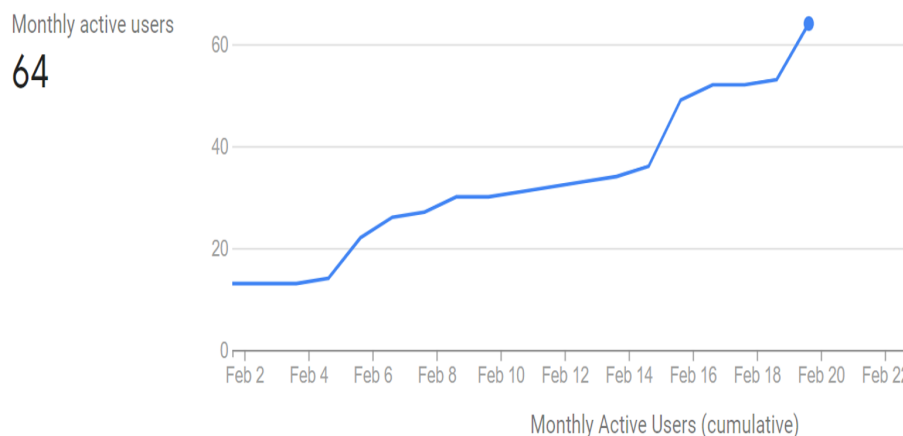


Figure 3. Monthly Active Users

As can be seen in Figure 2 and 3, users started downloading and using the app at the beginning of February 2023, and during the first two weeks of February, the number of users per day was steady. However, between February 14<sup>th</sup> and 16<sup>th</sup>, the usage surged sharply before dropping. The usage went up again on February 19. The second graph indicates that during the first three weeks of February, more and more students downloaded and were active. The number of users reached its peak on February 20<sup>th</sup>.

The second part is the result of using the application. As can be seen from Table 1, a pair-sample t-test was conducted to compare students' scores before and after using the application to scaffold their English proficiency. There was a significant difference in the pre-test score ( $M = 14.10$ ,  $SD = 3.92$ ) and the post-test score ( $M = 15.37$ ,  $SD = 4.40$ );  $t(62) = -3.154$ ,  $p = 0.000$ . These results suggest that using the mobile application to learn English on their own did improve users' performance in the English for Academic Purposes course.

Table 1. Comparison of scores before and after using the app

	N	Pretest		Posttest		t	p
		M	S.D.	M	S.D.		
EAP	63	14.10	3.92	15.37	4.40	-3.154	.002*

\* Significantly different at .05

The second part is the result of not using the application. Table 2 shows the results of the Wilcoxon signed-rank test, which was used to analyze the difference between the pre-test and post-test scores of the students who did not download and use the application. It was found that there was no significant difference between their pre-test score ( $M = 16.25$ ,  $SD = 4.40$ ) and their post-test score ( $M = 17.06$ ,  $SD = 3.90$ ;  $Z(16) = -.803$ ,  $p = 0.422$ ). These results suggest that without using the mobile application to learn English on their own, students did not improve their performance in the English for Academic Purposes course.

Table 2. Comparison of scores of students who did not use the app

	N	Pretest		Posttest		Mean Rank		Z	p
		M	S.D.	M	S.D.	Negative (6)	8.75		
EAP	16	16.25	4.40	17.06	3.90	Positive (10)	8.35	-.803	0.422

\* Significantly different at .05

The third part is the data from the questionnaire. The data from the first section of the questionnaire was about the frequency of use. There were seven features, namely the flashcards, meaning quiz, usage quiz, part of speech quiz, spelling quiz, matching quiz, and news. The respondent answered the question of how often they use each feature by selecting very often, often, and never. The scale of 1 to 3 was used to represent the rate of usage. As can be seen from Table 3, the matching quiz was used the most, followed by the usage quiz, meaning quiz, spelling quiz, and part of speech quiz, respectively. News and flashcards were the least frequently used.

Table 3. Frequency of Use

Features of the Application	N	Mean	S.D.	Meaning
Flashcards	30	2.20	.610	Used sometimes
Meaning Quiz	30	2.40	.563	Used often
Usage Quiz	30	2.47	.571	Used often
Part of the Speech Quiz	30	2.23	.568	Used sometimes
Spelling Quiz	30	2.27	.583	Used sometimes
Matching Quiz	30	2.50	.572	Used often
News	30	1.97	.718	Used sometimes

Table 4 shows the opinion of students on the usability of this application. According to the means, users totally agreed that it was easy to find and download the app. In addition, the buttons were responsive and clear. Moreover, the structure of the app was straightforward. The only features that may need improvement are the appearance and the feel.

Table 4. Opinion on Usability of the Application

Statements	N	Mean	S.D.	Meaning
It was easy to find the app on the stores.	30	2.53	.571	Totally agreed
Downloading and installing was not complicated	30	2.63	.556	Totally agreed
Each button was easy to see and press.	30	2.57	.568	Totally agreed
Structure of the app was not complicated	30	2.57	.568	Totally agreed
The looks and feels of the app are attractive.	30	2.23	.626	Agreed

In Table 5., the data on users' opinion on the effectiveness of the application is reported. As can be seen, all respondents seemed to totally agree that this application can be efficiently used for several purposes. For example, the interactive exercises were fun to do. The contents were also suitable for the level, and they would recommend this app to other students. In addition, even though their opinion on the app's ability to build motivation was lower than other efficiency measures, users still totally agreed with the statement that it could somehow inspire the students to learn English.

Table 5. Opinion on the Effectiveness of the Application

Statements	N	Mean	S.D.	Meaning
This app offers knowledge and skills.	30	2.60	.498	Totally agreed
This app can build motivation to learn English.	30	2.47	.507	Totally agreed
The content is appropriate for university students.	30	2.63	.490	Totally agreed
The exercises are fun to do.	30	2.67	.547	Totally agreed
This app should be recommended to other students.	30	2.60	.498	Totally agreed

In the third part of the questionnaire, users were asked to write short comments. It was found that most comments were positive feedback. For example, "I want to see more items and vocabulary added to the exercise games." Two users commented that the app should be developed further.

## Discussion

This research yielded many interesting results. For example, it was found that using the application to review the lesson out of class could contribute to their success in the EAP course. This is consistent with the result of Shibasaki, Laloghum, Naewpraneed, and Somkid (2021). The data from the online survey also shows that matching quizzes, meaning quizzes, and usage quizzes were the features used most frequently. The participants also indicated that the app was easy to find and download. The buttons were clear, and the layout was easy to navigate. The appearance of the app was viewed as mediocre. Participants viewed this app as very effective, especially the enjoyable interactive exercises and the appropriate contents. This result is in line with that of Boonyawinit, Laisema, Mansukpol, Jaroenjittakam, Dechjitt, and Wasboonruang (2021), who found that their app's users had a higher level of learning outcomes with statistical significance at the level of .05, and their satisfaction was at a high level. The results of this research also show that students were eager to use the application. It might be because the pre-test and post-test were high-stakes tests for them. Each test was worth 30%. Therefore, since their average score in the pre-test was lower than half or 15, the majority of them did not hesitate to voluntarily download and use the app when the instructor told them about it. They might have hoped that they could learn something from the app that assisted them in taking the post-test. They were not disappointed. Their scores in the post-test increased significantly. However, it was quite surprising to see that most usage occurred only one or two days before they took the post-test. It seemed that they had to study many subjects; as a result, they had to manage their time and allocated only a few hours to study English before the exam. It can be interpreted from this phenomenon that an interactive application could be the source of knowledge that students can resort to when their time is limited. They used app to review and study for exam. Even though students used the app for a short period of time, the effect was long-lasting as their scores in the high-stakes tests improved, and their grade could improve as well. The experience that users had can create motivation and a good attitude toward English learning. Therefore, they suggested recommending this app to others.

## Conclusion

This research was conducted in order to examine the effectiveness of a mobile application designed and built to promote out-of-class English learning. The application was built with the purpose of providing Thai undergraduate students with the opportunity to practice English vocabulary and grammar. The lessons and exercises were parallel to the textbook used in the English for academic purposes course. The participants were enrolled in this EAP course in Trimester 2 of the 2022 Academic Year, which ran from December 2022 to February 2023. The participants took the pre-test, which consisted of listening, vocabulary, grammar, writing, and reading. There were 60 items worth 30 points. After taking the pre-test, the researcher informed the students to voluntarily download the application, which they could use on their own while studying in class. 63 students downloaded the app, while 16 of them did not. After about one month, the participants took the post-test, which was parallel to the pre-test. It was found that students who used the app performed significantly better in the posttest than in the pre-test. On the contrary, students who did not use the app performed significantly worse on the post-test than the pre-test.

As for the recommendation for further research, the researcher would recommend doing a more strictly controlled experiment. This research was done by asking students in a class to volunteer using the app. Therefore, the number of users might be many more than those who did not use it. Therefore, it was not suitable to use the independent sample t-test to compare their scores. It would violate the assumption. The comparison had to be done within the group only by using the parametric pair-sample t-test for the app user's group and the nonparametric analysis in the group that did not use the app because there were only 16 non-users. If the number of users

and non-users were similar, the results might be different. It was also found that the number of students who responded to the questionnaire was small. Although 30 of them did provide their opinions and data, it was not easy to get them to respond. The researcher had to hire an assistant to request collaboration individually. This shows that some students may not be interested in contributing their viewpoints to the research and development. Some alternative approaches to collecting the data may be considered in order to gain insights.

#### Declaration of conflicting interest

The authors declares that there is no conflict of interest in this work.

#### Funding acknowledgement

The corresponding author received the support from Suranaree University of Technology

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