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A Look at Technology Use for English Language Learning from a Structural Equation Modeling Perspective

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Abstract

Mobile-Assisted Language Learning (MALL) has become an essential approach in the field of language education, especially for English as a foreign language (EFL) teaching. This study enhanced the unified theory of acceptance and use of technology (UTAUT) to examine the determinants that influence the acceptance of mobile technology use for English language learning. A quantitative method was applied in this study, which involved 342 pre-service teachers in an English department at a state university in Indonesia. The instrument used in collecting the data was a questionnaire. The collected data were analyzed using Structural Equation Modeling – Partial Least Square (SEM-PLS) with the SmartPLS3 program to analyze the proposed hypotheses of the study objectives. The SEM results supported the entire main constructs of UTAUT proposed in the hypotheses. Findings suggest that determinants of mobile technology acceptance are the major factors influencing the usage of mobile technology. The study concluded that the usage behavior of mobile technology had been influenced by four main variables of UTAUT, namely performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). Besides, the effect of behavioral intention (BI) uses on usage behavior (UB) of mobile technology had not been moderated by gender.

Keywords: English Language Learning, MALL, Mobile Technology, SEM-PLS, UTAUT

Introduction

Since the emergence of mobile technologies, the use of mobile devices and services have continued to increase progressively at different rates in the field of education. Mobile technologies provide mobile access to voice, video, data, image, and communications. However, mobile technologies are useful for more than only communication. For instance, Smartphone users may stay connected by using installed applications or the Internet, allowing them to "be mobile" in their job, education, and leisure. In addition to time-saving applications, mobile technologies provide access for anyone to anything at anytime and anywhere. Mobile technologies enable connectivity with others, facilitate human development, and provide sources of information and services (UNDP, 2012). Furthermore, Mobile technology apps are widely promoted as important tools for language learning (Ardıç & Çiftçi, 2019; Namaziandost et al., 2021; UNESCO, 2018).

As one of the widely-known mobile technology approaches to learning, Mobile-Assisted Language Learning (MALL) appeared around 2005, and in the last 16 years, mobile devices such as laptops, smartphones, gadgets, and tablets have become a reality with a significant presence in many fields, including language learning (Tran, 2020). The use of mobile technologies can affect students' attitudes and enhance self-directed learning (Azevedo et al., 2017). Therefore, research on Mobile-Assisted Language Learning (MALL) may be one of the most challenging research topics in educational contexts nowadays.

In the context of English as a foreign language (EFL) learning, MALL can support learning and teaching in various ways. It could alter students' roles from passive to active through a range of activities (Al-Rahmi et al., 2019; Bilgiç & Ataman, 2020; Briz-Ponce et al., 2017; Tran, 2020). With the expeditious development of information and communication technology (ICT), mobile technologies have become a significant role in MALL. Mobile technologies allow student-centered learning, in which learners can experience an authentic learning environment (Namaziandost et al., 2021), complete a variety of activities, and enjoy a more interesting learning process (Mei et al., 2018; Zhang & Pérez-Paredes, 2019). Flexibility, user-friendliness, small equipment size, and low cost, are among the advantages of mobile technologies mentioned that MALL enables learners to experience real-world feelings and emotions by interacting with learning material and the real environment, enhancing their learning interest and motivation (Botero et al., 2019; Coşanay & Karalı, 2022; Wang & Hsu, 2020).

Most research on the adoption and continued use of technology are based on the Technology Acceptance Model (TAM) (Davis, 1989). The Unified Theory of Acceptance and Use of Technology (UTAUT) is based on and extends TAM in an attempt to unify

the eight most often used constructs in technology acceptance study into a single and simple model (Venkatesh et al., 2003). As a result, the UTAUT serves as the basis for the current study on Mobile Assisted Language Learning uptake.

Previous studies confirm that integrating technology in English learning is effective in improving students' attitudes (Idowu & Gbadebo, 2017; Sabti & Chaichan, 2014; Wang & Hsu, 2020), motivation (Lamb & Arisandy, 2020), independent learning (Jose & Abidin, 2015; Shevchenko, 2018), and English language skills (Balbay & Kilis, 2017; Howlett & Zainee, 2019; Taj et al., 2017). The current study differs from prior studies in that it investigates the acceptance and integration of MALL among EFL university students in Indonesia as having a unique culture that is different from the other country's culture. The fundamental contribution of this study is to exploit UTAUT to predict technology acceptance of MALL in Indonesia as a developing country, in addition to inquiring about some relevant post-implementation treatments that might contribute to the adoption and integration of MALL for English learning. It is intended that this study will provide a roadmap to a better understanding of the success factors and post-implementation interventions contributing to the acceptance and assimilation of MALL in English language teaching and learning. The specific objectives of this study are to 1) examine a customized Technology Acceptance Model using UTAUT model for the determinants of the acceptance and assimilation of MALL; 2) measure the customized students' acceptance and assimilation of MALL; and 3) explore the antecedents of MALL acceptance for better English language teaching and learning.

Literature Review

Mobile-Assisted Language Learning

Parallel to the rising use of mobile devices such as smartphones, tablets, and gadgets, a new modified approach known as Mobile-Assisted Language Learning (MALL) was developed to better depict the sophisticated use of technology in language learning. MALL is defined as a form of delivering language learning to students anytime and anywhere through the use of the Internet and mobile devices, including mobile phones, smartphones, and gadgets (Hwang, 2014; Wang & Hsu, 2020). Through the application of MALL, students can interact with learning resources, including authentic materials anytime and anywhere without being bound by space and time like normal learning in a classroom. However, the majority of students still use their mobile devices only for entertainment and communication (Al Arif, 2019; Hamid et al., 2020; Tri & Nguyen, 2014).

MALL plays a significant role in English language learning to improve the effectiveness of English instruction, and also the usage of mobile devices can boost student motivation. The use of mobile devices can help students improve their English

skills (Balbay & Kilis, 2017; Howlett & Zainee, 2019). In addition, the integration of MALL can motivate students to learn English (Grandon, 2014; Kreutz & Rhodin, 2016). The integration of MALL can provide opportunities for students to interact and collaborate in the learning process, and also, students can take opportunities and benefits from what MALL provides (Murray, 2005; Ziegler, 2016). In the context of learning English, MALL provides opportunities for students to interact directly with native speakers through applications on mobile devices such as e-mail, social media, and video-based communication (Thamarana, 2015).

Studies on Mobile Technologies in Language Learning

Advances in Internet technologies and related applications enable students to interact with teachers and materials in new ways. Previously, Kreutz and Rhodin (2016) investigated if incorporating ICT in the EFL classroom can increase students' motivation. The result of this study showed that most students have a positive attitude towards ICT. Also, their study showed that students' motivation increased as the lessons became more enjoyable, and they were happier when ICT was integrated into the EFL curriculum.

A myriad number of previous studies have been conducted to examine the factors that may impact students' acceptance of using mobile technology for learning. First, Rahim and Chandran (2021) examined the perceptions of EFL students on implementing M-learning at university-level education in the EFL context of Afghanistan. The results showed that EFL students have a positive perception of e-learning as a better alternative to traditional classrooms. Despite being regarded as an interactive method for EFL education, the lack of regular electricity connection, low internet bandwidth, high costs of ICT tools, lack of infrastructures, and lack of ICT knowledge of the teachers and students are perceived to be the barriers to implementing e-learning in Afghanistan higher education.

Second, Briz-Ponce et al. (2017) investigated the different factors and drivers that could influence students' behavior in the implementation of M-learning. Their study revealed that behavior patterns based on the experience and application by medical students correlated with a strong attitude towards using mobile technology for learning and willingness to recommend it. In addition, the student's ease of use perception seems to be the main factor affecting the Social Influence. The reliability of recommending this technology for learning was the main factor that affected the Behavioral Intention.

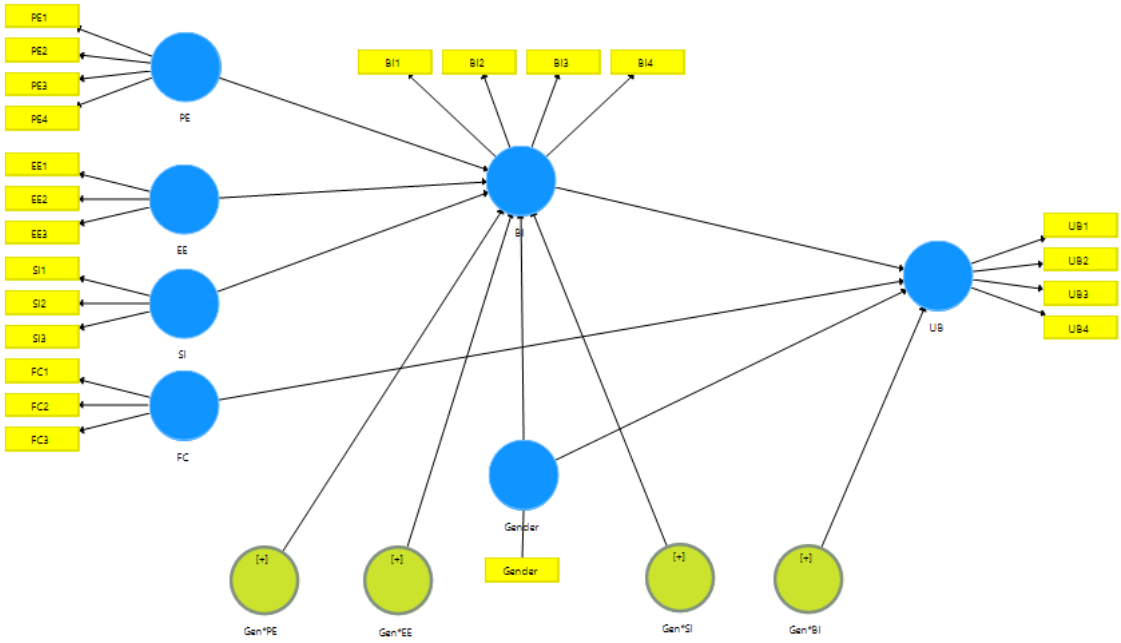
Third, Sabti and Chaichan (2014) examined the attitudes of Saudi Arabian high school students toward the use of computer technologies in learning English. A quantitative approach was applied, which involved 30 Saudi Arabia students of a high school in Kuala Lumpur, Malaysia. The analysis of the study revealed gender differences in attitudes toward the use of computer technologies in learning English. Female students showed higher and more positive attitudes towards computer technologies in learning English than males.

Research Model and Hypotheses

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a valid model to explore users' acceptance of the use of new technology developed by Venkatesh, Morris, and Davis (2003). They theorized that four constructs would play a significant role as direct determinants of user acceptance and usage behavior: performance expectancy, effort expectancy, social influence, and facilitating conditions. They defined each determinant and specified the role of key moderators (gender, age, voluntariness, and experience).

In this current study, we only use gender as a moderator variable and exclude the other three moderator variables (e.g., age, voluntariness, and experience) because the respondents are pre-service teachers who are approximately at the same age, so they are considered to have almost the same experience and volunteerism in the use of mobile technology.

Figure 1
Model of the study



Notes:
PE: Performance Expectancy
EE: Effort Expectancy
SI: Social Influence
FC: Facilitating Condition
BI: Behavioral Intention
UB: Use Behavior
Gen: Gender

Figure 1 above describes the model of this study. Four main constructs (PE, EE, SI, and FC) of the study model were predicted to have a significant effect on usage behavior (UB) that is explained by behavioral intentions (BI). Gender as a moderating variable will be predicted to moderate the influence of behavioral intention (BI) on usage behavior (UB). Because of that, the current study's main hypotheses are as follows:

Table 1
Proposed research hypotheses

H1	**Performance expectancy (PE) will significantly influence behavioral intention (BI) to use mobile technology**
H2	Effort expectancy (EE) will significantly influence behavioral intention (BI) to use mobile technology
H3	Social Influence (SI) will significantly influence behavioral intention (BI) to use mobile technology
H4	Facilitating condition (FC) will significantly influence use behavior (UB) of mobile technology
H5	Behavioral intention (BI) will significantly influence use behavior (UB) of mobile technology
H6	Gender (Gen) will significantly moderate the influence of PE on behavioral intention (BI) to use mobile technology
H7	Gender (Gen) will significantly moderate the influence of EE on behavioral intention (BI) to use mobile technology
H8	Gender (Gen) will significantly moderate the influence of SI on behavioral intention (BI) to use mobile technology
H9	Gender (Gen) will significantly moderate the influence of BI on use behavior (UB) of mobile technology

Method

Participants

This study performed a survey in a state university in Indonesia among pre-service teachers of the English department. Respondents (n = 342) were solicited in this study. Table 2 presents the detailed analysis of participants' demographic information and other data related to their ownership of mobile devices, activities in using mobile devices, and experience.

Table 2
Demographic Information of Respondents

	Number	Percentage
Gender		
Female	265	77.5%
Male	77	22.5%
Class Enrollment		
1st Year Students	86	25.1%
2nd Year Students	85	24.9%
3rd Year Students	87	25.4%
4th Year Students	84	24.6%
Mobile Devices Ownership	342	100%
Experience of Using Mobile Devices		
0-1 Year	59	17.3%
1-2 Years	64	18.7%
>2 Years	219	64%
Using Mobile Devices for English Learning	329	96.2%

It is important to note that about 77.5% of the respondents in the sample are female, and 22.5% are male. This is because there are more female students than males. Approximately 25% of the respondents were enrolled in their first, second, third, and fourth year of English language education, and most part (64%) of the students used mobile devices for more than 2 years. Another important data is that all respondents (100%) owned mobile devices (e.g., smartphones, tablets, or both). In addition, 96.2% of the respondents contended that they use mobile devices for English learning, while the rest did not.

Research Instrument

The questionnaire consisted of 28 questions grouped in two sections. The first section included 7 questions related to demographic and context information such as academic years, gender, and mobile device ownership. The second section included 21 items and was designed based on the UTAUT model published by Venkatesh et al. (2003) and some previous literature, consisting of performance expectancy, effort expectancy, social influence, behavioral intention, and usage behavior on mobile devices for English language learning. The respondents were asked to respond to each statement in terms of their own degree of agreement or disagreement. The Likert scale is based on four possible answers ranging from strongly disagree (1) to strongly agree (4).

The questionnaire's validity was ensured by its design, which was based on prior literature research and expert judgment. The questionnaire's content validity was assessed by two technology-enhanced language learning (TELL) specialists in face-to-face discussions to ensure the relevance and quality of entire items in the questionnaire. The

questionnaire has been modified, including the layout, size, and language translation. Given that the respondents were pre-service teachers (ranging from Year 1 to Year 4) with varying levels of English proficiency, a three-step adaptation approach (forward translation, review, and reverse translation) was used to create a credible Indonesian version of the questionnaire.

The questionnaire was distributed among the targeted 415 pre-service teachers in the English department as respondents. The respondents who responded to the questionnaire were 342, thus achieving a response rate of 82.4%.

Research Procedure

An online version of the survey was created using Google Forms. The link to the survey was delivered to the participants through the online course management system and social networking (e.g., WhatsApp). Data collection was carried out from August to October 2021 in tandem with the beginning of the course process of the academic year of 2021. For data matching purposes, respondents were asked to provide the last three digits of their university identification numbers while submitting their responses. In other words, respondents were not required to provide their identification numbers, which let them respond anonymously.

Data Analysis

In analyzing the data, we coded the data gathered through the online questionnaire. The data was first imported into an MS Excel spreadsheet. The data was then transferred to the SmartPLS3 application, version 3.2.9, which was used to run the measurement model to get descriptive statistics such as mean, standard deviation, frequency, percent, and correlation. We also looked at the factor loading's value of each item in the constructs to make sure that the values > 0.70. The structural model in the SmartPLS3 program was used to test the hypotheses with a significant rate of 0.05. The effects of UTAUT constructs on mobile technology usage behavior for English learning were examined using confirmatory factor analysis and path analysis in partial least squares (PLS-SEM). Before testing the hypothesis, we performed validity and reliability tests to fulfill the requirements of analysis using PLS-SEM.

Results

Descriptive Statistics

In this section, we provide a main descriptive statistic of each construct. Table 3 describes the different values for mean, variance, standard deviation, Kurtosis, and

skewness. All means are larger than the midpoint, within the range from 2.830 to 3.398. It is important to notice that the standard deviations are within the range from 0.486 to 0.684, indicating a narrow spread around the average. Besides, the values of skewness and kurtosis could be used as normality test data. When the absolute value of the data is within ±1, the data is considered normal. The results obtained with this study implied the survey was fairly normally distributed in all constructs. However, the PLS technique minimizes this problem, and besides, the rule of thumb published by Kline (2016) establishes that absolute values of Skewness < 3 and Kurtosis < 10 could be considered as accepted values.

Table 3
Descriptive Statistics

	Mean	Loadings	Standard Deviation	Excess Kurtosis	Skewness
PE1	3.398	0.853	0.562	1.096	-0.534
PE2	3.254	0.784	0.554	1.322	-0.288
PE3	3.254	0.885	0.548	0.808	-0.163
PE4	3.193	0.866	0.570	0.691	-0.204
EE1	3.091	0.870	0.536	1.912	-0.266
EE2	3.249	0.891	0.518	1.183	-0.016
EE3	3.190	0.891	0.537	1.161	-0.106
SI1	2.845	0.796	0.594	1.068	-0.526
SI2	3.032	0.829	0.486	1.928	-0.072
SI3	3.006	0.841	0.490	1.832	-0.136
FC1	3.304	0.814	0.520	0.883	-0.040
FC2	3.158	0.903	0.500	1.956	0.004
FC3	3.135	0.908	0.535	1.350	-0.121
BI1	3.237	0.883	0.577	1.489	-0.435
BI2	3.246	0.904	0.576	1.505	-0.440
BI3	3.292	0.856	0.515	0.982	-0.004
BI4	3.173	0.888	0.589	1.275	-0.405
UB1	3.243	0.814	0.574	0.557	-0.249
UB2	2.845	0.814	0.655	-0.309	-0.016
UB3	2.982	0.847	0.662	0.182	-0.285
UB4	2.830	0.829	0.684	0.092	-0.264

Constructs Validity and Reliability

The outer model performs an exploratory analysis obtaining the scale reliability and the construct validity. For reliability, this study follows the criteria suggested by Fornell and Larcker (1981), Chin (1998), and Hair et al. (2019). First, all indicator factor loadings should be significant and exceed 0.5. Second, the factor loadings should have at least a value of 0.7 and have a t-statistic over ±1.96 at the 5% level. Finally, the composite

reliability should be higher than 0.7. Table 4 provides a detailed view of the main indicators used for the measurement model. It shows that the factor loadings obtained from SmartPLS3 are significant at the 5% level. Besides, all items set the rule thumb of 0.5 for the indicator reliability and 0.7 for standardized factor loadings. According to Hair et al. (2019), the acceptable value of Cronbach's alpha depends on the type of research. It is an exploratory analysis, and the author states 0.7 as the minimum accepted value of Cronbach's alpha.

Table 4
Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BI	0.906	0.906	0.934	0.780
EE	0.861	0.865	0.915	0.782
FC	0.847	0.848	0.908	0.767
Gen*BI	0.881	1.000	0.914	0.726
Gen*EE	0.877	1.000	0.918	0.790
Gen*PE	0.838	1.000	0.838	0.571
Gen*SI	0.724	1.000	0.762	0.559
PE	0.869	0.875	0.911	0.719
SI	0.765	0.774	0.862	0.676
UB	0.847	0.859	0.896	0.683

Composite reliability for all the factors in our measurement model was above 0.762. The average variance extracted (AVE) was all above the recommended 0.50 level (Hair et al., 2019), which means that more than one-half of the variance observed in the items was accounted for by their hypothesized factors. The result of convergent validity was the outer loading score of each construct > 0.7 and the AVE's score > 0.5, which means that the constructs of the instrument in this study were valid. Also, squared multiple correlations between the individual items and their priori factors were high. Thus, all factors in the measurement model had adequate reliability and convergent validity.

Discriminant Validity

Discriminant validity was done by using the Fornell-Larcker criterion. The score of BI was 0.883, EE was 0.884, FC was 0.876, PE was 0.848, SI was 0.822, UB was 0.826. Each construct had a score > 0.7. The discriminant validity is the extent to which the construct does not correlate with other measures that are different from it. According to the validity indicator, the convergent validity is evident, and the survey exhibits a good discriminant validity, so the results suggest the validity of this research.

Table 5
Discriminant Validity - Fornell-Larcker Criterion

	BI	EE	FC	Gender	PE	SI	UB
BI	**0.883**						
EE	0.647	**0.884**					
FC	0.654	0.679	**0.876**				
Gender	-0.068	-0.118	-0.121	**1.000**			
PE	0.740	0.644	0.609	-0.035	**0.848**		
SI	0.433	0.466	0.441	0.038	0.422	**0.822**	
UB	0.697	0.637	0.555	-0.025	0.689	0.520	**0.826**

To examine discriminant validity, this study compared the shared variance between factors with the average variance extracted from the individual factors (Fornell & Larcker, 1981). This analysis showed that the shared variances between factors were lower than the average variance extracted from the individual factors, thus confirming discriminant validity. In summary, the measurement model demonstrated adequate reliability, convergent validity, and discriminant validity.

Structural Model Hypotheses

The inner model "depicts the relationship among latent variables based on the substantive theory" (Chin, 1998). For this model, this study follows the steps recommended by Hair et al. (2019). First, it is necessary to calculate the path coefficients and their significance. Then, the R2 measures the variance for each construct. The third step is to calculate the change of R2, obtaining the f2 statistics, which indicates the strength of each independent item for its corresponding factor, and finally, the indicator of the model's predictive relevance by calculating the parameter Q2.

Figure 2

The path coefficients for all constructs

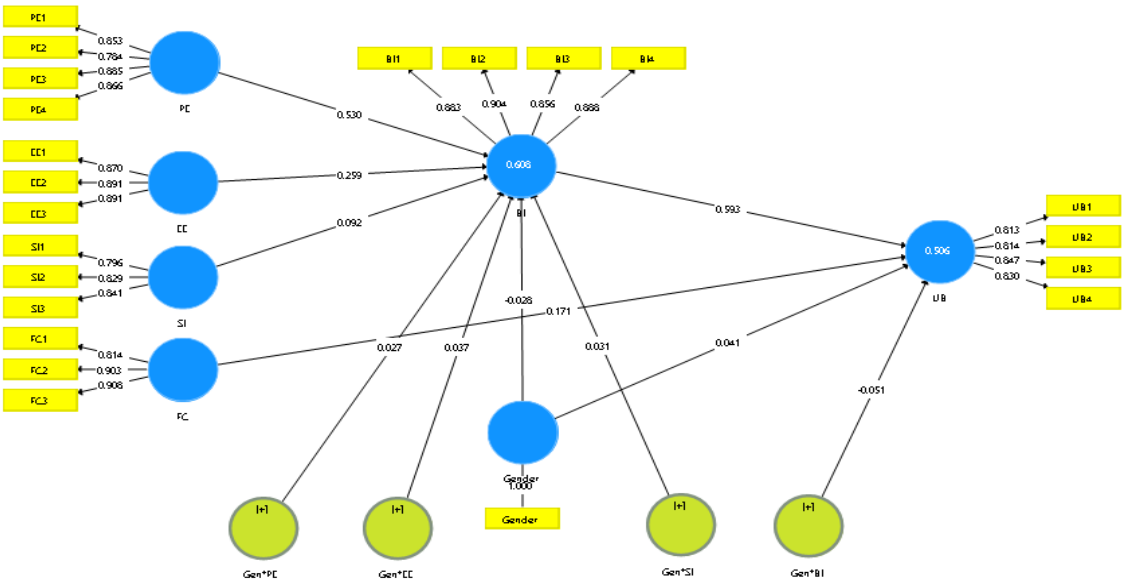


Table 6 shows the path coefficients for all constructs. As it is possible to observe, all T-values exceed ±1.96 at 5% level except for the relation between gender and main constructs (BI, EE, PE, SI, UB); therefore, all hypotheses except gender variable are empirically supported.

Table 6

Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Result
BI -> UB	0.593	0.591	0.051	11.601	0.000	Supported
EE -> BI	0.259	0.261	0.065	3.982	0.000	Supported
FC -> UB	0.171	0.170	0.058	2.941	0.003	Supported
Gen*BI -> UB	-0.051	-0.048	0.057	0.900	0.368	Not supported
Gen*EE -> BI	0.037	0.049	0.049	0.744	0.457	Not supported
Gen*PE -> BI	0.027	-0.006	0.070	0.379	0.705	Not supported
Gen*SI -> BI	0.031	0.035	0.038	0.818	0.414	Not supported
Gender -> BI	-0.028	-0.027	0.032	0.857	0.392	Not supported
Gender -> UB	0.041	0.040	0.037	1.111	0.267	Not supported
PE -> BI	0.530	0.530	0.055	9.719	0.000	Supported
SI -> BI	0.092	0.089	0.046	1.983	0.048	Supported

Discussion

The current study was designed to explore the different factors and drivers that could affect students' behavior in the usage of mobile technologies for English learning.

This study attempts to provide some insights into the different drivers that could affect the behavior of the pre-service teachers in the English department on using mobile technologies for English learning.

The analysis showcases that five out of eleven hypotheses were supported. BI has a significant effect on UB (t-statistics :11.601; $p < .000$). The positive effect of BI on UB supports (Al-Gahtani, 2016; Al Arif & Handayani, 2021; Park, 2009; Weng et al., 2018). Similarly, it was informed that PE influence BI (t-statistics 9.719; $p < .000$). In this study context, the perceived usefulness and effectiveness of mobile technologies can improve students' intention to use mobile devices in learning English. Besides, BI was also significantly influenced by EE (t-statistics 3.982; $p < .000$); the more pre-service teachers believe in their ability to use mobile technologies during their English learning process in Indonesian universities, the better their intention to use them. Based on the result, SI has a significant influence on BI (t-statistics 1.983; $p < .048$). A similar result was informed that FC has a significant influence on UB (t-statistics 2.941; $p < .003$); it is undeniable that organizational and technical infrastructure can support the students' use of mobile technologies in learning English.

On the other hand, gender did not significantly moderate the influence of BI on UB (t-statistics 0.900; $p < .368$), PE on BI (t-statistics 0.379; $p < .705$), EE on BI (t-statistics 0.744; $p < .457$), and SI on BI (t-statistics 0.818; $p < .414$). This result might refer that the gender variable is not related to BI, UB, PE, EE, and SI regarding the usage of mobile technologies for learning English. The result is not in line with a previous finding by Wang et al. (2009), informing gender has a significant influence on the intention to use technology. The result of this current study on gender variables is in line with the study done by Taj et al. (2017) who reported that there was no significant influence on the performance of the respondents based on gender when they worked in a computer-assisted learning environment.

However, four main constructs of UTAUT (PE, EE, SI, and FC) were reported to become significant drivers for UB (Hamidi & Chavoshi, 2019; Weng et al., 2018). A similar result regarding behavioral intention to use mobile technologies in Portugal universities was also reported by Briz-Ponce et al. (2017). When the respondents' high PE and EE, the BI will be increased. The Social Influence of using mobile devices triggers the increase of usage of mobile technologies in learning English. A plausible reason might be that pre-service teachers' behavioral intention to use is a significant factor in improving their academic performance (Mallya et al., 2019). The part of these findings can be a guideline for the government to improve the usefulness and benefits of the use of mobile technologies for English language learning.

The findings of the study share insights into how Indonesian pre-service teachers have interaction and value regarding the behavioral intention to implement mobile technologies during their learning that will affect their ways of teaching in the future. The findings also offer information about the design and implementation of mobile technologies for English language learning. The relationships between variables proposed

by this study could be a guideline and very beneficial for pre-service teachers to use mobile devices in learning English. The organization and institution support, such as the availability of infrastructure, tools, and human resources, are significant in supporting the students' usage of mobile technologies. Therefore, the implications offered by this study are expected to go beyond the report of the validation of the structural model.

Conclusion

The present study presents internal consistency reliability and suggests the validity of the pre-service teachers' perceptions of mobile technologies and the use of apps moderately positive. Findings suggest that the participants have strong attitudes towards mobile-assisted language learning (MALL), and they are willing to implement it. However, they have a good willingness to adopt it (Behavioral intention), and it will affect the students' usage behavior of mobile technologies.

Performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating condition (FC) are important factors that could affect the behavioral intention (BI) of using Mobile technologies for learning English. On the other hand, gender as a moderator variable is not significantly moderating the influence of PE, EE, and SI on BI. In addition, the result of this study revealed that the behavioral intention (BI) to use has a significant influence on usage behavior (UB) of mobile technologies in learning English.

There were two main limitations in this study. First, there were more female respondents than males, which may limit the findings' generalizability. Second, two of the researchers are also lecturers of all the respondents in the English education department. On the one hand, this may have an impact on the validity of the results due to its implicit influence on participants' views, emotional reactions, and/or questionnaire responses. However, the investigator's active engagement puts us in a better position to thoroughly observe and investigate the respondents' behavior and reaction.

Future research is encouraged to analyze the results obtained and the benefits as well as the drawbacks to encourage pre-service teachers' usage of mobile devices and apps for learning English and then contribute to the innovation in the English education sector. In addition, it should be recommended to extend the research model and/or compare the collected data by using other groups and constructs such as age and experience to explore the impact of these extended variables on the model.

In summary, the understanding of the factors affecting the use of new technologies could improve the quality of the English learning process, and allow pre-service teachers to benefit from the potential and advantage of mobile technologies. In addition, the findings promote and encourage the integration of mobile-assisted language learning as an innovative approach in English language teaching.

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Appendix 1

Instrumentation

Variable	Definition	Indicator	Items	Adapted References of the survey instrument
Performance Expectancy	the degree to which an individual believes that using the mobile device will help him or her to attain gains in English learning	1. useful 2. learn more quickly 3. Improving effectiveness	1. I would find the mobile device useful in English learning. 2. Using the mobile device enables me to accomplish tasks more quickly. 3. Using the mobile device increases my productivity. 4. Using mobile device makes English learning more effective	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.
Effort Expectancy	the degree of ease associated with the use of the mobile device for ELL	1. Easy to be learnt 2. Easy to be used	1. It would be easy for me to become skillful at using the mobile device for ELL 2. I would find the mobile device system easy to use. 3. Learning to operate the mobile device system is easy for me.	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.
Social Influence	the degree to which an individual perceives that important others believe he or she should use the mobile device for ELL	1. Friends influence 2. Lecturers influence	1. My friends think that I should use the mobile device for English Language learning 2. The lecturers have been helpful in the use of mobile device for ELL 3. In general, campus has supported the use of the mobile device system for learning.	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.

Facilitating Conditions	the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the mobile device system.	1. Having resources 2. Having knowledge 3. Having skills	1. I have the resources necessary to use the mobile device for ELL. 2. I have the knowledge necessary to use the mobile device system for ELL. 3. I have the skills necessary to use the mobile device system for ELL.	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.
Behavioral Intention	An individual's overall affective reaction to using a mobile device system.	1. Intend to use 2. A positive attitude towards the use of mobile device for ELL	1. I am interested in using mobile device for ELL 2. I am happy to use mobile device for ELL 3. The use of mobile device for ELL is a positive thing 4. I intend to use the mobile device in learning English.	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.
Use Behavior	The frequency of using mobile device and the approximate number of times that the participants use of mobile device in a given period of time.	1. The actual use of ICT 2. The frequency of ICT actual use 3. User satisfaction of ICT use 4. Conveying user satisfaction to others	1. I use mobile device for ELL on campus and at home 2. I use mobile device for ELL regularly every day 3. I am satisfied learning English using mobile device 4. I convey my satisfaction towards the use of mobile device for ELL to my friends	Venkatesh et al, (2003) User Acceptance Of Information Technology: Toward A Unified View. MIS Quarterly Journal (27-3), 425-478.