Computer Assisted Language Learning Electronic Journal (CALL-EJ), 23(3), 186-206, 2022

Students' Perceptions and Real-Life Use of Mobile Technologies in EFL Learning

Diem Thi Ngoc Hoang (ngocdiemvn.sfl@tnu.edu.vn) *Corresponding Author
School of Foreign Languages, Thai Nguyen University, Vietnam

Nicola F. Johnson (nf.johnson@ecu.edu.au)
School of Education, Edith Cowan University, Australia

Maggie McAlinden (m.mcalinden@ecu.edu.au)
School of Education, Edith Cowan University, Australia

Abstract

Despite the popular use of mobile devices in language learning by university students worldwide, there is little known about their uses in English as a foreign language (EFL) learning in Vietnam. The aim of this study was to investigate Vietnamese students' perceptions and actual use of mobile technologies in EFL learning in higher education. With a survey research design, data were collected from 505 respondents who were EFL students enrolled in undergraduate programs in a public university in Vietnam. The study results showed students' active use of mobile technologies for language learning, but their regular use was mainly restricted to primary and common applications such as dictionaries, translation, and social media. Most students had positive attitudes toward mobile learning technologies and were open to trying innovative applications. However, the study revealed students' self-reported challenges and need for further technical support and facilitating conditions. The study findings contribute significant implications for educational policies and language teaching practice related to students' behavioural usage and perceptions of using mobile technologies in language education.

Keywords: mobile devices, mobile learning technologies, EFL, higher education, Vietnam

Introduction

Until the current decade, many academics were hesitant to accept any application based on cell phones in class (Pence, 2010) and students' use of smartphones in their daily lives contrasted with their use inside the classroom (Kolb, 2008). However, the recent widespread adoption of mobile devices by young people makes it hard for higher education to resist using the devices in formal education (Murphy et al., 2017). As the new generation of the twenty-first century, students may find schoolwork more authentic with the daily integration of wireless laptops or devices for learning (Ashburn & Floden, 2006). Fixed technologies (i.e., computers) tend to be separated from daily life, while mobile technologies (i.e., mobile devices) tend to be part of it (Pegrum, 2014).

Mobile technologies offer a wide range of features and benefits that enable them to innovate the educational system, create a novel approach to reach digital natives, and personalize content and skills for the future (McQuiggan et al., 2015). Some major outstanding benefits of mobile learning include the ability to learn on the go, reaching underserved children and schools, improving higher-order thinking skills, and supporting alternative learning environments (McQuiggan et al., 2015). Situated learning with mobile devices is seen as a bridge between formal school settings and outdoor scenarios, making tasks in school less decontextualized and more authentic because it enables learner-centred, collaborative, situated, contextual, and ubiquitous learning (Pfeiffer et al., 2009). More importantly, the development of mobile technologies does not mean the end of classrooms, but it may negatively affect those classrooms which fail to open up to mobile technologies and digital networks and follow a student-centred direction (Pegrum, 2014).

According to recent statistics, with around 69 million smartphone users in 2022, Vietnam is currently among the top ten nations with the largest number of smartphones in Asia (Nguyen, 2022). Research reports also reveal that 100% of university students had smartphones (Hoang et al., 2020; Tran, 2016). Visioning the benefits of technology in general and mobile devices in particular, the government of Vietnam recently has put great effort into technology investment in education in both staff training and facility up-gradation (Government of Vietnam, 2017; Ministry of Education and Training, 2016).

Despite the significant growth in the number of mobile device users and investment and support from the government, the application of mobile technologies in language education is still under-researched in Vietnam (Nguyen & Dang, 2012; Nguyen & Pham, 2020; Vo, 2020). Recent studies revealed that most Vietnamese students had access to computers, smartphones, and other mobile devices but had limited experience with mobile learning (Murphy et al., 2014; Tran, 2016; Vu, 2016). Students spend more time using technology for private purposes than they do in technology-related learning activities in formal learning environments (Tri & Nguyen, 2014). In other words, students' widespread use of smartphones in their daily lives contrasts with their limited use inside the classroom (Kolb, 2008; Tran, 2016). To date, there is still little empirical evidence about mobile-assisted language learning in higher education in developing countries like Vietnam (Vo, 2020).

With its benefits and affordances, mobile learning has the potential to be a valuable alternative for the traditional form of language education in Vietnam, where the individual possession of mobile devices is skyrocketing in number, particularly in such an emergency time as the COVID-19 pandemic when traditional education has been challenged. However, there is a knowledge gap in research-based evidence on students' actual use and perceptions of using mobile technologies for foreign language learning, particularly in developing countries like Vietnam, where digital learning conditions are less advantageous than in developed ones. For that reason, this study was conducted to investigate the actual use and perceptions of using mobile technologies of English as a Foreign Language (EFL) students at the higher education level in Vietnam. The study aimed to address the following research questions:

1. What is the real-life use of mobile technologies for language learning by EFL undergraduate students?

2. How do EFL undergraduate students perceive using mobile technologies in language learning?

Literature review

Overview of Technology and Innovation in Education

Innovation is basically understood as the process of developing a novel idea to help people do their jobs in a new way or create something different from what one is doing, either in quality or quantity or both (Serdyukov, 2017). Innovation is significant for society to develop and thrive. In education, innovation can take place in various areas and forms such as "a new pedagogic theory, methodological approach, teaching technique, instructional tool, learning process, or institutional structure that, when implemented, produces a significant change in teaching and learning, which leads to better student learning" (Serdyukov, 2017, p. 8).

Among factors leading to innovations in education, technology with its advancements has rapidly innovated education performance worldwide. Since their appearance in education, computers have been promising to revolutionize the classroom for decades (McQuiggan et al., 2015). They have become smaller, easier to use, more efficient, and now are no longer strangers in the classroom. The world has now been in a new era of technology and mobile technology, and it is believed that "mobile technology with smart implementation and progressive school policies can lead the way" (McQuiggan et al., 2015, p. 6). Similarly, McCrory (2006) proposes the affordances of technology that can support both learning and teaching with authenticity. Four main affordances for learning include (1) representation of ideas and processes that are difficult or impossible to represent without technology; (2) information via access to data and content; (3) transformation of tasks in which students engage; and (4) collaboration via facilitating communication and collaboration with peer and experts (McCrory, 2006).

Mobile Learning in Language Education

With the increasing use of technology for educational purposes, many researchers have suggested that technology is an appropriate and long-term investment for language education (Crompton & Burke, 2018; Shadiev et al., 2020). Mobile learning lends itself to outstanding features that distinguish it from other non-technology forms of learning, such as the ubiquity of access to information, flexibility which promotes independent and collaborative learning, interactivity, multimodality, personalization, comprehensiveness, security, high-order thinking support, and consolidation (McQuiggan et al., 2015; Shadiev et al., 2020). Mobile technologies are considered a powerful means to make language learning tasks more meaningful, goal-oriented, communicative, and authentic (González-Lloret, 2017). A recent meta-analysis conducted by Sung et al. (2016) shows that mobile devices generally have more effects on students' learning performance than desktop computers or the non-use of mobile devices. Another review of research between 2012-2016 focusing on collaborative language learning conducted by Kukulska-Hulme and Viberg (2018) reveals some significant affordances of mobile technologies to support collaboration, such as flexible use, active participation, timely feedback, and cultural

authenticity. Mobile learning is predicted to be a future trend in developing countries (Seraj et al., 2021) thanks to its features that potentially facilitate education anywhere and anytime, particularly at a time when the number of users of smartphones and portable devices is growing incredibly fast.

There have been numerous studies investigating the effectiveness of different mobile technologies in English language learning. For example, Ahn and Lee (2016) revealed the potential of automatic speech recognition of mobile devices in developing Korean EFL students' speaking proficiency. Another Indonesia-based study reported the effectiveness of mobile-supported gamification to develop EFL students' vocabulary (Fithriani, 2021). Students' English writing skills were found to be strongly supported by mobile-mediated hybrid dynamic assessment in a study conducted in Iran (Rad, 2021). In another Iranian study, EFL students reported a high rate of modified output in video-based mobile-mediated interaction (Aeen et al., 2021). Several other studies showed the benefits of emerging mobile applications such as augmented reality or virtual reality in developing EFL students' speaking proficiency in different contexts (Hoang & Nguyen, 2019; Hoang et al., 2022).

In addition to English learning outcomes, students' agency, critical thinking skills and conceptual understanding were reported to be improved in a number of studies (Ha, 2020; Luo & Watts, 2022). A study by Z. Yu et al. (2022) compared mobile learning tools, social media tools and traditional teaching tools (e.g. a projecting system) to investigate Chinese students' engagement in English learning. The study indicated that mobile learning tools significantly improved students' behavioural and cognitive engagement in learning preferred compared to other tools. Several also studies reported students' engagement and enjoyment in language learning in mobile-assisted learning environments (Fithriani, 2021; Hoang et al., 2022; Khansarian-Dehkordi & Ameri-Golestan, 2016; Zhang & Perez-Paredes, 2021).

Previous Studies on Learners' Perceptions and Real-Life Use of Mobile Technologies

Students' perceptions of using mobile technologies in language learning have attracted researchers' attention so far. A study by Caldwell (2018) investigated Japanese EFL university students' perceptions of mobile learning over a twelve-week use of mobile applications. The study showed that students had positive attitudes toward mobile learning and acknowledged the convenience of the technology despite the distraction it caused in class. Positive attitudes toward using technology in English language learning were also reported from university students in Hong Kong (Lee, 2020) and from Vietnamese teenagers (Pham & Lai, 2022). A study by Luo and Watts (2022) investigated university students' perceptions from their lived experience of using smartphones in English language learning in China over a period of a five-month pilot. Participants of this study reported they valued the ubiquitous function of smartphones and the integration of personal, sociocultural, formal and informal processes of learning. EFL students in another China-based study valued the benefits of the portability and in-built functions of mobile phones in EFL learning (J. Yu et al., 2022). A study by Seraj et al. (2020) reported a high level of readiness of using smartphones by EFL university students in Bangladesh regarding usability, availability, and positive attitudes. As reported in a recent study with Vietnamese higher education language learners, attitudes toward mobile learning were

found to be the most important factor in predicting learners' behavioural intention of use of mobile technologies (Vo, 2020). However, a Turkey-based study revealed contrasting results with university students reporting suffering from adverse effects of smartphones if they spent more time online (Şad et al., 2020). Another study by J. Yu et al. (2022) showed students' preference for reading from papers over reading from mobile devices due to better reading experience and reading engagement in EFL reading activities. In general, most studies reported students' attitudes toward mobile learning technologies as a result of partaking in planned interventions by the researchers. It is difficult to predict whether they would actively engage in language learning with mobile technologies without interventions or intentional planning by teachers or researchers.

Despite the large number of studies investigating students' perceptions of using mobile technologies, very few studies have investigated students' real-life use of mobile technologies in language learning. A study conducted in China reported university students' regular use of smartphones for language learning outside the classroom, in both self-initiated and teacher-initiated activities but these participants needed further technological guidance to develop language skills (Wu, 2019). In another China-based study, postgraduate EFL students were reported not to be active in regularly using mobile-supported English learning resources and not being able to select suitable mobile learning resources (Zhang & Perez-Paredes, 2021). This study also revealed students' most regular behaviour of using mobile technologies to learn vocabulary compared to their use in other aspects of language learning. In another study conducted in Turkey, university students were reported to use their smartphones more frequently for listening and speaking skills than reading and writing skills (Şad et al., 2020). A Vietnam-based study suggested that university students found mobile phones useful in accessing course materials (Khanh & Gim, 2014). A study by Lee (2020) reported a discrepancy between Hong Kong university English students' real-life use of technologies and their intention to use technologies. Even though there has been researching on students' actual adoption of mobile technologies for language learning (without impacts of interventions), there are limited studies providing a comprehensive picture of how and how often students use mobile technologies to learn language subjects, language skills, as well as how they exploit in-built functions as well as installed applications for language learning.

Methods

Research Design

The study adopted a quantitative research design with survey as the main technique to collect data due to its low cost, timeliness, and convenience for both researchers and respondents (Gray, 2009). In this study, a descriptive survey was used to measure "the characteristics of a particular population", and "what occurred rather than why it occurred" (Gray, 2009, p. 220). The survey was designed for online completion in order to reach respondents quickly, bring convenience to respondents, and protect their identity (Cohen et al., 2011; Gray, 2009). Moreover, web-based questionnaires offer many other convenient functions that traditional paper-based ones cannot have, such as drop-down lists, skip patterns, appearance formatting, response forcing, data downloading, and so on (Gray, 2009).

Participants

Participants of the study were drawn from a population of 1980 EFL students enrolled in a public higher education institution in Vietnam. Ethics approval was granted by an Australian institution before data collection commenced. A digital information letter and consent form were provided to students on the homepage of the anonymous online survey before they agreed to answer the survey questions on a voluntary basis.

The study survey was sent to around 1500 students in the population from July to September 2019 and 505 responses were recorded, resulting in a response rate of around 25%. Of the 505 student respondents, around 44% of them enrolled in the English language program. The remaining were in the English language education program (28%), and bilingual language programs (28%). They were all scattered in different years of study, including the first year (25.5%), the second year (28%), the third year (32.5%), the fourth year (14%), and the fifth year for bilingual programs (1%). Almost all the students were female, comprising around 94% of the total responses.

Instrument

One online anonymous survey questionnaire was designed to gather data on students' perceptions and self-reported actual use of mobile technologies in language learning. Survey items were adapted from a standardized ICT survey previously used at an Australian university to investigate students' device ownership, internet accessibility and device real-life usage (Pagram et al., 2015). In addition, a number of items in surveys validated for mobile learning readiness and acceptance (Abdall & Hegazi, 2014; Christensen & Knezek, 2017; Lin et al., 2016; Parasuraman, 2000) were also adapted to investigate students' perceptions related to motivation, perceived usefulness of mobile learning, intention of use, and facilitating conditions (i.e., institutional support and environmental impacts).

The survey was comprised of five parts. The first part gathered basic demographic information about the university EFL students. The next part centred on their ownership of and accessibility to mobile devices and related mobile applications/technologies. The third part focused on students' self-reflection on their real-life behavioural use of mobile learning technologies in EFL learning. The fourth part investigated facilitating conditions which comprised institutional support and learning environment support for mobile learning. The final part of the survey examined students' perceptions of using mobile learning technology in language teaching/learning. The question types were various, including different types such as yes/no questions, multiple-choice questions, open-ended text responses, drag-and-drop questions, and slider-scale questions. For questions about opinions and attitudes, a slider scale with values ranging from 1 = "strongly disagree" to 4 = "strongly agree" was used for measurement.

Before the survey questionnaire was distributed to the respondents, they were evaluated and piloted to ensure the quality of question items and estimate measurement errors. Methods to evaluate draft survey questions suggested by Groves et al. (2009) were adopted, including expert review, focus group discussion, and piloting. Minor feedback from the expert review and focus group discussion included a better clarification of "daily" and "weekly" in the frequency scale, spelling mistakes, re-grouping of long lists of items, and more examples of mobile applications. The questionnaire was then revised

accordingly to eliminate ambiguous phrases, misleading presuppositions, and unclear questions for the next step of piloting. The final version of the survey was sent out for piloting. A group of 12 volunteers was recruited to pilot the online survey. A high value of Cronbach's alpha implies high reliability (Groves et al., 2009). The Alpha coefficient value for the whole survey was 0.803, indicating an acceptable level of reliability.

Survey Data Analysis

Variables were converted for analysis using labels. A database codebook was created to assist the analysis process. Descriptive statistics were calculated for variables of the survey. Crosstabulations were used to combine categories to find the general trends in the data as well as rating scales of agreement to disagreement (Cohen et al., 2011, p. 625). Data from the open-ended questions were refined; categories and subcategories of mobile technology preferences were identified, coded, and quantified. All statistical analyses of survey results were conducted with the assistance of Statistical Package for Social Sciences software (SPSS).

Findings

Students' Real-Life Use of Mobile Technologies in Language Learning

Mobile Device Ownership and Accessibility

Table 1 shows that almost all students (98.6%) owned smartphones. Laptops were the next commonly owned devices, accounting for 86.3%. Tablets, iPads, and wearable devices were not possessed by many students. Out of 505 respondents, only 16 students owned iPads, and 13 owned tablets. Other devices were specified as headphones and portable electronic dictionaries.

Table 1
Students' Mobile Device Ownership

Item	N	Percentage
Laptop	436	86.3%
Smartphone	498	98.6%
iPad	16	3.2%
Tablet	13	2.6%
Virtual Reality (VR) Headset	3	0.6%
Wearable devices (e.g., smartwatch, Google glass)	13	2.6%
Others	3	0.6%

Comparing the ownership of mobile devices among students by years of study, Table 2 reveals that students in all years of study had a similar percentage of smartphone ownership, ranging from 97% to 100%. A slight difference lies in the ownership of laptops across different years of study. First-year students seemed to have fewer laptops than students in other years of study, with only 66.7%.

Table 2
Laptop and Smartphone Ownership across Years of Study

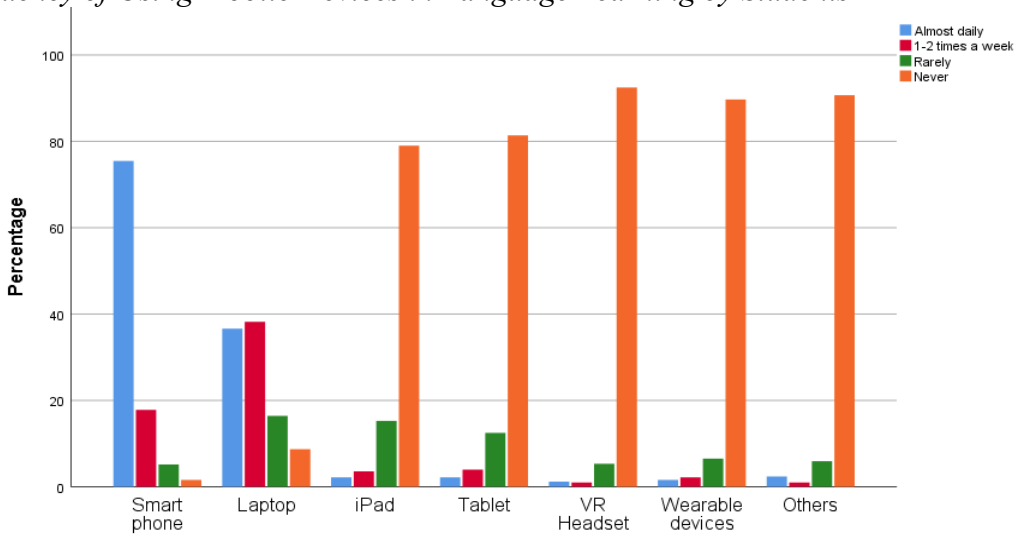
	First year		Second year		Third year		Fourth year		Fifth year	
	N	%	N	%	N	%	N	%	N	%
Laptop	86	66.7%	129	91.5%	155	94.5%	60	92.3%	6	100.0%
Smartphone	127	98.4%	138	97.9%	164	100.0%	63	96.9%	6	100.0%

Regarding the operating systems of the two most possessed devices, 39% of respondents reported that Windows was the operating system of their laptops, and the remaining either reported they did not know their devices' operating systems or did not provide specific information. For smartphones, Androids and iOS were both used by the students. However, the researcher only received responses from 27% of respondents for Android and 34% for iOS. The remaining did not provide specific information.

Concerning the length of device ownership, around two-thirds of the laptops and smartphones had been in students' possession between 1 and 2 years, 68% and 62%, respectively. Only a small percentage of devices had been purchased in less than one year, including laptops (8%) and smartphones (13%).

As far as the use of mobile devices in language learning is concerned, smartphones were the most frequently used, on an almost daily basis by nearly 80% of the students. Ranked second on an almost daily usage basis was laptops with nearly 40%. On a weekly basis, laptops turned out to be the most commonly used by nearly 40% of the students. The majority of the students (around 80-90%) never used iPads, tablets, and other devices for language learning purposes, as shown in Figure 1.

Figure 1
Frequency of Using Mobile Devices in Language Learning by Students



Due to the most popular use of smartphones, we investigated further the use of this device by students from different academic years. The result showed that all academic years used smartphones in language learning at a high frequency, with the mean values ranging from 3.60 to 3.83, as presented in Table 3.

Table 3
Frequency of Using Smartphones in Language Learning by Academic Years

Year of study	Mean	N	Std. Deviation
First year	3.66	129	.58
Second year	3.62	141	.71
Third year	3.75	164	.63
Fourth year	3.60	65	.68
Fifth year (Bilingual program)	3.83	6	.41

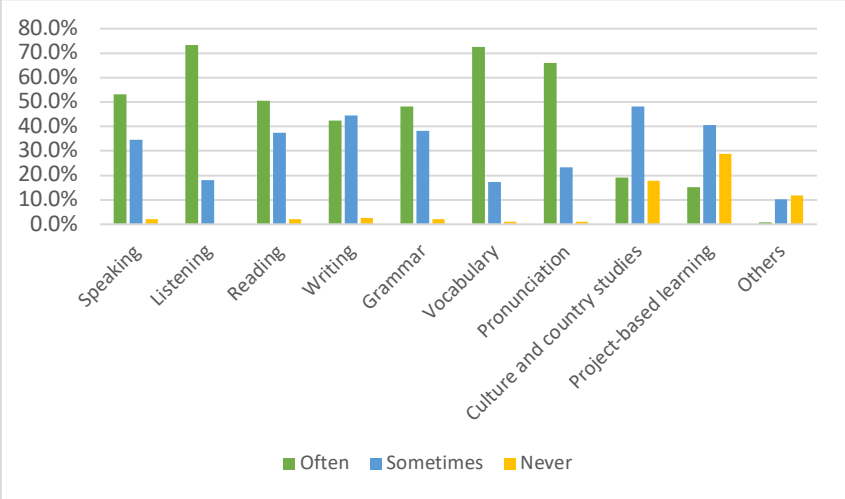
Note. 1 = never; 2 = rarely; 3 = 1-2 times per week; 4 = almost daily.

Regarding internet access, home internet and mobile internet (3G/4G) were the most frequently used on an almost daily basis, by 72% and 53% of the students, respectively. Internet provided by the institution, both wired and wireless, was also used by the students but at a small percentage of less than 20%.

Real-Life Use of Mobile Devices in Language Learning

As presented in Figure 2, mobile devices were used in nearly every area, with listening and vocabulary as the most popularly practised with mobile devices by more than 70% of students. Ranked the second most popular aspect was pronunciation with around 68% of respondents. Speaking, reading, and grammar were the three areas with a similar percentage of mobile device use - 50% more or less. Mobile devices were sometimes used in writing, culture, and country studies and projects, by 40% to 50% of the students. Other subjects, specified as translation and general subjects like Russian or Informatics, returned a small percentage of use by the students, with less than 10%.

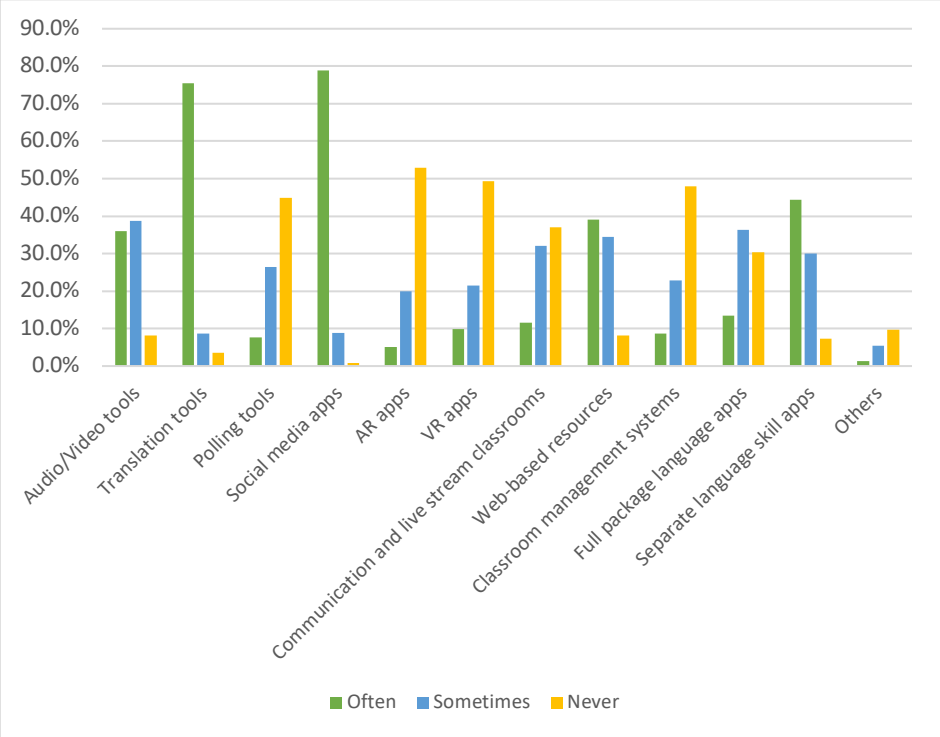
Figure 2
Frequency of Integrating Mobile Devices in Learning Subjects



Regarding the specific use of mobile applications in language learning, Figure 3 shows that almost all listed applications were used by the students but with different frequencies. Social media (70%) and translation applications (76%) were the most commonly used, followed by separate language skills applications (45%), web-based

resources with mobile support (39%) and audio/video making and editing tools (36%). Around half of the students reported never using AR (augmented reality) or VR (virtual reality) applications for language learning. Other applications were specified as music applications.

Figure 3
Frequency of Mobile Applications Used by Students



To further investigate students' use of mobile applications for language learning purposes, the respondents were asked to name the specific applications they most frequently used in real life in an open-ended question. Students' answers correspondently matched with their frequency of use of the mobile tools as described above. Dictionary and translation apps were most regularly utilized, including TFlat Dictionary, Google Translate, Oxford Dictionary, Cambridge Dictionary, and Vdict. Social media applications like Facebook, Zalo, and YouTube were also among the most frequently used applications. Language apps and websites were sometimes used, such as Busuu, Elsa, 123English.com, and Duolingo. BBC News and Tedtalk were used by a few students to support their listening practice. Regarding mobile applications that students had never used but wished to use in the near future, a number of students expressed a desire to use Drops and Mondly (two full language package apps), VR headsets, Skype, Rosetta Stone, or Quizlet. This was a good signal for the research because VR was on their wish list.

Students' Skills in Using Mobile Devices

Table 4 shows the results of students' self-evaluation of their skills in using mobile technologies for language learning. Mean values above the midpoint value of 2.50 indicate a high level of agreement. As seen in Table 4, most students reported they knew

how to use the in-built functions of the devices (M = 3.01) and download applications (*M* = 3.25). An average number of students also knew how to customize applications for their learning purposes (*M* = 2.54).

Table 4
Students' Skills of Using Mobile Technologies

Item	Mean	SD	Level
I know how to use in-built functions of mobile devices for language learning purposes (e.g., voice recording, voice recognition, camera, video editing, photo editing, etc.).	3.01	1.12	High
I know how to download applications for language learning purposes.	3.25	1.07	High
I know how to customize applications for language learning purposes (e.g., change the settings or design self-learning activities within the application).	2.54	1.27	Average

Note. 1 = Strongly disagree; 4 = Strongly agree

To further investigate the differences in skills of using mobile technologies across academic years, length of smartphone ownership, and the frequency of using smartphones (the most popularly used device) for language learning, the mean values of students' skills by these groups were compared. As presented in Table 5, the highest mean score of skills of using mobile technologies were reported by students in their last years of study (fourth year: *M* = 3.38; fifth year: *M* = 3.94), those who had owned smartphones the longest – more than four years (*M* = 3.56), and those who used smartphones almost daily for language learning (*M* = 3.36).

Table 5
Means Comparisons of Students' Skills of Using Mobile Devices

		Mean	SD
Year of study	First year	3.11	.832
	Second year	3.37	.724
	Third year	3.32	.736
	Fourth year	3.38	.806
	Fifth year (Bilingual program)	3.94	.136
	Total	3.30	.771
Length of smartphone ownership	Less than 1 year	3.18	.761
	1-2 years	3.26	.777
	3-4 years	3.36	.814
	More than 4 years	3.56	.586
	Total	3.30	.771
Frequency use of smartphones for language learning	Never	2.79	1.140
	Rarely	2.97	.759
	1-2 times a week	3.17	.787
	Almost daily	3.36	.750
	Total	3.30	.771

Students' Perceptions of Using Mobile Technologies in Language Learning

Students' Perceptions of Mobile Technologies

Descriptive analysis with mean values and standard deviation was used to investigate students' perceptions of using mobile technologies in EFL learning. Any mean value above the midpoint value of 2.50 indicates a high level of student agreement to the statements. As presented in Table 6, most of the respondents expressed positive attitudes toward mobile learning. Specifically, they showed a strong interest in using mobile learning technology (M = 3.40) and agreed that it was important for language practice (M = 3.40). They found mobile learning technology motivating (M = 3.31), flexible (M = 3.53), and helpful in improving language knowledge and skills (M = 3.28) as well as twenty-first century skills (M = 3.05). They agreed that mobile learning helped to create real-life language learning experiences (M = 2.90). Finally, they showed their willingness to update their mobile devices if mobile learning was officially approved in their institution (M = 3.12).

Table 6
Students' Attitudes towards Mobile Learning Technologies

Item	Mean	SD	Level
I am interested in using mobile learning technologies in language learning.	3.40	.91	High
Mobile learning technologies is important for language practice.	3.40	.91	High
It is motivating to use mobile learning technologies to learn a foreign language.	3.31	.94	High
Mobile learning technologies are flexible and allows me to study anywhere, anytime.	3.53	.84	High
I can improve my knowledge and language skills with mobile learning technologies.	3.28	.95	High
The use of mobile learning technologies helps me to develop 21st-century skills that are useful to me (e.g., communication, collaboration, creativity, critical thinking, and ICT skills).	3.05	1.0	High
Mobile learning technologies help me to be a more active language learner.	3.06	.95	High
Mobile learning technologies can help to create real-life language learning experiences.	2.90	1.0	High
I will upgrade my mobile device(s) if mobile learning is officially approved in my institution.	3.12	1.07	High

Note. 1 = Strongly disagree; 4 = Strongly agree

Table 7 presents the comparison of mean scores of students' attitudes toward mobile technologies among students from different academic years, having a varying length of smartphone ownership and different frequencies of using smartphones for language learning. The results show that those who had the highest mean scores in their positive attitudes toward mobile learning technologies were students in their last years of study (fourth year: M = 3.55; fifth year: M = 3.83), having owned smartphones more

than four years (M = 3.67), and using smartphones almost daily for language learning (M = 3.58).

Table 7
Means Comparisons of Students' Attitudes

		Mean	SD
Year of study	First year	3.57	.747
	Second year	3.57	.777
	Third year	3.49	.825
	Fourth year	3.55	.811
	Fifth year (Bilingual program)	3.83	.408
	Total	3.54	.786
Length of smartphone ownership	Less than 1 year	3.51	.848
	1-2 years	3.57	.750
	3-4 years	3.42	.904
	More than 4 years	3.67	.674
	Total	3.54	.786
Frequency of using smartphones in language learning	Never	3.50	1.069
	Rarely	3.26	.962
	1-2 times a week	3.47	.810
	Almost daily	3.58	.759
	Total	3.54	.786

Students' Perceptions of Facilitating Conditions

Regarding students' self-report on institutional support and learning environment, Table 8 shows that students had low opinions of facility conditions and technical support. They were not provided with enough mobile devices, strong internet access (M = 1.44), and IT team services (M = 1.39). However, the majority of them agreed that they had a good learning environment to support mobile learning. Specifically, students were encouraged by their peers (M = 3.16) and their teachers (M = 3.24) to use mobile technology to facilitate language learning activities after class. Students also reported that they were encouraged by their teachers to use mobile technology for in-class activities (M = 2.73).

Table 8
Students' Opinions about Institutional Support and Learning Environment

Item	Mean	SD	Level
My institution provides sufficient mobile devices for learning.	2.18	1.09	Low
The Internet access on campus is strong and reliable enough to use mobile technology.	1.44	1.15	Low
There is an IT team in my institution to provide timely and accessible help-desk support and online support.	1.39	1.16	Low
I am encouraged to use mobile technology to support language learning activities in class by my teachers.	2.73	1.04	High
I am encouraged to use mobile technology to support language learning activities after class by my teachers.	3.24	.99	High

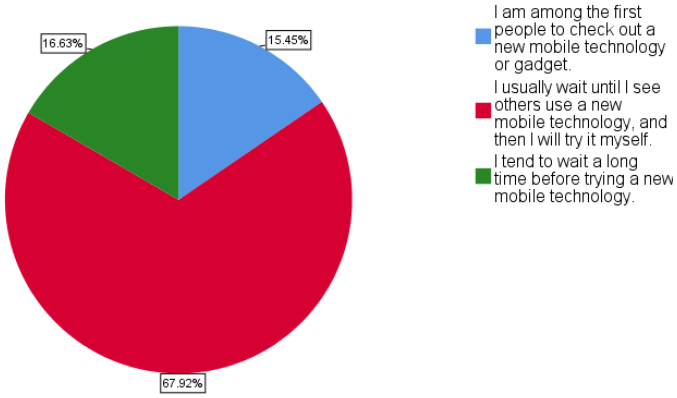
I am encouraged to use mobile technology to support language learning by my peers.	3.16	1.13	High

Note. 1 = Strongly disagree, 4 = Strongly agree

Students' Self-Description of their Technophile Level

Finally, students were asked to describe themselves to how much they welcomed new mobile technologies. Nearly 70% of the students considered themselves as "followers", waiting to see other people trying a new technology first before they tried it themselves. About 17% of the students saw themselves as "reserved" in trying new mobile technologies. Only a small percentage of 15.5% were reported as "pioneers" in checking out new mobile technologies or gadgets. The percentages were visualized in Figure 4. Details of percentages of students' self-descriptions across academic years of study, length of smartphone ownership, and frequency of using smartphones for language learning were presented in the Appendix.

Figure 4
Students' Self-Description of Technophile Level



Discussion

The study aimed to investigate EFL undergraduate students' perceptions and actual use of mobile technologies in language learning. The study results indicated an active real-life use of mobile technologies in language learning, as reported by EFL students. Most participants could afford mobile devices, mobile internet (3G/4G), and internet access at home. Smartphones were reported to be the most popular device used by students to learn English. This finding was not a surprise because according to the recent statistics of Vietnam (Churchill et al., 2018), mobile phone subscribers reached 152% of the population, and smartphones were considered the primary or sole means of internet access for many sections of the population. However, they frequently worked with basic and common applications such as social media apps and dictionary/translation

apps. This common use of social media (e.g., Facebook) in English language learning was also found in a number of studies conducted in other institutions in Vietnam and other Asian countries during the past decade (Farley & Song, 2015; Seraj et al., 2020; Tran, 2016; van Rensburg & La Thanh, 2017). The current study confirms that almost all students possessed mobile devices and used them for language learning purposes, but they had not had the opportunity to fully exploit the devices and mobile technologies for language learning. The use of more emerging and innovative mobile technologies was still not widespread among EFL students. Empirical evidence of effective mobile applications used in EFL learning is still limited in developing countries like Vietnam (Seraj et al., 2021).

The study finding also revealed students' high appreciation of the benefits of mobile technologies in language learning and had positive attitudes toward mobile learning. They frequently used mobile devices and technologies in language learning and were confident in using mobile learning technologies although this was constrained to commonly used applications, none of which could be considered innovative. These findings support those of a recent study that reported students' positive attitudes and motivation toward the use of mobile technology in EFL teaching at a university in Vietnam (Van Vo & Vo, 2020) and other contexts (Seraj et al., 2021; Shadiev et al., 2020). However, the survey results of the current study indicated that learners at public universities in Vietnam were not fully facilitated to use mobile technologies for language learning. The internet access provided by the institution was perceived as not strong and stable. This was understandable because Vietnam was among Asian countries with high mobile penetration but low internet broadband (Farley & Song, 2015). Although students reported shortcomings in the facilities provided by the university for mobile learning, they were encouraged by their teachers and peers to utilize mobile technologies in teaching and learning.

Most respondents expressed their eagerness to try emerging technologies like AR or VR, which was also predicted as a future trend in some Asian countries (Churchill et al., 2018; Farley & Song, 2015). Although participants were open and eager to try emerging mobile learning technologies, they needed more technical support and better infrastructure, including strong and reliable internet connections on campus. More importantly, they needed more guidance to use innovative mobile applications for language learning because most of them perceived themselves as followers, having the tendency to wait for others to lead them to use new technologies. Again, institutional support is significant in encouraging and enabling students to use mobile technologies in language learning (Maheshwari, 2021). This finding may also entail an implication for investment in professional development because teachers' confidence in using technologies and their pedagogies are important factors in encouraging students' effective use of technologies both inside and outside the classroom (Crompton & Burke, 2018; Seraj et al., 2021).

Conclusion

In conclusion, the study showed that EFL students at the selected institution were active in their real-life use of mobile technology for language learning. They perceived mobile technologies as useful and beneficial for language learning. They also held

positive attitudes toward mobile learning and were willing to try new mobile learning technologies. This is a potential signal for policymakers and educators to take advantage of students' own mobile devices, skills, and attitudes and make the most use of mobile affordances to design mobile-assisted language learning and promote language learning beyond the classroom. However, the finding that students' use was restricted to basic and common applications (i.e., social media and dictionary/translation), coupled with the reported challenges in technical support and facilitation conditions, indicates that the gaps in institutional support, knowledge, and infrastructure limit students' capacity to use innovative technologies. This needs to be addressed if teachers are to make the most of the unique affordances that mobile devices offer to language learners in Vietnam. This may also inform institution administrators to provide further technological support so that students have the opportunity to move beyond their basic use of mobile devices and be enabled to access innovative mobile technologies in language learning.

There are some limitations of the studies that need to be acknowledged. Due to the nature of the disciplines (i.e., language programs) which attracted more female than male students, female participants outnumbered their male peers. Therefore, it was impossible for the study to investigate the gender factor in different aspects related to students' mobile device usage and perceptions. Future studies may need to consider the gender balance in sampling to avoid this limitation. In addition, the study results mainly relied on an online survey instrument. Participants' personal opinions were not included to provide further explanations for the findings. Future research may consider including participants' insights to yield more comprehensive and insightful evidence. The data were collected before the COVID-19 pandemic so it may be significant for future studies to conduct a similar investigation to examine the changes in students' perceptions and real-life use of mobile devices after the emergency situation.

References

Abdall, H. M. E., & Hegazi, M. O. A. (2014). Mobile learning aspects and readiness. *International Journal of Computer Applications*, *103*(11), 22-28. https://doi.org/10.5120/18118-9401

Aeen, J. B., Riasati, M. J., & Zamanian, M. (2021). Recast, uptake, and learners' perception during video-based mobile-mediated interaction. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *22*(3), 107-125. http://www.callej.org/journal/22-3/Aeen-Rassaei-Riasati-Zamanian2021.pdf

Ahn, T. y., & Lee, S.-M. (2016). User experience of a mobile speaking application with automatic speech recognition for EFL learning. *British Journal of Educational Technology*, *47*(4), 778-786. https://doi.org/10.1111/bjet.12354

Ashburn, E. A., & Floden, R. E. (2006). *Meaningful learning using technology: What educators need to know and do*. Teachers College Press. https://www.tcpress.com/meaningful-learning-using-technology-9780807746844

Caldwell, M. (2018). Japanese university students' perceptions on the use of ICT and mobile-learning in an EFL setting. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *19*(2), 188-216. http://callej.org/journal/19-2/Caldwell2018.pdf

Christensen, R., & Knezek, G. (2017). Validating a mobile learning readiness survey: Assessing teachers' dispositions toward adoption. *Journal of Digital Learning in Teacher Education*, *33*(4), 148-159. http://dx.doi.org/10.1080/21532974.2017.1347536

Churchill, D., Pegrum, M., & Churchill, N. (2018). The implementation of mobile learning in Asia: Key trends in practices and research. In J. Voogt, G. Knezek, R. Christensen, & K.-W. Lai (Eds.), *Second handbook of information technology in primary and secondary education* (pp. 817-857). Springer International Publishing. https://doi.org/10.1007/978-3-319-53803-7_54-1

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed.). Routledge. https://doi.org/10.4324/9780203224342

Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, *123*(April), 53-64. https://doi.org/10.1016/j.compedu.2018.04.007

Farley, H., & Song, H. (2015). Mobile learning in Southeast Asia: Opportunities and challenges. In Y. Zhang (Ed.), *Handbook of mobile teaching and learning* (pp. 403-419). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-54146-9_2

Fithriani, R. (2021). The utilization of mobile-assisted gamification for vocabulary learning: Its efficacy and perceived benefits. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *22*(3), 146-163. http://callej.org/journal/22-3/Fithriani2021.pdf

González-Lloret, M. (2017). Technology for task-based language teaching. In C. A. Chapelle & S. Sauro (Eds.), *The Handbook of technology and second language teaching and learning*. John Wiley & Sons, Inc. https://doi.org/10.1002/9781118914069.ch16

Government of Vietnam. (2017). *Decision No.117 on the approval of Project "ICT Emhancement in Administration and Teaching-Learning Support, Scientific Research to Improve the Quality of Education and Training" period 2016-2020, with 2025 orientation*. Government of Vietnam.

Gray, D. E. (2009). *Doing research in the real world* (2nd ed.). Sage. https://in.sagepub.com/sites/default/files/upm-assets/58626_book_item_58626.pdf

Groves, R. M., Fowler, F. J., Couper, M., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Wiley. http://public.eblib.com/choice/publicfullrecord.aspx?p=819140

Ha, M.-J. (2020). Implementing mobile-phone-based student response system in a large undergraduate course. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *21*(3), 122-139. http://www.callej.org/journal/21-3/Ha2020.pdf

Hoang, D., & Nguyen, N. (2019). Mobile augmented reality activities in EFL classrooms at a Vietnamese university from the students' perspective. *The Journal of AsiaTEFL*, *16*(1), 411-419. http://dx.doi.org/10.18823/asiatefl.2019.16.1.31.411

Hoang, D., Tran, T., Nguyen, N., & Nguyen, L. (2020). Digital citizenship awareness in EFL context in Vietnam: A project evaluation. *The Journal of AsiaTEFL*, *17*(1), 225-233. https://doi.org/10.18823/asiatefl.2020.17.1.14.225

Hoang, D. T. N., McAlinden, M., & Johnson, N. F. (2022). Extending a learning ecology with virtual reality mobile technology: Oral proficiency outcomes and students'

perceptions. *Innovation in Language Learning and Teaching*, 1-14. https://doi.org/10.1080/17501229.2022.2070626

Khanh, N. T. V., & Gim, G. (2014). Factors influencing mobile-learning adoption intention: An empirical investigation in high education. *Journal of Social Sciences*, *10*(2), 51-62. https://doi.org/10.3844/jssp.2014.51.62

Khansarian-Dehkordi, F., & Ameri-Golestan, A. (2016). Effects of mobile learning on acquisition and retention of vocabulary among Persian-speaking EFL learners. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *17*(2), 43-56. http://www.callej.org/journal/17-2/Khansarian-Dehkordi_Ameri-Golestan 2016.pdf

Kolb, L. (2008). *Toys to tools: Connecting student cell phones to education*. International Society for Technology in education. https://www.worldcat.org/title/toys-to-tools-connecting-student-cell-phones-to-education/oclc/234424997

Kukulska-Hulme, A., & Viberg, O. (2018). Mobile collaborative language learning: State of the art. *British Journal of Educational Technology*, *49*(2), 207-218. https://doi.org/10.1111/bjet.12580

Lee, C. (2020). Intention to use versus actual adoption of technology by university English language learners: what perceptions and factors matter? *Computer Assisted Language Learning*, 1-29. https://doi.org/10.1080/09588221.2020. 1857410

Lin, H.-H., Lin, S., Yeh, C.-H., & Wang, Y.-S. (2016). Measuring mobile learning readiness: scale development and validation. *Internet Research*, *26*(1), 265-287. https://doi.org/10.1108/IntR-10-2014-0241

Luo, Y., & Watts, M. (2022). Exploration of university students' lived experiences of using smartphones for English language learning. *Computer Assisted Language Learning*, 1-26. https://doi.org/10.1080/09588221.2022.2052904

Maheshwari, G. (2021). Factors affecting students' intentions to undertake online learning: An empirical study in Vietnam. *Education and Information Technologies*. https://doi.org/10.1007/s10639-021-10465-8

McCrory, R. S. (2006). Technology and teaching: A new kind of knowledge. In F. R. E. Ashburn E. A. (Ed.), *Meaningful learning using technology - What educators need to know and do*. Teachers College Press. https://www.tcpress.com/ meaningful-learning-using-technology-9780807746844

McQuiggan, S., Kosturko, L., McQuiggan, J., & Sabourin, J. (2015). *Wiley and SAS business series: Mobile learning: A handbook for developers, educators, and learners*. John Wiley & Sons. https://tinyurl.com/34wydfh8

Ministry of Education and Training. (2016). *Decision No.6200 on the Approval of the ICT Plan period 2016-2020 of the Ministry of Education and Training.* Ministry of Education and Training. Decision No.6200.

Murphy, A., Farley, H., Dyson, L. E., & Jones, H. (2017). *Mobile learning in higher education in the Asia-Pacific region*. Springer. https://link.springer.com/content/ pdf/10.1007/978-981-10-4944-6.pdf

Murphy, A., Midgley, W., & Farley, H. (2014). *Mobile learning trends among students in Vietnam* [Conference presentation]. International Conference on Mobile and Contextual Learning, Istanbul, Turkey. https://link.springer.com/chapter/ 10.1007/978-3-319-13416-1_18

Nguyen, G., & Dang, D. (2012). *Mobile learning in Vietnam - Opportunities and challenges* [Conference presentation]. Southeast Asian Open and Distance Learning in the 21st Century, Hanoi, Vietnam. http://dx.doi.org/10.13140/2.1.2405.2167

Nguyen, H., & Pham, T. (2020). *Is COVID-19 an opportunity to strengthen online teaching?* https://www.universityworldnews.com/post.php?story=20200512154252178

Nguyen, M. N. (2022). *Smartphone market in Vietnam - Statistics & facts*. Statista. https://www.statista.com/topics/9168/smartphone-market-in-vietnam/#topicHeader__wrapper

Pagram, J., Cooper, M., Vonganusith, V., & Gulatee, Y. (2015). *Tom Yum Tech: An international examination of university student ICT ownership and use for study in both Thailand and Australia* [Conference presentation]. International Conference on Education Innovation ICEI 2015, Chiang Mai, Thailand. https://ro.ecu.edu.au/ecuworkspost2013/7075/

Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, *2*(4), 307-320. https://doi.org/10.1177/109467050024001

Pegrum, M. (2014). *Mobile learning: Languages, literacies and cultures*. Palgrave Macmillan. https://doi.org/10.1057/9781137309815

Pence, H. E. (2010). Smartphones, smart objects, and augmented reality. *The Reference Librarian*, *52*(1-2), 136-145. https://doi.org/10.1080/02763877.2011.528281

Pfeiffer, V. D. I., Gemballa, S., Jarodzka, H., Scheiter, K., & Gerjets, P. (2009). Situated learning in the mobile age: mobile devices on a field trip to the sea. *ALT-J*, *17*(3), 187-199. https://doi.org/10.1080/09687760903247666

Pham, T. N., & Lai, P. H. (2022). Usage and acceptance of mobile devices for English language learning by Vietnamese teenagers. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *23*(1), 466-491. http://callej.org/journal/23-1/Pham-Lai2022.pdf

Rad, H. S. (2021). Exploring use of mobile-mediated hybrid dynamic assessment in improving EFL learners' descriptive writing skills. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *22*(1), 111-127. http://callej.org/journal/22-1/Rad2021.pdf

Şad, S. N., Özer, N., Yakar, Ü., & Öztürk, F. (2020). Mobile or hostile? Using smartphones in learning English as a foreign language. *Computer Assisted Language Learning*, 1-27. https://doi.org/10.1080/09588221.2020.1770292

Seraj, P. I., Habil, H., & Hasan, K. (2020). Investigating EFL learners' readiness of using smartphone and problems for learning oral English communication skills at tertiary level in an EFL context. *International Journal of Interactive Mobile Technologies (IJIM)*, *14*(10), 148–163. https://doi.org/10.3991/ijim.v14i14.14759

Seraj, P. M. I., Klimova, B., & Habil, H. (2021). Use of mobile phones in teaching English in Bangladesh: A systematic review (2010–2020). *Sustainability*, *13*(10), 5674. https://doi.org/10.3390/su13105674

Serdyukov, P. (2017). Innovation in education: What works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*, *10*(1), 4-33. https://doi.org/10.1108/JRIT-10-2016-0007

Shadiev, R., Liu, T., & Hwang, W. Y. (2020). Review of research on mobile-assisted language learning in familiar, authentic environments. *British Journal of Educational Technology*, *51*(3), 709-720. https://doi.org/10.1111/bjet.12839

Sung, Y.-T., Chang, K.-E., & Liu, T.-C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, *94*(2016), 252-275. https://doi.org/10.1016/j.compedu.2015.11.008

Tran, P. (2016). Training learners to use Quizlet vocabulary activities on mobile phones in Vietnam with Facebook. *JALT CALL Journal*, *12*(1), 43-56. https://eric.ed.gov/?id=ej1107943

Tri, D. H., & Nguyen, N. H. T. (2014). An exploratory study of ICT use in English language learning among EFL university students. *Teaching English with Technology*, *14*(4), 32-46. https://files.eric.ed.gov/fulltext/EJ1143398.pdf

van Rensburg, H., & La Thanh, T. (2017). Teachers' use of Facebook motivating Vietnamese students to improve their English language learning. In A. Murphy, H. Farley, L. E. Dyson, & H. Jones (Eds.), *Mobile learning in higher education in the Asia-Pacific region: Harnessing trends and challenging orthodoxies* (pp. 359-375). Springer Singapore. https://doi.org/10.1007/978-981-10-4944-6_18

Van Vo, L., & Vo, L. T. (2020). EFL Teachers' attitudes towards the use of mobile devices in learning English at a university in Vietnam. *Arab World English Journal*, *11*(1). https://doi.org/10.24093/awej/vol11no1.10

Viet Nam News. (2017). Smartphone users cover 84% of VN population. https://vietnamnews.vn/economy/418482/smartphone-users-cover-84-of-vn-population.html#xVfMCVf22PlLjc9O.97

Vo, N. H. (2020). Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. *Computers & Education*, *146*(2020), 1-15. https://doi.org/10.1016/j.compedu.2019.103761

Vu, N. N. (2016). Mobile learning in language teaching context of Vietnam: An evaluation of students' readiness. *Tạp chí Khoa học*(7), 16. https://journal.hcmue.edu.vnindex.php/hcmuejos/article/view/431

Wu, J. G. (2019). The use of mobile devices in language learning: A survey on Chinese university learners' experiences. *Computer Assisted Language Learning-Electronic Journal (CALL-EJ)*, *20*(3), 6-20. http://callej.org/journal/20-3/Wu2019.pdf

Yu, J., Zhou, X., Yang, X., & Hu, J. (2022). Mobile-assisted or paper-based? The influence of the reading medium on the reading comprehension of English as a foreign language. *Computer Assisted Language Learning*, *35*(1-2), 217-245. https://doi.org/10.1080/09588221.2021.2012200

Yu, Z., Yu, L., Xu, Q., Xu, W., & Wu, P. (2022). Effects of mobile learning technologies and social media tools on student engagement and learning outcomes of English learning. *Technology, Pedagogy and Education*, 1-18. https://doi.org/10.1080/1475939X.2022.2045215

Zhang, D., & Perez-Paredes, P. (2021). Chinese postgraduate EFL learners' self-directed use of mobile English learning resources. *Computer Assisted Language Learning*, *34*(8), 1128-1153. https://doi.org/10.1080/09588221.2019.1662455

Zheng, Y., Wei, R., & Nekmat, E. (2016). Asian mobile communication research: current status, enduring issues and future trends. *Asian Journal of Communication*, *26*(6), 532-547. https://doi.org/10.1080/01292986.2016.1227996

Appendix

Percentage Comparisons of Students' Self-Description of Technophile Level

			Pioneers	Followers	Reserved	Total
Year of study	First year	Count	23	77	29	129
		%	17.8%	59.7%	22.5%	100.0%
	Second year	Count	14	105	22	141
		%	9.9%	74.5%	15.6%	100.0%
	Third year	Count	28	112	24	164
		%	17.1%	68.3%	14.6%	100.0%
	Fourth year	Count	12	44	9	65
		%	18.5%	67.7%	13.8%	100.0%
	Fifth year (Bilingual program)	Count	1	5	0	6
		%	16.7%	83.3%	0.0%	100.0%
	Total	Count	78	343	84	505
		%	15.4%	67.9%	16.6%	100.0%
Length of smartphone ownership	Less than 1 year	Count	11	35	11	57
		%	19.3%	61.4%	19.3%	100.0%
	1-2 years	Count	44	210	57	311
		%	14.1%	67.5%	18.3%	100.0%
	3-4 years	Count	17	64	11	92
		%	18.5%	69.6%	12.0%	100.0%
	More than 4 years	Count	6	34	5	45
		%	13.3%	75.6%	11.1%	100.0%
	Total	Count	78	343	84	505
		%	15.4%	67.9%	16.6%	100.0%
Frequency of using smartphones for language learning	Never	Count	1	7	0	8
		%	12.5%	87.5%	0.0%	100.0%
	Rarely	Count	4	18	4	26
		%	15.4%	69.2%	15.4%	100.0%
	1-2 times a week	Count	8	57	25	90
		%	8.9%	63.3%	27.8%	100.0%
	Almost daily	Count	65	261	55	381
		%	17.1%	68.5%	14.4%	100.0%
	Total	Count	78	343	84	505
		%	15.4%	67.9%	16.6%	100.0%