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Investigating the facilitating conditions, perceived ease of use and usefulness of mobile-assisted language learning

Saman Ebadi^{1*}  and Ali Raygan¹

*Correspondence:
samanebadi@gmail.com

¹ Razi University, Kermanshah,
Iran

Abstract

Mobile technologies and factors influencing English as a foreign language (EFL) learners' willingness to integrate them into their learning processes are significant. This study aims at investigating the role of facilitating conditions, perceived ease of use, and perceived usefulness as factors in predicting Iranian EFL learners' perceptions toward mobile-assisted language learning (MALL). Accordingly, data were collected from 223 Iranian EFL learners who had their English language courses in the two major educational contexts (i.e., public schools and private institutes). Considering the first phase of the study, a statistically significant relationship was found between the three hypothesized factors (i.e., facilitating conditions, perceived ease of use, and perceived usefulness) and learners' perceptions toward MALL. Furthermore, the facilitating conditions were associated with learners' perceived ease of use. Regarding the second phase of the study, the analysis of the path coefficients indicated a significant predictive power of perceived usefulness on perceptions toward MALL. Also indicated in this study is the significant effect of facilitating conditions on learners' perceived ease of use. The results are discussed in the light of the literature, and suggestions for further research are provided.

Keywords: MALL, Facilitating conditions, Perceived ease of use, Perceived usefulness, Perceptions toward MALL, Iranian EFL learners

Introduction

The practicality of smartphone technology in enhancing classroom instruction has made substantial developments in the field of EFL education (Taleb & Sohrabi, 2012). For example, presenting approaches toward more classroom engagement (Martin & Ertzberger, 2013), the provision of multiple platforms alongside a variety of instructional strategies (Yang, 2013), and the implementation of effective strategies for language improvement (Golshan & Tafazoli, 2014) are a number of improvements made by mobile technologies in EFL (English as a foreign language) context. Furthermore, by providing an authentic learning environment for language learners (Avci & Adiguzel, 2017), technological tools such as smartphones have simplified the process of language learning achievement (Cho et al., 2018). In other words, mobile phones can

provide opportunities for language learners to practice outside the classroom (Alshammari, 2020) and foster their language learning process through the adoption of various learning strategies (Gao & Shen, 2021). Thus, MALL is considered a critical element in classrooms and other academic contexts (Vafa & Chico, 2013).

Considering its significance in EFL education, as mentioned above, previous studies have identified factors associated with M-technology adoption in EFL learning. In this regard, the provided guidance and support by teachers (Wang, 2017), enjoyment and interactivity of the mobile phones and applications coming alongside them (Zhang & Perez-Paredes, 2019), and the easiness and usefulness of using mobile phones in EFL education (Alhadiah, 2020) are referred to as fundamental elements predicting the integration of mobile devices into EFL context.

Further, a number of studies (e.g., Alasmari & Zhang, 2019; Ali & Arshad, 2016) have also addressed the notion of facilitating conditions as one of the factors in relation to learners' perceptions of the actual use of mobile devices. As proposed, Language learners' attitudes regarding MALL integration, as well as their actual behavior in using it, are influenced by the facilitating conditions (Botero et al., 2018). Moreover, despite having no direct association with learners' perceptions toward using mobile phones in some cases, facilitating conditions were found as significant indirect predictors of language learners' behavioral intentions toward using mobile phones (Hoi, 2020). Followed by facilitating conditions are the learners' perceptions regarding the usefulness of smartphones (i.e., perceived usefulness). As noted previously, learners' positive perceptions toward MALL's usefulness influence their learning achievement (Cheng & Chen, 2019) and predicts language learners' behavioral intentions toward MALL (Haung et al., 2020). Also widely investigated is the learners' perceived ease of use. Same as the two previously mentioned factors (i.e., facilitating conditions and perceived usefulness), learners' perceptions of MALL ease of use act as a determining factor in predicting learners' intentions to adopt mobile devices (e.g., smartphones) (Aburub & Alnawas, 2019), impacts their choice of MALL (Alhadiah, 2020), and, most importantly, provides them with a more positive experience of flipped learning via using mobile devices (Andujar et al., 2020).

Despite the significant impact of the three above-mentioned elements (i.e., facilitating conditions, perceived usefulness, and perceived ease of use) on learners' propensity to use mobile technologies in classes, no research has probed their predictive power as a group of factors influencing learners' perceptions toward MALL through measuring their direct and indirect effects. Furthermore, while learners' perceived ease of use has been referred to as a predictor of creating a positive perception toward MALL use (e.g., Hsu & Lin, 2022; Lizamuddin et al., 2019), studies have missed investigating the factors that may influence learner' perceived ease of use. This meant various factors (e.g., facilitating conditions) need to be overlooked in terms of their potential predictive power on learners' perceived ease of use. Accordingly, this study examined the role of facilitating conditions as a predictor for language learners' perceived ease of use while using smartphones, as well as a mediator in building a positive attitude toward MALL integration. The indirect effect of facilitating conditions on language learner perceptions toward MALL use through the mediation of their perceived ease of use is also investigated.

Finally, to the best of our knowledge, none of the previous studies have investigated the predictive power of the three factors on EFL learners' perceptions toward MALL considering the context of Iran. Therefore, this study is an attempt to explore Iranian EFL learners' perceptions of the predictive power and (in) direct impact of the facilitating conditions, perceived ease of use and usefulness of MALL. Respecting the gaps found in the literature, as mentioned above, the following research hypotheses guided the study:

Hypothesis 1 Perceptions toward MALL are predicted by facilitating conditions, perceived ease of use, and perceived usefulness.

Hypothesis 2 Facilitating conditions have a direct impact on learners' perceived ease of use within EFL education.

Hypothesis 3 Perceived ease of use mediates between facilitating conditions and perceptions toward MALL.

With respect to the above-mentioned hypotheses, the proposed model for this study is illustrated in the Fig. 1.

A review of literature

Mobile-assisted language learning (MALL)

Mobile-assisted language learning, as the name signifies, targets the integration of mobile phones in the process of language learning. Accordingly, many studies have examined the decisive role of MALL by addressing the positive aspects of its use in the EFL context. Following a qualitative procedure, Ozer and Kilic (2018) investigated 63 EFL learners by analyzing their responses to open-ended questions about their MALL experiences. As the findings illustrated, the more learners integrated mobile phones into their learning process, the greater their academic accomplishment would be. A multiple regression study of 348 Vietnamese students' intentions on the use of smartphones revealed that mobile devices were highly appealing to students thanks to their benefits of use. However, when it comes to mobile technology use, factors such as versatility and affordability should be taken into account (Loewen et al., 2019). More recently, Sad et al. (2020) investigated the effects of using mobile phones on a group of 428 foreign language learners in Turkey. The findings revealed that enhanced language learning experiences was highly associated with the adoption of smartphones.

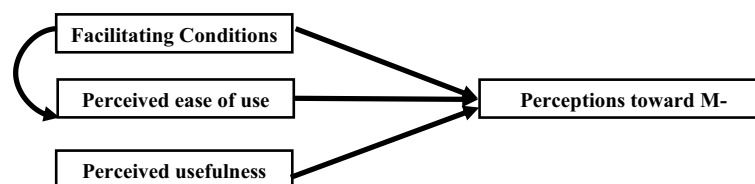


Fig. 1 The proposed conceptual model for the relationship between facilitating conditions, perceived ease of use, perceived usefulness, and learners' perceptions toward MALL

Facilitating conditions and MALL

The facilitating conditions, referred to as the strongest determinant of intention toward the use of technological advancements in the EFL context (Mei et al., 2018), have been studied extensively in relation to their impact on EFL learners' perspectives toward MALL. For example, Nassoura's (2012) study examined the factors influencing learners' intentions toward using MALL in Saudi Arabia. As the results from the learners' self-reports indicated, carrying attitudes (positive or negative) toward mobile technologies may build learners' behavioral intentions toward utilizing MALL. However, learners' positive or negative attitudes are linked to their perceptions of the facilitating conditions. This meant that facilitating conditions play a decisive role in generating positive perceptions toward MALL use. Kondo et al. (2012) proposed that facilitating conditions (e.g., teacher support) are considered as preliminary elements for being equipped while using MALL and ensure the credibility of the situation in this regard. More precisely, learners' self-perceptions indicated that their attitude toward using MALL highly relates to the extent to which they are supported in this regard. Facilitating conditions, therefore, contain salient features which project learners' actual behavior of MALL use. In line with the literature highlighting the predictive role of facilitating conditions on learners' willingness to integrate mobile technologies, Botero et al. (2018) conducted a structural equation modeling procedure. The results revealed that facilitating conditions predict students' attitudes with respect to utilizing MALL in their learning processes. In other words, facilitating conditions (e.g., free access to internet connectivity) have a great impact on improving learners' behavioral intentions toward the use of MALL. More recently, AlMarwani (2020) examined a group of 878 EFL university students with respect to incorporating mobile phones into the realm of language learning and factors determining their use of mobile phones for a better educational experience. According to the findings of the study, the educational support provided by instructors regarding the use of mobile technologies (i.e., facilitating conditions) was considered the predictor of learners' intentions to use mobile phones for language learning.

Despite being widely noted that facilitating conditions play a pivotal role in building up EFL learners' perceptions toward MALL, there still exists a controversy regarding the positive impact of facilitating conditions since some studies (e.g., Hoi, 2020) found no direct relationship between the two elements. Furthermore, unlike their focus on the direct impact of facilitating conditions on learners' perceptions toward MALL, studies have missed investigating the extent to which facilitating conditions may influence learners' intention to use mobile devices via the mediation of other factors (e.g., perceived ease of use). Finally, studies presenting a comprehensive MALL acceptance model are still scarce (Al-Emran et al., 2018), and this means, there is still room for conducting more research in this regard.

Due to gaps in the research addressing the impact of facilitating conditions on learners' perceptions of MALL usage, this study aimed to evaluate the effect of facilitating conditions in providing learners with a more positive perception of MALL use. Moreover, unlike the previous research, this study investigated the indirect role of facilitating conditions on perceptions toward MALL through the mediation of perceived ease of use.

Learners' perceptions toward MALL usefulness

Previous studies have investigated multiple factors contributing to learners' perceived usefulness of MALL (Ali et al., 2019; Yang et al., 2022) and the extent to which mobile technologies have impacted their language learning practices. Of the factors being investigated, learners' level of competence is considered as a critical element in predicting their perceived usefulness of MALL. Conducting an activity-oriented design, Hsu's (2013) study investigated a group of language learners while utilizing mobile devices in the allotted time frame. As the reports indicated, learners' digital literacy mattered when it came to using mobile devices for learning purposes. Furthermore, surveying a group of Malaysian students, the study by Azli et al. (2018) confirmed that learners' prior knowledge and competence for learning via mobile phones influence their perceptions of MALL and its usefulness.

More specifically, learners' perceptions of MALL usefulness have been examined using various mobile applications. In this regard, Xu et al. (2017) recruited a total of 35 Chinese EFL students. While receiving feedback from the instructor via their smartphones, most of the students agreed that the feedback they received improved their overall speaking ability and pronunciation. Furthermore, regarding the role of smartphones and related applications (such as Quizlet) in English vocabulary learning, it has been discovered that mobile devices are helpful as they provide learners with efficient and innovative approaches to learning vocabulary in a foreign language (Alhadiah, 2020). In the same vein, Students surveyed by Khan et al. (2021) have considered WhatsApp as an enjoyable and convenient form of learning and academic engagement. As it is illustrated, the above-mentioned studies have merely focused on learners' intentions regarding the usefulness of mobile phones in EFL education. In other words, the extent to which learners' perceptions about MALL's usefulness may predict their intentions to employ mobile phones in actual language learning activities has been ignored. As a result, this study hypothesizes learners' perceptions of MALL usefulness are a predictor of their perceptions of MALL integration in the EFL context of Iran. The results of the study can provide a broader insight into the learners' positive intentions in using mobile devices during the process of EFL education.

Learners' perceived ease of use

Learners' behavioral intentions toward the use of mobile phones have also been investigated through the lens of their perceptions of the easiness of using mobile phones. In this regard, Sun and Gao (2020) indicated that the notion of task technology fit is directly associated with learners' perceptions regarding the convenience of using mobile phones in educational processes. Alternatively stated, individuals who find smartphones and related applications easier to implement tend to consider them more useful and beneficial for doing English learning activities. Examining learners' self-reports regarding the easiness of using mobile phones, Zhang & Perez-Paredes (2019) indicated that as soon as learners find mobile devices considerably easier to use via having a more user-friendly interface, they may develop more positive attitudes concerning MALL use.

In addition to the established role of learners' perceived ease of use as a predictor for perceptions toward MALL, studies have also investigated factors that may predict learners' perceived ease of use. For instance, Dashtestani (2016) mentioned factors such

as lack of wireless internet connection, learners' low digital literacy, and their lack of knowledge regarding the use of mobile phones as determining factors in providing the learners with positive perceptions toward the easiness of MALL. To put it another way, the fewer the above-mentioned distractions are, the more positive the learners' perception of ease of use will be. In a similar vein, Ali et al. (2019) indicated that external factors could be considered a predictor that can influence language learners' perceptions of the easiness of using mobile phones. Moreover, since mobile phones are user-friendly and portable, learners find it easy to use them for language learning. This supported the idea that mobile phones are becoming more widely accepted and used among language learners than before.

However, despite investigating learners' perceived ease of use both as a predictor and a variable that may be predicted by other variables (e.g., external factors), previous studies did not examine learners' perceived ease of use acting as a mediator for predicting learners' propensity to use mobile phones. As a result, the purpose of this paper is to incorporate learners' perceived ease of use as a mediator between facilitating conditions and their perceptions toward MALL.

All in all, the hypothesized model is different in comparison to other previously established models with respect to the factors included (facilitating conditions, perceived ease of use, and perceived usefulness) and the paths defined in the model (e.g., the mediating effect of perceived ease of use).

Methodology

Participants

A total of 223 Iranian EFL students (83 males and 140 females) participated in this study. The respondents had their language learning courses in the two major educational contexts (public schools and private institutes) located in five different regions in western Iran. The participants' age ranged between 23 and 35, and they varied from less than a year to 10 years with respect to their experience of using mobile phones for language learning purposes. However, concerns regarding the homogeneity of learners considering their learning experiences with MALL have been taken into account. With that in mind, over 90% of the selected learners were either experiencing their 1st (71.7%) or 2nd (23.3%) year of using mobile phones for language learning. Only 5% of the participants were experiencing MALL over a two-year period. The participants majored in English Literature (55.2%), English Language Teaching (26.0%), and Translation studies (10.3%). The rest of the respondents (8.5%) had degrees in other fields of study (e.g., physics, mathematics, etc.). All participants were assured that their answers to questionnaire items would be kept confidential and used only for research purposes.

Instrumentation

Multiple questionnaires validated by prior studies were used to investigate the factors influencing EFL learners' perceptions of MALL. The questionnaire targeting EFL learners' perceptions toward the use of MALL was adopted from Chen's (2017) study. The questionnaire items are focused on promoting the use of mobile phones in EFL classes with the goal of language learning. The respondents were asked to answer each of the items on the basis of a 5-point Likert scale ranging from 1 (strongly disagree) to 5

(strongly agree), comprising a total number of 10 items. The sample items for this variable are “I am keen on learning English via mobile phones” and “MALL has been extensively used in English as a foreign language (EFL) learning context”.

The surveys used by Lizamuddin et al. (2019) were adapted so as to target the two factors addressing EFL learners’ perceived usefulness (10 questions) and ease of use (10 items). The two surveys were originally developed by Davis (1993). However, the reason for using the modified version of the questionnaires in this study was the appropriateness of the items regarding the notion of MALL in the Iranian EFL context in comparison with the original one. The answers to both questionnaire items were measured on the basis of a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The sample items regarding the learners’ perceived usefulness are “Making use of smartphones enhances the quality of my performance” and “Using a smartphone (MALL) can make English learning easier.” With regards to the notion of perceived ease of use, the sample items are “I can easily operate the MALL” and “Using MALL for doing what I need is easy and beneficial.”

Finally, targeting the learners’ perceptions of the facilitating conditions, the questionnaire developed by Botero et al. (2018) was utilized. This questionnaire comprised six items, and the measurement of the respondents’ answers were conducted based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The sample items of this questionnaire are “I can easily access mobile-based technological devices (e.g., smartphones or tablets)” and “I am provided with enough support in case I face issues with a smartphone or tablet while learning foreign languages.”

Data collection and analysis procedure

This study included a quantitative approach to the processes of data collection and analysis procedure. A total of 270 questionnaires were distributed among Iranian EFL learners in the form of hard copies and email attachments over nine months, from December 2020 to August 2021, before the collection process was conducted. During the collection process, the number of the collected questionnaires was reduced to 223 because of discarding the incomplete or, in some cases, carelessly completed questionnaires. The collected data was then entered into the latest version of the SPSS statistical package to confirm Cronbach’s Alpha and the internal consistency of the questionnaire items. Followed by this, a series of Pearson product-moment correlations were conducted to find out the relationship between Iranian EFL learners’ perceptions of MALL and the facilitating conditions, their perceived ease of use, and MALL usefulness.

After determining that the variables for the current study had acceptable psychometric properties (e.g., normality of distribution), the three variables (facilitating conditions, perceived ease of use, and perceived usefulness) were tested using structural equation modeling (SEM) to find out if they could predict EFL learners’ perceptions toward MALL. SEM is a statistical modeling tool that is designed to reflect the causal relationship among a group of variables (Lei & Wu, 2007). More precisely, this analytical procedure aims at investigating the predictive power between multiple variables by drawing paths (arrows pointing from one of the variables to the other ones). This signifies whether or not the hypothesized variable can act as a cause predicting the other variables. For the path diagram designed in the current study, three of the factors

(facilitating conditions, perceived ease of use, and perceived usefulness) are the hypothesized predictors of learners' perceptions of M-learning. Moreover, a path directed from facilitating conditions toward perceived ease of use reflects the possible causal relationship between the two factors. The analysis procedure is provided by running a series of multiple regression analyses to find out about the consistency of the collected data and the hypothesized model. Accordingly, the analysis procedures regarding the predictive power of the hypothesized variables were conducted using the AMOS statistical package (22nd version). Referring to Hox and Bechger (1998), the maximum likelihood estimation using AMOS can be performed via a reasonable sample size of at least 200 participants. Accordingly, the current study was able to reach the sample size limit by recruiting 223 EFL students. Following the first design of the model, a number of alternate models were redesigned in order to recheck the maximum likelihood estimation and model fit values. In the end, the study's hypothesized model provided the best model fit requirements. More precisely, the models were compared and analyzed based on their chi-square (X^2), minimum sample discrepancy (CMIN), Tucker-Lewis index (TLI), degree of freedom (df), Comparative fit index (CFI), Goodness of fit index (GFI), Adjusted Goodness of fit index (AGFI), and finally, root-mean-square error of approximation (RMSEA). However, since creating an AMOS model with an absolute model fit that meets all of the standards is difficult, researchers are more likely to pursue the greatest model fit in which the major number of the fit indices match the requirements.

Results

Descriptive statistics

In order to provide the information regarding the descriptive statistics of the collected data, Mean scores, Alpha ranges, skewness, and kurtosis indices, and the maximum and minimum ranges were illustrated. In this regard, as depicted in Table 1, the values for the scales of kurtosis and skewness ranged from -1.9 to -0.70 and 2.2 to 5.0 , signifying that the questionnaire items enjoyed relatively high normality of distribution. Moreover, the Cronbach Alpha values, ranging between 0.32 and 0.89 , suggested that the participant's responses to individual items underlying each of the four variables (i.e., Facilitating conditions, perceived ease of use, perceived usefulness, and perceptions toward MALL) enjoyed a relatively high internal consistency.

Table 1 Descriptive statistics of learners' responses to Facilitating conditions, perceived ease of use, perceived usefulness, and perceptions toward the use questionnaire items

	Facilitating Conditions	Perceived ease of use	Perceived usefulness	Perceptions toward M-learning
Mean	4.24	1.77	1.79	3.33
Standard Deviation	0.41	0.10	0.24	0.61
Maximum	5.00	2.00	2.00	4.50
Minimum	2.17	1.20	1.10	1.20
Alpha	0.64	0.32	0.89	0.83
Skewness	-0.70	-1.58	-1.96	-1.79
Kurtosis	2.79	5.06	2.26	2.75

Correlations between EFL learners' facilitating conditions, perceived usefulness, perceived ease of use, and perceptions toward MALL

To examine the relationship between the variables (i.e., facilitating conditions, perceived usefulness, perceived ease of use, and perceptions toward MALL), a series of Pearson Product-Moment Correlation coefficients were conducted via SPSS (21st version). As illustrated in Table 2, a strong and significant positive relationship was captured between EFL learners' perceived usefulness and perceptions toward M-learning ($r=0.82$, $p=0.000$). Furthermore, a weak, though significant, positive relationship was captured between EFL learners' perceptions of facilitating conditions and their perceptions of M-learning strategies ($r=0.17$, $p=0.009$). Also captured was the significant positive relationship between learners' perceived ease of use and perceptions toward MALL ($r=0.25$, $p=0.000$). Finally, the results demonstrated a weak, though significant, positive relationship between the facilitating conditions and learners' perceived ease of use ($r=0.28$, $p=0.000$). The criteria for evaluating the weight of the correlations are taken from Akoglu's (2018) study.

Measurement model

Maximum likelihood estimation for the hypothesized model was analyzed via examining the model fit indices, as illustrated in Table 3. As the indices ($\chi^2=34.118$, $df=2$, $p=0.000$) signified, the hypothesized model for the current study indicated an acceptable model fit. Moreover, other indices, including $NFI=0.89$, $CFI=0.89$, $IFI=0.90$, and $GFI=0.93$, revealed acceptable model fit, which meant the maximum likelihood estimation of the current hypothesized model was ensured. It is noteworthy that the current model was selected as the study's hypothesized model since it captured the highest model fit indices compared to the previous ones. Accordingly, among the four

Table 2 Pearson correlation between Facilitation conditions, perceived ease of use, perceived usefulness, and perceptions toward M-learning

	Facilitating conditions	Perceived ease of use	Perceived usefulness	Perceptions toward M-learning
Facilitating conditions				
Pearson correlation	1	0.28**	–	0.17**
Sig. (2-tailed)	–	0.000	–	0.009
<i>N</i>	223	223	–	223
Perceived ease of use				
Pearson correlation	–	1	–	0.25**
Sig. (2-tailed)	–	–	–	0.000
<i>N</i>	–	223	–	223
Perceived usefulness				
Pearson correlation	–	–	1	0.82**
Sig. (2-tailed)	–	–	–	0.000
<i>N</i>	–	–	223	223
Perceptions toward M-learning				
Pearson correlation	–	–	–	1
Sig. (2-tailed)	–	–	–	–
<i>N</i>	–	–	–	223

** $p < 0.01$

Table 3 Fit indices for the measurement model (n = 223)

	NFI	CFI	IFI	GFI	AGFI	CMIN(χ^2)	RMSEA	df
Measurement model values	0.89	0.89	0.90	0.93	0.66	34.118	0.26	2
Criteria	> 0.90	> 0.90	> 0.90	> 0.90	> 0.90		< 0.1	

Table 4 Results from testing the hypotheses using parameter estimates (direct and indirect effects)

Path			Path coefficient	P-value
Facilitating Conditions	→	M-Learning	0.036	0.345
MALL Usefulness	→	M-Learning	0.834	***
MALL Ease of Use	→	M-Learning	− 0.065	0.090
Facilitating Conditions	→	MALL Ease of Use	0.284	***

variables (comprising three research questions), three of them (i.e., Facilitating conditions, perceived ease of use, and perceived usefulness) were hypothesized as predictors to learners’ perceptions toward MALL. Moreover, learners’ perceived ease of use was hypothesized to mediate their perceptions of the facilitating conditions and willingness toward M-learning. Despite the fact that the current model ensures maximum likelihood estimation, some of the model fit indices (e.g., RMSEA = 0.26 and AGFI = 0.66) did not meet the requirements due to their standardized criteria. However, the two indices were superior to those in prior hypothesized models, even with the mentioned values.

Hypothesis testing

The first hypothesis of this study examined whether or not the three hypothesized factors (i.e., facilitating conditions, perceived ease of use, and perceived usefulness) predict EFL learners’ perceptions toward MALL. In this regard, the study results (as presented in Table 4) indicated a significant relationship between EFL learners’ perceived usefulness regarding mobile phones and their perceptions toward MALL ($r = 0.83, p = ***$). More specifically, as the path coefficients analysis demonstrated, those who have a positive attitude regarding the utility of mobile phones in their language learning processes had more positive perceptions toward MALL. Despite the positive significant predictive power of MALL’s usefulness on learners’ intentions toward mobile technologies, the learners’ perceptions of facilitating conditions ($r = 0.03, r = 0.34$) and their perceived ease of use ($r = - 0.06, p = 0.09$) do not indicate any significant predictive power on perceptions toward MALL.

The study also considered the possible significant predictive power of facilitating conditions on learners’ perceived ease of use. In this regard, a statistically significant positive relationship was captured between EFL learners’ perceptions of facilitating conditions and their perceived ease of use ($r = 0.28, p = ***$) by analyzing the direct path coefficients. In other words, positive perceptions toward facilitating conditions can predict EFL learners’ tendency toward mobile technologies considering their ease of use.

Finally, the third hypothesis examined the indirect effect of facilitating conditions on learners’ perceptions toward MALL through the mediation of perceived ease of use. For

learners’ perceived ease of use to act as a mediator, the two path coefficients between facilitating conditions and perceived ease of use, and perceived ease of use and perceptions toward MALL should be statistically significant. The results indicated that the former path depicted a statistically significant predictive power from facilitating conditions toward perceived ease of use ($r = 0.28, p = ***$). Meanwhile, the results did not reveal significant predictive power of perceived ease of use toward MALL perceptions ($r = -0.06, p = 0.090$). The non-significant results from the second path coefficient proved that learners’ perceived ease of use didn’t act as a successful mediator between the two above-mentioned factors (facilitating conditions and perceptions toward M-learning). The regression weights are illustrated in Fig. 2.

Discussion

This study was an attempt to examine the learners’ propensity to integrate mobile phones into their process of language learning in relation to the hypothesized predictors (i.e., facilitating conditions, perceived usefulness, and perceived ease of use). Moreover, learners’ perceived ease of use was considered as a mediator between the facilitating conditions and perceptions toward MALL. As the results indicated, a significant predictive relationship was captured between learners’ facilitating conditions and perceived ease of use. As established throughout the literature, facilitating conditions are referred to as external factors (Al-Emran et al., 2018), which may act as significant predictors for learners’ perceived ease of use (Guo et al., 2020). Accordingly, the findings of this section of the study support the literature (e.g., AlMarwani, 2020; Botero et al., 2018) regarding the predictive role of facilitating conditions and their significance in developing learners’ comfort with mobile phone integration.

Moreover, although previous studies have merely focused on establishing results regarding the extent to which mobile phones are useful (Azli et al., 2018; Hsu, 2013; Khan et al, 2021), the results of this study broaden the previous research findings signifying that learners’ perceived usefulness of MALL can act as a predictor for learners’ perceptions toward M-learning. In other words, learners who carry positive ideas regarding the usefulness of mobile devices in education are more willing to integrate them into their actual language learning process.

The non-significant predictive power of facilitating conditions on learners’ perceptions toward MALL can be explained by the wide range of features they contain. Since facilitating conditions are considered as external variables (Al-Emran et al., 2018), it is

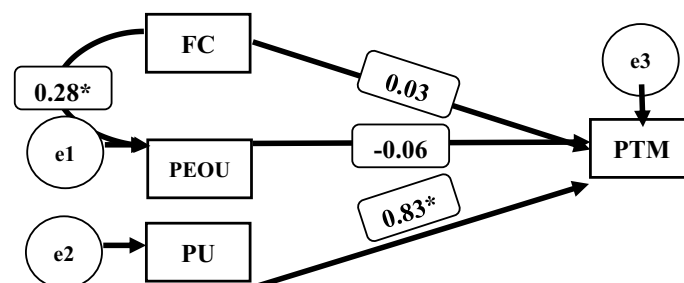


Fig. 2 The proposed conceptual model for the relationship between facilitating conditions, perceived ease of use, perceived usefulness, and perceptions toward M-learning

plausible to assume that the diverse results regarding its significant role are due to a variety of external factors influencing the learners' intentions to use MALL. Furthermore, the insignificant results in terms of the predictive value of learners' perceived ease of use could be explained by their prior experience with mobile phones. More precisely, the notion of experience is in direct association with practice (Erslani, 2015). As a result, it's reasonable to assume that only learners who have had positive and comfortable experiences with mobile devices will find them easy to use.

Conclusion

This study investigated the relationship between facilitating conditions, perceived usefulness, perceived ease of use, and perceptions toward MALL. In this regard, a strong positive and significant relationship was captured between perceived usefulness and perceptions toward M-learning. Meanwhile, a weak though significant relationship was captured between facilitating conditions and perceived ease of use. Findings were the same respecting the relationship between perceived ease of use and MALL perceptions, and that of facilitating conditions and MALL learning perceptions. Regarding the second phase of the study, perceived usefulness was found to be a significant predictor of learners' perception of MALL. Furthermore, facilitating conditions were found to have significant predictive power on learners' perceived ease of use.

This study had a number of limitations. First, the results, being consistent with Hoi (2020) and contradictory with Nassoura (2013), should be interpreted with caution due to the limited and insignificant predictive power of facilitating conditions on learners' perceptions of MALL. Therefore, in order to obtain more reliable and comprehensive results, future studies could focus on a more extensive survey targeting the facilitating conditions. Second, this study had only hypothesized three of the existing factors as possible predictors for learners' intentions toward mobile use. Future studies can re-examine the likely predictors of learners' intentions to utilize mobile phones by including other elements that have been overlooked or inadequately addressed in previous studies. Finally, the insignificant result about the direct effect of perceived ease of use on perceptions of MALL might be re-examined using students from different contexts.

Appendix A: Facilitating conditions

Items

- I can easily access mobile-based technological devices (e.g. smartphones or tablets)
 - I can have internet connection (via Wi-Fi or data plan) on a smart phone or a tablet regularly and easily
 - I can access useful apps for foreign language learning on smart phones or tablets
 - I possess the sufficient knowledge to integrate smart phones or tablets so as to learn foreign languages
 - I am provided with enough support in case I face issues with a smart phone or tablet while learning foreign languages
 - I have access to a suitable place to use Wi-Fi by a smart phone or tablet to learn foreign languages
-

Appendix B: Perceived ease of use

Items

Learning a foreign language via smartphone (MALL) is not practical
 I can easily operate the MALL
 Having interactions through MALL is mostly frustrating
 Using MALL for doing what I need is easy and beneficial
 MALL is stiff and inflexible to use
 MALL makes is easy for remembering how I was supposed to perform my task
 A good mental effort is required for successful MALL interaction
 I have a clear and understandable interaction with MALL
 Becoming skillful in MALL integration requires a lot of practice
 All in all, I find the MALL easy to operate

Appendix C: Perceived usefulness

Items

Making use of smartphones enhances the quality of my performance
 The integration of smartphone only gives me facility to socialize through social media
 Smartphone enables me to complete the tasks more quickly
 Using smartphone (MALL) can make English learning easier for me
 Using smartphone (MALL) helps me be more productive
 Using Smartphone (MALL) paves the way for better task performance
 Using Smartphone (MALL) improves my effectiveness while doing a task
 Integrating smartphones (MALL) makes it easier to do my tasks
 Using smartphone (MALL) reduces my critical thinking
 Overall, Smartphones (MALL) are conducive to task performance

Appendix D: Learners' perceptions of MALL

Items

I am keen on learning English via mobile phones
 MALL has been applied to a variety of learning exercises in my English language class
 I prefer MALL courses to traditional ones
 MALL should be frequently applied to classroom activities
 MALL promotes learners' tendency to learn English
 Recent MALL developments lead to inspecting new methods /models at university level
 Using a mobile device makes me feel bored
 MALL has been extensively used in English as a foreign language (EFL) learning context
 I feel confident regarding the use of mobile devices for language learning
 Learners feel positive about MALL engagement in EFL context

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Author contributions

SE: Designed and conducted the procedures and reviewed the final draft, and made necessary revisions. AR: Collected the data and wrote the first draft. Both authors read and approved the final manuscript.

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Availability of data and materials

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The authors declare that they have no competing interests.

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