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Usage and Acceptance of Mobile Devices for English Language Learning by Vietnamese Teenagers

Thach Ngoc Pham (thachpn@hanu.edu.vn)
Hanoi University, Vietnam

Phuong Hoai Lai (lhphuong@hanu.edu.vn)
Hanoi University, Vietnam

Abstract

Teenagers all over the world are living in a digitalized society with extensive exposure to digital technology. Their attitudes towards and behavior in using digital technology and devices for learning have become a subject of studies over the past decades. This quantitative study adopted the unified theory of acceptance and use of technology (UTAUT) model to examine Vietnamese teenagers' usage and acceptance of mobile devices for language learning. Survey data from 655 school and university students were analyzed by independent sample t-tests and the partial least squares structural equation modelling (PLS-SEM) technique. Findings revealed that teenagers used mobile devices more for entertainment and information search than for online learning, and there were statistical differences between school and university, rural and urban, English and non-English majors in their usage of mobile devices (mainly smartphones) for online learning. Results of the PLS-SEM analysis indicated that the total effects of all paths to attitude towards use were positive, implying that all relationships in the proposed model explained students' attitudes on the use of mobile devices for English language learning. The study findings offer useful implications for teachers and software designers in promoting the use of mobile devices for English language learning in Vietnam.

Keywords: Teenagers, Mobile devices, Acceptance, UTAUT, Vietnam

Introduction

Vietnam is growing rapidly as an emerging economy, and over the past decade, the number of Internet users has also increased rapidly. According to the latest statistics, the country has 64 million Internet users, the majority of whom (96%) access the Internet through mobile devices (mostly smartphones) (MMA, 2020; Vnetwork, 2019). However, smartphone owners mostly use their devices to chat, access social media and read news, not much for learning (Thach et al., 2021). It was not until the outbreak of Covid-19 that students had to study online using all the devices they had at their disposal, the majority of which were smartphones, laptops, or tablets.

This study aimed to explore how mobile devices were used for English language learning in Vietnam - a developing country where there is still little research on the

adoption of mobile devices for learning in general and language learning in particular. In the country, the use of smartphones during formal lessons, especially at the high school level, is still controversial because most teachers and parents fear that they may not have any control over what students do with those devices (Kim, 2020). When the students are outside the classroom, they tend to use smartphones mainly for communication and entertainment purposes (Thach et al., 2021). This study expands the unified theory of acceptance and use of technology (UTAUT) proposed by Venkatesh et al. (2003) to investigate Vietnamese teenagers' intention to mobile language learning. The two research questions for the current study are:

Q1: What are the purposes of using mobile devices for Vietnamese teenagers? What were the impacts of demographic features on their usage?
Q2: To what extent do Vietnamese teenagers adopt mobile devices for English language learning?

Review of Literature

MALL and MELL

Since the first discussions on MALL, a lot of research has been conducted on its benefits and acceptance by various groups of learners and teachers at the school and university levels (Hoi & Mu, 2021; Maheshwari, 2021; Tran, 2020). Regarding the benefits of MALL, past studies have revealed that mobile devices enable learners to study languages anywhere, anytime, and at the same time increased their motivation, collaboration, and learning outcomes (Kukulska-Hulme, 2018; Fu & Hwang, 2018; Baydas & Yilmaz, 2018). Studies on MALL have also indicated a strong acceptance by both learners and teachers in using mobile devices for language learning due to their usefulness, ease of use, playfulness, etc., (Mekhzoumi et al., 2018; Tran, 2020). These studies show that, on the one hand, mobile devices promote autonomous learning, and on the other, teachers' support is needed to encourage learners to engage more committedly in the learning process for better outcomes (Hoi & Mu, 2021).

Studies on mobile English language learning (MELL) shared the aforementioned features of using mobile devices for learning English but further investigated how they (mobile devices) could enhance English learners' language proficiency (Elaish et al., 2019; Tran, 2020). A comprehensive review of studies on MELL (Elaish et al., 2019) indicated that nearly half of the reviewed research from 2010 to 2015 was on all language skills; the other half was on either one or two skills only, for example, vocabulary (over 20%), listening and reading (7.25%), speaking and writing (5.8% and 4.35%, respectively). Learners' reading and listening skills could be enhanced thanks to the availability of e-book readers, software, podcasts, and audio channels. In contrast, speaking skills could be sharpened with the use of pronunciation software, speech recognition engines, and learners' ability to record, edit, and oral exchange performance (Kirsch, 2016).

Despite the above advantages, there are some negative issues concerning the use of mobile devices for learning. First, the small screen size can cause difficulties for learners to practice macro skills such as writing or reading at an advanced level when

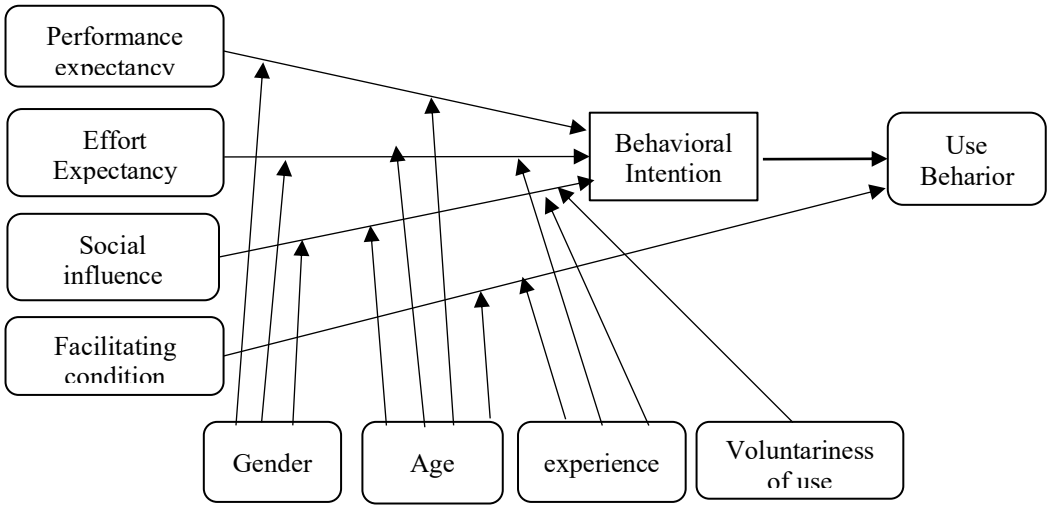
long texts are presented (Kukulska-Hulme, 2018). In addition, constraints in editing a text on mobile devices may discourage the learners from learning writing. Second, learners can be easily distracted while learning with mobile devices (Hashim et al., 2017). This was because young learners tend to register as users or members of many social networks such as Facebook, Instagram, Zalo, and virtual groups. New feeds and messages from these networks and groups may attract more of the learners' interest than learning. Third, in terms of pedagogical constraints, mobile learning is learner-centered and requires strong learning autonomy from the students. However, learners tend to be passive in using technology outside the class for language learning (Lai et at., 2015).

Many studies have also been conducted in Vietnam, most of which investigated learners' and teachers' acceptance of using mobile devices for language learning, especially English (Nguyen, 2016; Doan, 2018; Hoi & Mu, 2021; Tran, 2020). Nguyen's (2016) study indicated that ease of use was not a significant indicator of behavioral intention (BI), which could be explained by learners' higher skills in using mobile devices, especially smartphones. The devices have become very popular among youth, and it is assumed that smartphones are easy to use by this group of users. A study by Hoi and Mu (2021) showed the important role of teacher support in students' mobile learning. Although Vietnamese learners were ready, excited, and supportive of mobile learning (of English), they need teachers' motivation, encouragement, and recommendations to adopt mobile devices for learning (Doan, 2018; Tra, 2020). This was explained by the traditional top-down models of teaching and learning in Vietnam (Hoi & Mu, 2021). Tran's (2020) qualitative study shared similar findings, which stated that mobile learners much-appreciated instructor feedback. Tran's study also suggested a need to provide regular, clear, and brief reminders to language learners (p.55).

The UTAUT

Studies on the acceptance of using mobile learning have used the technology acceptance model (TAM) proposed by Davis (1989). However, due to some of its shortcomings, such as oversimplification and lack of emphasis on system characteristics (Bagozzi, 2007; Dishaw & Strong, 1999), a unified theory of acceptance and use of technology (UTAUT) was proposed, with the combination of eight acceptance models (Venkatesh et al., 2003). The UTAUT model is presented in Figure 1.

Figure 1
The UTAUT Model by Venkatesh et al. (2003)



The four main constructs of the UTAUT model are performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). These four constructs have impacts on BI (behavioral intention) and then the actual use behavior of learners (Venkatesh et al., 2003)). Although this model is gaining popularity in research on online learning, evidence from recent research shows that other constructs should be taken into consideration, such as attitudes towards using (ATT), which is the most important factor influencing learners' intention and actual use of mobile learning (Botero et al., 2018; Lin et al., 2020; Park et al., 2014; Sukendro et al., 2020). In addition, later research projects using TAM models have added other specific constructs (e.g., self-management of learning, institutional support, enjoyment) which have a significant influence on BI, directly or indirectly through ATT (Barrett et al., 2021; Maheshwari, 2020; Park et al., 2014).

In terms of research methods, most UTAUT-based studies have used questionnaires as the main data collection tool and structural equation modelling (SEM) as the main data analytical technique. However, Rasch analysis was preferred by Hoi and Mu (2020) over the conventional confirmatory factor analysis (CFA). This aims to overcome the limitations of treating Likert scale responses as linear intervals and the "consistency with which respondents endorse the response categories" (Hoi & Mu, 2020, p. 887). More recently, due to the excessive use of the UTAUT model in mobile learning, partial least square structural equation modelling (PLS-SEM) was used to conduct a confirmatory test of the extended model (Barrett et al., 2021; Sukendro et al., 2020). PLS-SEM was one of the data analytical techniques employed in this study.

What is missing is a report that gives a more rounded account of the research and provides a complete account not only of what learners say (i.e., in surveys) but why they are saying it (i.e., in interviews) or what they are actually doing (i.e., observation of actual use). This study started by investigating teenagers' usage and acceptance of mobile learning through a survey. Then semi-structured interviews were conducted to examine some of the issues that arose more thoroughly some of the issues; for example, which language skills could be enhanced through mobile devices, and how, if applicable. Based on the findings from this study, software was designed software, tried with the target learners, and then their opinions were collected again through both survey questionnaires and interviews. However, within the scope of this paper, only the results of analyzing quantitative data collected from a survey about teenagers' usage and acceptance of MELL were reported.

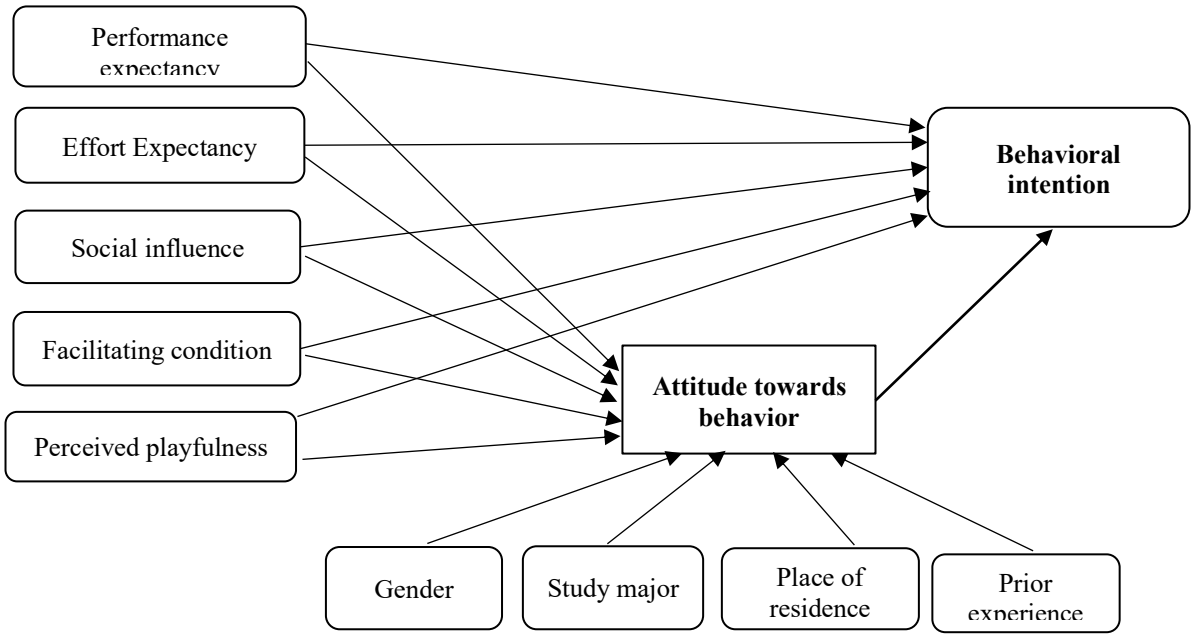
As mentioned earlier, a few UTAUT-based studies of MELL have been carried out in the Vietnamese context (Doan, 2018; Hoi & Mu, 2021; Tra, 2020; Tran, 2020). In this study, the questionnaire items were adopted from the aforementioned and other similar studies on acceptance, the convenience of technology in English learning, and acceptance in developing countries (Chang et al., 2012; Thomas et al., 2013; Tan, 2013). In addition, this study aimed at confirming some of the hypotheses which were tested in previous studies about MELL in the Vietnamese context. In other words, based on the theoretical soundness and empirical support presented so far, this study expanded the UTAUT model to explore the usage and verify the acceptance of mobile devices for English language learning by Vietnamese teenagers.

Research Method

Research Framework

This study used the interrelationships within the UTAUT model proposed by Venkatesh et al. (2003). It, however, did not include the use behavior variable because most of the participants had not used mobile devices for formal learning before. Nonetheless, it extended the causal relationships by including the perceived playfulness (PP) construct and participants' gender, the purpose of using mobile devices, place of residence, and prior experience with online English language learning. Figure 2 presents the proposed research model that explains the use of MALL and the hypothesized relationships between the variables.

Figure 2
Proposed Research Model



This proposed research model indicates that all original constructs (PE, EE, SI, FC, and PP) are positively related to both ATT and BI. The model also proposes the hypothesis that learners' gender, study major (English and non-English), place of residence, and prior experience with mobile English language learning have effects on the samples' ATT, which would, in turn, be positively related to BI.

Participants

Purposive sampling was used to approach participants. The participants understood that they took part in the study entirely voluntarily. In March 2021, the survey was administered face-to-face with high school and university students in the north,

central, and south of Vietnam (both rural and urban areas). The participants were given the paper-based questionnaire during the in-class time to be completed after class hours. However, due to the fourth outbreak of COVID-19 in April and May, the survey was conducted online through Google Forms. Two groups of undergraduate university students were deliberately chosen: English and non-English majors. While the first group included those in the disciplines of English language studies (e.g., linguistics, interpreting, and translation), the second one was comprised of students in history, graphic design, etc. For the latter group, English was only one of the subjects in their curriculum. In the end, 655 students completed the questionnaire. The data was cleaned by deleting incomplete and non-valid answers, leaving 617 usable (374 school and 243 university students) responses for data analysis. Table 1 illustrates the general information of the respondents.

Table 1

Respondents' Characteristics

Information	**High School**		**University**		**Total**	
	No	*%*	*No*	*%*	*No*	*%*
Gender						
Female	221	40.9	161	66.3	382	61.9
Male	153	59.1	82	33.7	235	38.1
Device ownership						
Smartphone	350	93.6	234	96.3	584	94.7
Tablet	24	6.4	9	3.7	32	5.3
Internet connection						
Wi-Fi	311	83.2	201	82.7	512	83.0
3G/4G/5G	63	16.8	42	17.3	105	17.0
Place of residence						
Urban	196	52.4	124	51.0	320	51.9
Rural	178	47.6	119	49.0	297	48.1
Major (undergraduate)						
English	NA	NA	127	20.6	127	52.2
Non-English	NA	NA	116	18.6	116	47.8
Prior experience in online English language learning						
Yes	98	48.3	105	51.7	203	32.9
No	276	66.7	138	33.3	414	67.1

Data in Table 1 shows some basic information about the participants. First, the vast majority of the learners (94.7%) used smartphones, and most of them connected to the Internet via Wi-Fi (83%). There was only a small difference between the percentages of participants residing in urban (51.9%) and rural areas (48.1%) and between English and non-English majors (52.2% and 47.8%, respectively). The proportion of learners with prior experience in online English language learning was only 32.9%, compared to 67.1% with none.

Instrument

A MELL questionnaire was developed with relevant demographic variables, purposes of using mobile devices, and seven constructs in a 5-point Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree) of the UTAUT model (Venkatesh

et al., 2003). The questions were translated into Vietnamese and checked by language teachers trained in English and Vietnamese. It was then commented on for clarity in a group discussion with Vietnamese nationals, and some modifications were made. For example, the term "a smartphone or tablet" in the original questionnaire was replaced by "mobile devices" for the sake of simplicity. Similarly, the vague English term "academic performance" was translated into "kết quả học tập" (study results). In addition, the use of bold letters was applied for the sake of differentiation, for example, between mobile devices and mobile applications.

The questionnaire was then piloted on 81 school and university students in both rural and urban areas in Vietnam. While completing the questionnaire, they were also invited to comment on the wording and clarity of the items. Minor changes were further made following their comments. For instance, the 36 items of the UTAUT model were grouped into seven constructs to increase clarity for respondents (see Appendix 1). A check on the reliability of the constructs yielded Cronbach's alpha levels from 0.656 to 0.899 for the seven constructs of the model.

Data Analysis

To answer the research questions of this study, two main analytical methods, namely independent sample t-tests and partial least square structural equation model (PLS-SEM), were employed. First, after analyzing frequencies of mobile device usage, independent sample t-tests were used to assess the usage differences among Vietnamese teenagers. Independent-samples t-test is a technique that explores statistically significant differences in the mean scores for two groups of participants. More specifically, the study explored if there were statistically significant differences between males and females; school and university students; rural and urban learners; and English and non-English majors in their prior experience in online English language learning and their usage of mobile devices for learning, among other purposes.

Concerning the second question of the study, i.e., verifying statistically the acceptance of mobile devices for English language learning by Vietnamese teenagers, the PLS-SEM technique, developed by Wold (1975) was employed. The model aimed to maximize the endogenous constructs' explained variance and minimize their error terms (Hair et al., 2018). Besides, PLS is a better choice in case convergence issues with formative models exist (Hair et al., 2017). In addition, PLS is often a preferred tool when constructs in the model are measured both reflectively (indicators are caused by factors) and formatively (indicators define factors) (Hair et al., 2017). For example, in this paper, ATT is measured reflectively, while SI is measured formatively. PLS-SEM was also the preferred analytical method. It works best when the attitude is included in the model (Lopez-Bonilla & Lopez-Bonilla, 2017) and is deemed more appropriate in exploratory studies investigating causal relationships among constructs (Hair et al., 2018).

Findings

Usage of Mobile Device

To answer the first question about the usage of mobile devices among the

participants, frequency analyses of the purposes were conducted, and then independent sample t-tests were employed to explore the differences in the participants' usage of the devices for online learning. Table 3 presents the respondents' purposes of using mobile devices.

Table 3
Purpose of Using Mobile Devices

			Frequency				
Purpose	**M**	**SD**	*Never*	*Rarely*	*Sometimes*	*Often*	*Always*
Social network	4.26	0.72	0.6	1.8	7.0	52.5	38.1
Information search	4.23	0.73	0.2	1.9	10.9	49.1	37.9
Entertainment	3.96	0.70	0.3	1.6	19.6	58.2	20.3
Graphics shoot	3.59	0.98	1.6	12.6	29.0	38.7	18.0
News update	3.52	0.93	1.5	12.0	34.5	37.6	14.4
Email	3.15	1.00	2.9	25.0	35.7	26.7	9.7
Online shopping	2.90	1.04	8.1	27.9	37.6	18.8	7.6
Online learning	2.64	1.04	18.8	19.4	42.9	16.2	2.6

Data in Table 3 shows that browsing social networks and the Internet to search for information were the two most popular aims (M = 4.26 and 4.23, respectively) while online shopping and online learning ranked the lowest (M = 2.90 and 2.64, respectively). Other purposes, including entertaining, taking photos, updating news, and communicating via email, had a high frequency of usage among the participants. An independent sample t-test was performed to see if there were differences between high school students and the undergraduate in their usage of mobile devices. The results revealed a statistically significant difference ($p < 0.05$) between these two groups of learners for the following purposes: online learning, online shopping, getting news updates, and using email. University students tended to use the devices more than their younger counterparts for the above purposes.

As this study focused mainly on using mobile devices for mobile learning, especially English language learning, another independent sample t-test was also applied to explore the differences between school and university students, those living in urban and rural areas, and English and non-English majors with regard to prior experience in online English language learning and usage of mobile devices for this purpose. Table 4 shows the difference in students' prior experience in online English language learning.

Differences in Prior Online English Language Learning

Table 4
Differences in Prior Online English Language Learning

		N	**M**	**SD**	**t**	**Sig. (2 tailed)**	**Mean difference**	**Lower**	**Upper**
Target learners	*Uni. Ss*	243	1.43	0.50	4.34	0.00	0.12	0.09	0.25
	School Ss	374	1.26	0.44					
Place of residence	*Urban*	320	1.39	.488	3.24	0.001	0.17	0.05	0.20
	Rural	297	1.27	.443					
Study major	*Non-English*	116	1.34	0.47	-2.93	0.004	-0.18	-0.31	-0.06

	English	127	1.52	0.50					

Data in Table 4 shows that there is a significant difference in scores for university students (M = 1.43; SD = 0.50) and high school students (M = 1.26, SD = 0.45; t(617) = 4.34; p = 0.00, two-tailed). It appears that university students had more experience with online English language learning than high school students. However, the magnitude of the differences in the means (MD = 0.12, 95% CI: 0.09 - 0.25) is very small (eta squared = 0.03). Similarly, there is a significant difference in scores for urban participants (M = 1.39; SD = 0.49) and rural ones (M = 1.27, SD = 0.47; t(617) = 3.24; p = 0.001, two-tailed). It is shown that urban students had more experience with online English language learning than rural ones. The magnitude of the differences in the means (MD = 0.17, 95% CI: 0.09 to 0.25) is very small (eta squared = 0.02). Finally, there is a significant difference in scores for non-English majors (M = 1.34; SD = 0.47) and English majors (M = 1.52, SD = 0.50; t(243) = -2.93; p = 0.004, two-tailed). English majors had more experience in online English language learning than non-English majors. The magnitude of the differences in the means (MD = -0.19, 95% CI: -0.31 to 0.06) is very small (eta squared = 0.03).

Differences in Usage of Mobile Devices for Online Learning

Table 5

Differences in Usage of Mobile Devices for Online Learning

		N	**M**	**SD**	**t**	**Sig. (2 tailed)**	**Mean difference**	**Lower**	**Upper**
Target learners	*Uni. Ss*	243	2.95	0.90	6.20	0.00	0.50	0.34	0.66
	School Ss	374	2.45	1.08					
Place of residence	*Urban*	320	2.80	1.00	3.99	0.00	0.33	0.17	0.50
	Rural	297	2.47	1.06					
Study major	*Non-English*	116	2.96	0.90	1.72	0.86	0.02	-0.21	0.25
	English	127	2.94	0.90					

Data in Table 5 shows that there is a significant difference in scores for university students (M = 2.95; SD = 0.90) and school students (M = 2.45, SD = 1.08; t(617) = 6.20; p = 0.00, two-tailed). University students used mobile devices for learning more than high school students. However, the magnitude of the differences in the means (MD = 0.50, 95% CI: 0.34 to 0.66) is at moderate level (eta squared = 0.06). Similarly, there is a significant difference in scores for urban participants (M = 2.80; SD = 1.0) and rural ones (M = 2.47, SD = 1.06; t(617) = 3.99; p = 0.00, two-tailed). Again, it seems that urban students used mobile devices for learning more than rural ones. The magnitude of the differences in the means (MD = 0.33, 95% CI: 0.17 to 0.50) is also relatively small (eta squared = 0.3). However, there is no significant difference in scores for non-English majors (M = 2.96; SD = 0.90) and English majors (M = 2.94, SD = 0.90; t(243) = 1.72; p = 0.86, two-tailed).

Acceptance of Mobile Devices for Online English Language Learning

To answer the second study question about the acceptance of mobile devices for

English language learning, the correlations among the seven constructs of the UTAUT model were investigated. Table 6 shows the descriptive and bivariate correlations for the constructs.

Correlation

Table 6

Descriptive Statistics and Pearson Correlation Matrix

Constructs	**PE**	**PP**	**EE**	**FC**	**SI**	**ATT**	**BI**	**M***	**SD**	**α**
PE	1							3.87	.51	.80
PP	.306**	1						3.46	.55	.81
EE	.445**	.327**	1					3.87	.46	.79
FC	.262**	.260**	.440**	1				3.9	.47	.81
SI	.380**	.358**	.436**	.313**	1			3.61	.65	.79
ATT	.390**	.376**	.406**	.337**	.460**	1		3.9	.64	.78
BI	.382**	.420**	.465**	.316**	.561**	.568**	1	3.87	.72	.77

*Mean score over 5.0; ** Correlation is significant at the 0.01 level (2-tailed)

The sampled students perceived that using mobile devices (mainly mobile phones) for English language learning was a good idea (M = 3.9, SD = .64), and FC had a role to play (M = 3.9, SD = .47). The participants were also supportive of PE, EE, and BI (same means of 3.87 for three constructs and SD of .51, .46, and .72, respectively). SI and PP constructs were the lowest among the seven constructs, though average means were still relatively high (M = 3.61 and 3.46, SD = .65 and .55, respectively).

The relationships among the model constructs were investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of normality, linearity, and homoscedasticity assumptions. There were statistically positive correlations among all the constructs ($p < 0.01$). The strongest correlation was recorded between ATT and BI ($r = .57$) and the weakest between FC and PF ($r = .26$).

PLS-SEM Analysis

PLS-SEM was then utilized to examine the proposed model in Figure 2 or the effects of all constructs (PE, EE, SI, FC, and PP) on both ATT and BI to use mobile devices for language learning.

Evaluation of the Measurement Model

Table 7

Evaluation for the Formative Measurement Model

Formative Construct	Formative Indicator	Outer weights		Outer loadings		95% CI (Outer weights)		VIF
		Outer weight	p-value	Outer loading	p-value	LCL	UCL	
Effort Expectancy	EE1	0.186	**0.045**	**0.621**	**0.000**	0.006	0.365	**1.520**
	EE2	0.268	**0.002**	**0.645**	**0.000**	0.098	0.436	**1.429**
	EE3	0.137	**0.074**	**0.535**	**0.000**	-0.020	0.281	**1.329**
	EE4	0.209	**0.017**	**0.638**	**0.000**	0.036	0.379	**1.417**
	EE5	0.273	**0.001**	**0.593**	**0.000**	0.105	0.440	**1.341**
	EE6	0.337	**0.000**	**0.728**	**0.000**	0.187	0.471	**1.361**
	EE7	0.165	**0.058**	**0.600**	**0.000**	-0.015	0.331	**1.446**
Facilitating Conditions	FC1	0.114	**0.354**	**0.472**	**0.000**	-0.126	0.360	**1.171**
	FC3	0.360	**0.004**	**0.771**	**0.000**	0.094	0.584	**1.562**
	FC4	0.058	**0.655**	**0.638**	**0.000**	-0.206	0.310	**1.575**
	FC5	0.144	**0.261**	**0.571**	**0.000**	-0.098	0.403	**1.319**
	FC6	0.384	**0.005**	**0.693**	**0.000**	0.097	0.624	**1.360**
	FC7	0.400	**0.000**	**0.707**	**0.000**	0.168	0.611	**1.307**
Performance Expectancy	PE1	0.420	**0.000**	**0.792**	**0.000**	0.213	0.609	**1.499**
	PE2	0.084	**0.416**	**0.628**	**0.000**	-0.128	0.279	**1.600**
	PE3	0.186	**0.044**	**0.638**	**0.000**	-0.006	0.363	**1.389**
	PE4	0.160	**0.112**	**0.707**	**0.000**	-0.042	0.354	**1.751**
	PE5	0.462	**0.000**	**0.828**	**0.000**	0.276	0.637	**1.512**
Playfulness	PP1	0.146	**0.075**	**0.348**	**0.000**	-0.017	0.304	**1.275**
	PP2	-0.042	**0.557**	**0.220**	**0.006**	-0.188	0.099	**1.257**
	PP3	0.375	**0.000**	**0.754**	**0.000**	0.193	0.546	**1.413**
	PP4	0.094	**0.285**	**0.683**	**0.000**	-0.082	0.260	**1.693**
	PP5	0.664	**0.000**	**0.921**	**0.000**	0.485	0.818	**1.691**
Social Influence	SI1	0.284	**0.000**	**0.727**	**0.000**	0.128	0.429	**1.873**
	SI2	0.150	**0.068**	**0.725**	**0.000**	-0.011	0.305	**2.032**
	SI3	0.298	**0.001**	**0.770**	**0.000**	0.117	0.473	**1.560**
	SI4	0.523	**0.000**	**0.871**	**0.000**	0.319	0.705	**1.546**

The validity and reliability of the formative measurement model were evaluated against a number of criteria, including potential collinearity and indicators' statistical significance and relevance (Hair et al., 2019). As presented in Table 7, all VIF values were smaller than 5, showing no critical levels of collinearity.

All formative indicators (except FC1, FC2, PP1, and PP2) were proved to be statistically significant at a 5% level of significance, indicating that they statistically contributed to forming their corresponding constructs, although the contributions may not be substantial (small outer weights). Meanwhile, the outer weights of FC1, FC2, PP1, and PP2 were evidenced to be insignificant, with outer loadings below 0.5 but significant at a 1% level of significance. FC2 was removed due to its potential content overlap with FC7, but all three other indicators in the formative model were retained despite their insignificant outer weights. These indicators should be treated as absolutely important instead of significantly important. All in all, the absence of collinearity problems and the statistical significance of indicators suggest that this is a well-fitting formative model.

Table 8

Evaluation for the Reflective Measurement Model

Reflective Construct	Indicator	Convergent Validity			Internal Consistency Reliability	
		Outer Loading	Indicator Reliability	AVE	Composite Reliability	Cronbach's Alpha
Attitude Towards Behavior	ATT1	**0.713**	**0.509**	**0.573**	**0.800**	**0.798**
	ATT2	**0.837**	**0.701**			
	ATT3	**0.714**	**0.510**			
Behavioral Intention	BI1	**0.916**	**0.840**	**0.769**	**0.909**	**0.909**
	BI2	**0.861**	**0.741**			
	BI3	**0.852**	**0.725**			

The reflective constructs were assessed in terms of convergent validity, internal consistency reliability, and discriminant validity, as presented in Table 8. In the original model, the reflective indicators, namely ATT4 and ATT5, were excluded from the final model due to too low outer loading (ATT5) or positive impact on AVE and composite reliability once deleted (ATT4). After the removal of ATT4 and ATT5, all outer loadings were above 0.708, indicating an adequate level of indicator reliability. The values of average variance extracted (AVE) were above the threshold of 0.5; therefore, convergent validity was established. Both composite reliability and Cronbach's alpha values for ATT were within satisfactory range (Nunally & Bernstein, 1994), while those for BI slightly exceeded the desirable level yet were below 0.95. Thus, internal consistency reliability was reached. Finally, the value of the Heterotrait-Monotrait ratio (HTMT) of 0.784 shows that discriminant validity was satisfied. These figures prove that the indicators are reliable and representative measures of the corresponding reflective construct the factor represents.

Evaluation of the Structural Model

Table 9

Evaluation for the Structural Model

Path Coefficients/Direct Effects	Path Coefficient	95% CI LCL	95% CI UCL	Significance
Attitude Towards Behavior -> Behavioral Intention	0.629	0.469	0.806	**0.000**
Effort Expectancy -> Attitude Towards Behavior	0.229	0.131	0.324	**0.000**
Effort Expectancy -> Behavioral Intention	0.020	-0.083	0.113	**0.697**
Facilitating Conditions -> Attitude Towards Behavior	0.132	0.038	0.216	**0.004**
Facilitating Conditions -> Behavioral Intention	-0.007	-0.098	0.071	**0.875**
Performance Expectancy -> Attitude Towards Behavior	0.152	0.057	0.234	**0.001**
Performance Expectancy -> Behavioral Intention	-0.007	-0.091	0.073	**0.865**
Playfulness -> Attitude Towards Behavior	0.246	0.166	0.329	**0.000**
Playfulness -> Behavioral Intention	0.082	-0.007	0.171	**0.066**
Social Influence -> Attitude Towards Behavior	0.306	0.209	0.407	**0.000**
Social Influence -> Behavioral Intention	0.169	0.047	0.285	**0.005**

Total Effects	Total Effects	95% CI LCL	95% CI UCL	Significance
Attitude Towards Behavior -> Behavioral Intention	0.629	0.469	0.806	**0.000**
Effort Expectancy -> Attitude Towards Behavior	0.229	0.131	0.324	**0.000**
Effort Expectancy -> Behavioral Intention	0.163	0.060	0.260	**0.001**
Facilitating Conditions -> Attitude Towards Behavior	0.132	0.038	0.216	**0.004**
Facilitating Conditions -> Behavioral Intention	0.076	-0.025	0.159	**0.108**
Performance Expectancy -> Attitude Towards Behavior	0.152	0.057	0.234	**0.001**
Performance Expectancy -> Behavioral Intention	0.088	0.000	0.173	**0.043**
Playfulness -> Attitude Towards Behavior	0.246	0.166	0.329	**0.000**
Playfulness -> Behavioral Intention	0.237	0.155	0.322	**0.000**
Social Influence -> Attitude Towards Behavior	0.306	0.209	0.407	**0.000**
Social Influence -> Behavioral Intention	0.361	0.266	0.460	**0.000**

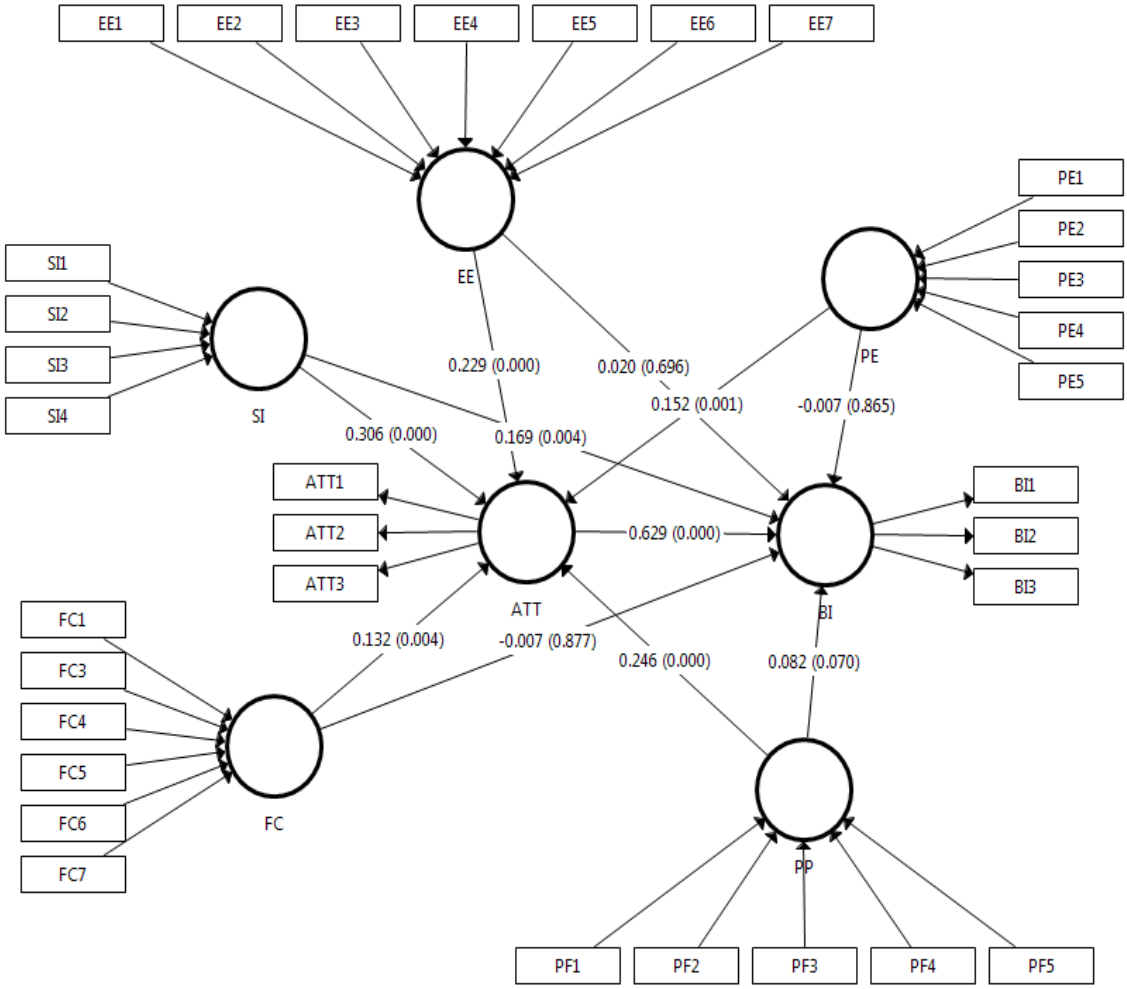
	Specific Indirect Effects	Significance
Effort Expectancy -> Attitude Towards Behavior -> Behavioral Intention	0.144	**0.000**
Facilitating Conditions -> Attitude Towards Behavior -> Behavioral Intention	0.083	**0.006**
Performance Expectancy -> Attitude towards Behaviour -> Behavioral Intention	0.095	**0.002**
Playfulness -> Attitude Towards Behavior -> Behavioral Intention	0.154	**0.000**
Social Influence -> Attitude Towards Behavior -> Behavioral Intention	0.192	**0.000**

Data in Table 9 shows that the collinearity problem was of no concern as all VIF values in the structural model were below the threshold of 5. This suggests factors are neither highly correlated nor redundant and that the structural path coefficients can be reliably used to evaluate the relative importance of predictor variables.

As is revealed, all the original constructs (PE, EE, SI, FC, and PP) were confirmed to be positively related to ATT at a 5% significance level, with coefficients from PP and SI to ATT being the largest (0.246 and 0.306, respectively). Similarly, PP and SI were proved to be significant explanators of BI. Meanwhile, path coefficients from EE, FC, and PE to BI were statistically insignificant (p-values are much bigger than 5%), thereby indicating a little direct contribution of these indicators in explaining BI. However, all indirect paths from EE, FC, and PE to BI were significant, with overwhelming evidence (p-values of less than 1%). This implies that the contribution of these constructs to BI was mostly indirect, through ATT as a mediating role. ATT and BI were also significantly

positively related, with the biggest coefficient of all (0.629). Figure 3 presents the structural model of the analysis.

Figure 3
The Structural Model



The coefficient of determination is one of three measures of the in-sample predictive power of the proposed structural model. Table 10 shows a moderate R^2 level, with the coefficients being 0.605 for ATT and BI (0.637). This indicates that the model explains 60.5% variation in ATT and 63.7% variation in BI. The effect size measured by f^2 is another indicator of in-sample predictive power, which measures the effect of dropping a factor from the model.

Table 10
Coefficient of Determination

	R Square Adjusted	Consideration
Attitude Towards Behavior	0.605	Moderate
Behavioral Intention	0.637	Moderate

The effect size measured by f^2 is another indicator of in-sample predictive power, which measures the effect of dropping a factor from the model. Changes in R^2 are examined when an exogenous construct is deleted from the model to measure its influence on endogenous constructs. ATT to BI reported the largest effect (0.431), while FC and PE to BI obtained the smallest possible value of f^2 of 0.00. Other paths were with small to medium effect sizes. This result is mostly on par with previous conclusions on the insignificant/significant paths presented above. More details can be found in Table 11.

Table 11
Effect Size

	f Square	Effect size
Attitude Towards Behavior -> Behavioral Intention	0.431	Large
Effort Expectancy -> Attitude Towards Behavior	0.076	Small
Effort Expectancy -> Behavioral Intention	0.001	None
Facilitating Conditions -> Attitude Towards Behaviour	0.034	Large
Facilitating Conditions -> Behavioral Intention	0.000	None
Performance Expectancy -> Attitude Towards Behavior	0.040	Small
Performance Expectancy -> Behavioral Intention	0.000	None
Playfulness -> Attitude Towards Behavior	0.113	Medium
Playfulness -> Behavioral Intention	0.012	None
Social Influence -> Attitude Towards Behavior	0.164	Medium
Social Influence -> Behavioral Intention	0.047	Small

The third in-sample predictive measure of the model is Stone-Geisser's Q^2, which is the outcome of the blindfolding procedure. It was found that both ATT and BI had large predictive relevance (0.33 and 0.434, respectively), so predictive relevance for this model was established. See Table 12 for more details.

Table 12
Q^2 Values

	Q^2	Predictive Relevance
Attitude Towards Behavior	0.330	Large
Behavioral Intention	0.434	Large

The PLSPredict provides an out-of-sample prediction measure for the proposed model. As all Q^2_predict values were above zero, other prediction statistics were examined (Hair et al., 2020). As only one dependent construct indicator had prediction errors (measured by root mean squared error (RMSE) and mean absolute error (MAE) higher than the naive LM benchmark, the model had medium predictive power. All in all, the examination of the coefficient of determination, the effect size f^2, and Stone-Geisser's Q^2 and Q^2_predict values reveal that the model has moderate predictive validity.

Multigroup Analysis

Four multigroup analyses were conducted in this study: male versus female, urban versus rural, English versus non-English majors, and experienced versus inexperienced students. Details can be found in Table 13.

Table 13

Multiple Group Analysis of Path Coefficients and Total Effects

Path Coefficients/Direct Effects	PLS-MGA Significance (0.05)			
	Male vs Female	Urban vs Rural	English Major vs Non-English Major	No Experience vs Experience
Attitude Towards Behavior -> Behavioral Intention	No	No	No	No
Effort Expectancy -> Attitude Towards Behavior	No	No	No	No
Effort Expectancy -> Behavioral Intention	No	No	No	No
Facilitating Conditions -> Attitude Towards Behavior	No	No	No	No
Facilitating Conditions -> Behavioral Intention	No	No	No	No
Performance Expectancy -> Attitude Towards Behavior	No	No	No	No
Performance Expectancy -> Behavioral Intention	No	No	No	No
Playfulness -> Attitude Towards Behavior	No	No	No	No
Playfulness -> Behavioral Intention	No	No	No	No
Social Influence -> Attitude Towards Behavior	Yes	No	No	No
Social Influence -> Behavioral Intention	Yes	No	No	No

Total Effects	PLS-MGA Significance (0.05)			
	Male vs Female	Urban vs Rural	English Major vs Non-English Major	No Experience vs Experience
Attitude Towards Behavior -> Behavioral Intention	No	No	No	No
Effort Expectancy -> Attitude Towards Behavior	No	No	No	No
Effort Expectancy -> Behavioral Intention	No	No	No	No
Facilitating Conditions -> Attitude Towards Behavior	No	No	No	No
Facilitating Conditions -> Behavioral Intention	No	No	No	No
Performance Expectancy -> Attitude Towards Behavior	No	No	No	No
Performance Expectancy -> Behavioral Intention	No	No	No	No
Playfulness -> Attitude Towards Behavior	No	No	No	No
Playfulness -> Behavioral Intention	No	No	Yes	No
Social Influence -> Attitude Towards Behavior	Yes	No	No	No
Social Influence -> Behavioral Intention	No	No	No	No

	PLS-MGA Significance (0.05)			
	Male vs Female	Urban vs Rural	English Major vs Non-English Major	No Experience vs Experience
Effort Expectancy -> Attitude Towards Behavior -> Behavioral Intention	No	No	No	No
Facilitating Conditions -> Attitude Towards Behavior -> Behavioral Intention	No	No	No	No
Performance Expectancy -> Attitude towards Behaviour -> Behavioral Intention	No	No	No	No
Playfulness -> Attitude Towards Behavior -> Behavioral Intention	No	No	No	No
Social Influence -> Attitude Towards Behavior -> Behavioral Intention	No	No	No	No

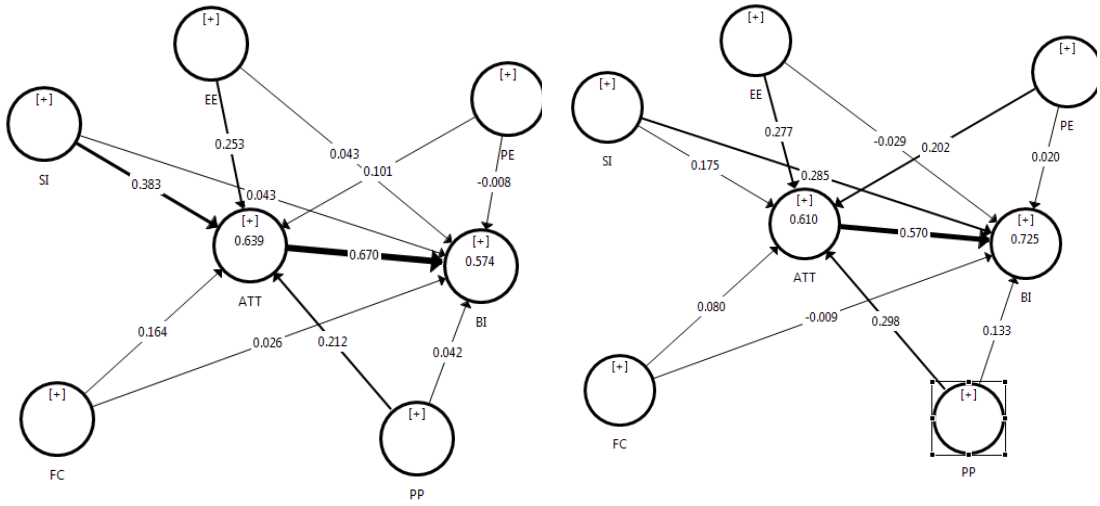
The multiple-group analysis indicates no significant differences between urban and rural groups and between experienced and inexperienced groups. However, it indicates that female and male students were significantly different in terms of direct and total effects for the path from SI to ATT and total effects from SI to BI at a 5% significance level. Besides, English majors were significantly different from non-English majors concerning total effects on the path from playfulness to BI.

Table 14
Multiple Group Analysis for Significant Paths

Social Influence -> Attitude Towards Behavior	**Female**	**Male**
Path Coefficients/Direct Effects	0.383	0.175
Total Effects	0.383	0.175
Social Influence -> Behavioral Intention	**Female**	**Male**
Total Effects	0.043	0.285
Playfulness -> Behavioral Intention	**English Major**	**Non-English Major**
Total Effects	0.046	0.489

Table 14 shows that male students had a lower direct/total effect in their perception of the effects SI had on ATT but a higher total effect than female students in the influence of SI on BI, both at a 5% significance level. Meanwhile, the extent to which non-English majors perceived the total effect of PP on BI was more significant than English majors. The relative contribution of each construct to ATT and BI for the males and females is visualized in Figure 4.

Figure 4
The Structural Model of Female and Male Groups



Female Group *Male Group*

Discussion

The current study was guided by UTAUT conceptual framework to explore the usage and verify the acceptance of mobile devices for English language learning by Vietnamese teenagers. In what follows, the results of this study will be compared to the findings of previous work.

Regarding usage, Vietnamese teenagers tended to use mobile devices mostly for social networking and information search. Online learning was the lowest-ranked purpose, behind other personal usages like taking photos and email. Multiple-group analysis

reveals significant differences in the way females and males perceive factors that affect their ATT and BI. Specifically, female students generally perceived SI to be more influential to ATT and BI than their male counterparts. The results of this study contradict the previous research by Al-Adwan et al. (2018), which indicated that gender had no moderating effects on relationships among the structural components of the UTAUT model. The insignificant differences between males and females in most of the other structural relationships in this study (see Table 13) seem to be consistent with the results of research by Maheshwari (2021), which found the impact of gender on only one (intrinsic factor) out of 6 variables. Similarly, Hilao and Wichadee (2017) found no difference between males and females in their attitudes toward using mobile devices for learning.

The findings of this study reveal that English majors put a higher emphasis on the influence of playfulness on intention than non-English majors. This issue has not much been investigated in earlier studies on MELL. The results of a study by Mekhzoumi et al. (2018) revealed significant differences between English and non-English majors in the influence of PE, FC, and self-management of learning on BI, which were not evident in this study. However, the insignificant influence of EE and SI on BI in the current study corroborates the findings of a study by Mekhzoumi et al. (2018). Playfulness was not included in their study. Hence, further empirical evidence is needed to verify if there are significant differences between English and non-English majors in their perceptions of the influences of different variables on intention to adopt MELL.

The multiple-group analysis indicates that there were no significant differences between urban and rural groups in their intention for mobile learning. There are few studies globally on this aspect; however, the above findings are in agreement with Trung's (2020) study, which pointed out that rural and urban learners in Vietnam possessed similar digital skills. This was possible thanks to the efforts of the country's Ministry of Education and Training in teaching computer and Internet skills to its students of all levels nationwide. However, studies in other countries showed that there were differences between people living in rural and urban areas, and between those living in developed and developing countries, regarding their access to the Internet and digital skills (Kaliisa et al., 2017; Lembani et al., 2020).

Regarding the second question of the study, i.e., validating the ATAUT model to measure teenagers' acceptance of MELL, the current study found statistical support for construct interrelationships, represented by significant path coefficients and total effects in the model. Overall, the value of R2 for BI was 63.7%, indicating a moderate predictive accuracy level. More specifically, the total effects of all paths to ATT were positive, at a 5% significance level, implying that all relationships in the proposed model explained students' attitudes. Notably, the model proposed by Venkatesh et al. (2003) explained 56.5% of the variance for ATT, while extending their model with playfulness helped to raise the explained variance to 60.5%, which demonstrated the need for incorporating playfulness to increase the explanatory power of the model. Additionally, the value of Q2 for this endogenous construct was 0.434, which showed a large predictive relevance of the partial least squares model. Both indicators signaled satisfactory explanatory power of the proposed model. Undoubtedly, ATT strongly influenced BI, which corresponds with Gan et al. (2017) and Thomas et al. (2013).

The direct effects of some key constructs on BI (i.e., EE, PE, and FC) were statistically insignificant and even negative (PE and FC). This outcome seems to be in

contradiction with findings by most previous studies (Barrett et al., 2021; Botero et al., 2018; Doan, 2018; Hoi & Mu, 2020; Mekhzoumi et al., 2018), which found PE and EE to be direct determinants of BI. This outcome also contradicts the studies by Hamidi and Chavoshi (2018) and Hu et al. (2019), in which FC was shown to be highly associated with BI. However, specific indirect effects of such constructs were overwhelmingly significant (at a 1% significance level), implying that most of the influence of these factors on BI was meditated by ATT. As a result, the total effects of these factors became positive and significant (except for FC). The insignificant path between EE and BI in this study, nonetheless, confirms the results of Doan's (2018) findings which suggested that "as smartphones have become increasingly popular in Vietnamese universities, performing mobile tasks appears to be no longer a matter of concern to today's students" (p.57).

Playfulness is considered one of the intrinsic factors that directly impact perceived usefulness and intention to undertake mobile learning (Maheshwari, 2021; Padilla-Meléndez et al., 2013). The PLS results of this study imply that playfulness could affect learners' intentions. These results are in line with past research on the role of enjoyment and playfulness in online and mobile learning (Huda & Zainuddin, 2015; Maheshwari, 2021; Padilla-Meléndez et al., 2013; Taharim et al., 2016). Similarly, attracting learners' interest was one of the key attitudes (being playful) toward mobile learning in Tran's (2020) research. This still needs further investigation because there was a difference in recognizing the role of playfulness between language and non-language majors in their BI for online learning, as shown in the findings presented in the above section of this study.

The PLS findings indicate that social influence could affect learners' BI. The effects of social influence on ATT were quite noticeable (0.306), which indicated that social influence was a major and relevant factor that determined how learners perceived mobile-assisted language learning, affecting their intention to study. However, the direct impact of social influence on BI was relatively small (0.17), suggesting that there were areas that needed improvement to change mobile language learners' intentions. It may be assumed that social influence might have been integrated into extrinsic factors and teacher support and was therefore difficult to find. However, due to little usage of mobile devices for online learning (see Table 3), some attention should be paid to enhancing the extrinsic factors and teacher support. These extrinsic factors and supports significantly influenced PE, PEOU, and then BI, as revealed in studies on MELL in Vietnam (Hoi & Mu, 2021; Maheshwari, 2021).

Limitations and Future Studies

The findings in this report are subject to a number of limitations. First, quantitative data were collected via a self-reporting survey, and some were gathered online due to Covid-19, which could have been subject to biases and threats to research validity. Second, the current study collected data at only one point in time, which could be remediated in the future by longitudinal studies to investigate key determinants that may influence learners' intention to use mobile devices for English language learning. Hence, future studies should include data on learners' actual usage of a mobile English language learning application and software, together with a survey before and after the usage to get

a fuller picture of their reported opinions and actual behavior in a mobile learning context. Third, as the sample was collected only in Vietnam, the transferability of the findings in other non-English speaking countries is limited. Thus, future studies should be expanded to other countries with similar contexts to Vietnam's. Finally, the study did not take into account the role of teachers or moderators in encouraging mobile learning, which is very important in the Vietnamese context (Tran, 2020). Future studies should include additional latent variables related to teacher support that helps to arouse learners' interest and deep engagement in mobile learning.

Conclusion and Implications

The present study was designed to explore the usage and verify the acceptance of mobile devices for English language learning by Vietnamese teenagers. This study found that Vietnamese teenagers tended to use mobile devices more for non-academic purposes like browsing social networks and searching for information than learning online. There were statistical differences between rural and urban, university and school, and English and non-English majors in their current usage of mobile devices for online learning in general and English language learning in particular. Female and male students differed in their perceptions about the role of social influences on their attitudes and intention to use mobile devices for learning. However, the differences were minimal in magnitude. This implies that further studies are needed to explore the differences and ways to motivate different groups of students regarding the adoption of mobile learning.

The second significant finding of this study is that attitudes towards the use of construct strongly influenced BI to use mobile devices for English language learning. Most of the ATAUT's key constructs directly affected learners' attitudes and indirectly impacted their intention to undertake mobile learning. The evidence from this study confirms Tran's (2020) findings of attitudes towards behavior in influencing Vietnamese learners' actual behavioral intention to use mobile devices for language learning. For example, if Vietnamese educators and software designers want to persuade learners to use mobile devices for language learning, they should first focus on proving their usefulness. The current study also confirms the roles of social influence (e.g., encouragement from teachers) and learning enjoyment on learners' intention. Taken together, these findings support strong recommendations to take drastic measures to improve Vietnamese students' attitudes towards mobile English language learning.

With the youth's increasing ownership of mobile devices and increasing research on their usage purposes (very little for learning), it is necessary to conduct more studies on effective ways to foster learners' mobile English language learning in a developing country like Vietnam. This study contributes to the current knowledge about factors that drive young learners' intentions to learn English through mobile devices. The results of this study also indicated that playfulness had an effect on promoting learners' attitudes towards their intention to adopt mobile English language learning in the Vietnamese context. This implies that mobile application designers and content developers should integrate more fun elements into mobile applications to arouse learners' motivation to practice language skills while on the move.

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Appendix 1: Survey questionnaire

Dear participants

A group of researchers from Hanoi University is developing a software for mobile English language learning for Vietnamese teenagers. We would like you to spare about 10 minutes to fill in this anonymous questionnaire. Information in the survey will be kept confidential and used for this research only. Thank you very much.

On behalf of the research group
Pham Ngoc Thach

Part 1. Demographic information

1. Gender: MALE ☐ FEMALE ☐
2. Date of birth: ……. Current place of residence ……
3. Year of study: …… Major ……..
4. Have you ever taken part in any online learning course? Yes ☐ No ☐
5. Which mobile devices do you often use? smartphone ☐ Tablet ☐
6. Which do you use more for Internet connection? Wifi ☐ 3G/4G/5G ☐
7. What are your purposes of using mobile devices, and at what frequency?

Purpose	**Frequency**				
	Never	**Rarely**	**Sometimes**	**Always**	**Usually**
1. Online learning (taking part in a course)	1	2	3	4	5
2. Entertainment (game, music, video...)	1	2	3	4	5
3. Updating information (newspaper, television)	1	2	3	4	5
4. Online shopping	1	2	3	4	5
5. Using email	1	2	3	4	5
6. Social network	1	2	3	4	5
7. Information search	1	2	3	4	5
8. Taking photo, video	1	2	3	4	5

Other purposes (indicate frequency)……..

Part 2. Please circle 1 to 5 to your opinions about using mobile devices for English language learning.

	Strongly disagree (1)	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly agree (5)**
I. Performance expectancy					
1. The usage of mobile devices (MD) could enable learning English (EN) more quickly.	1	2	3	4	5
2. The usage of MD could improve EN skills.	1	2	3	4	5
3. The usage of MD could improve EN performance.	1	2	3	4	5
4. The usage of mobile applications could improve EN performance.	1	2	3	4	5

5. In general, I find MD effective for EN learning.	1	2	3	4	5
II. Perceived Playfulness					
6. When using m-learning, I do not realise the time elapsed.	1	2	3	4	5
7. When using m-learning, I forget the work I must do.	1	2	3	4	5
8. Using m-learning gives enjoyment to me for my learning.	1	2	3	4	5
9. Using m-learning stimulates my curiosity.	1	2	3	4	5
10. Using m-learning leads to my exploration.	1	2	3	4	5
III. Effort expectancy					
11. I find it easy to use MD for EN learning	1	2	3	4	5
12. I find it easy to use MD to learn listening	1	2	3	4	5
13. I find it easy to use MD to learn speaking	1	2	3	4	5
14. I find it easy to use MD to learn reading	1	2	3	4	5
15. I find it easy to use MD to learn writing	1	2	3	4	5
16. I can easily find and use mobile apps for EN learning.	1	2	3	4	5
17. I can easily learn to use MD for EN learning.	1	2	3	4	5
IV. Facilitating conditions					
18. I have easy access to an MD	1	2	3	4	5
19. I can have easy access to the Internet (via wifi or data plan).	1	2	3	4	5
20. I can find apps for EN learning in MD.	1	2	3	4	5
21. I have the knowledge necessary to use MD for EN learning.	1	2	3	4	5
22. I can find support if I experience problems with using MD for EN learning	1	2	3	4	5
23. I know a convenient place to use MD for EN learning.	1	2	3	4	5
24. I regularly access the Internet via MD (via wifi or data plan).	1	2	3	4	5
V. Social influence					
25. People who influence my behavior think that I should use an MD to learn EN	1	2	3	4	5
26. People who are important to me think that I should use an MD to learn EN	1	2	3	4	5
27. University teachers are supportive of using an MD to learn EN	1	2	3	4	5
28. University students are supportive of using an MD to learn EN.	1	2	3	4	5
VI. Attitudes towards use					
29. The usage of MD to learn EN is a good idea.	1	2	3	4	5
30. I would like to use MD to learn EN	1	2	3	4	5
31. I think learning EN with MD is fun.	1	2	3	4	5
32. I think using MD to learn EN inside the classroom is a good idea.	1	2	3	4	5
33. I think using MD to learn EN outside the classroom is a good idea.	1	2	3	4	5
VII. Behavioral intention					

34. I intend to use an MD to learn EN in the near future.	1	2	3	4	5
35. I will use an MD to learn EN in the near future.	1	2	3	4	5
36. I have a plan to use an MD to learn EN in the near future.	1	2	3	4	5