



Determinants of Mobile Applications Acceptance for English Language Learning in Universiti Utara Malaysia

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ABSTRACT

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The purpose of this study is to provide an overview of UUM students' experiences in using mobile applications for English language learning (MAELL) and to investigate factors affecting the students' intention to MAELL, gender and academic major differences in acceptance of mobile applications for English language learning, as well as barriers to using MAELL. A quantitative method was used to analyze data collected from 67° participants in Malaysia. The result indicated that Mobile applications have already become a necessity for UUM students and the majority of them (82.° %) had previous experience using MAELL. Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and self-management of learning were all significant factors that affect students' intention to use MAELL. Gender and academic major differences in acceptance of MAELL were also examined. Additionally, barriers to using MAELL were discussed in terms of English language learning issues. Finally, this study discusses implications, limitations, and proposed areas for future study. This study adds to the knowledge of how to use smartphones for language learning and provides useful insights on the acceptance of MAELL.

Keywords:

Performance expectancy, effort expectancy, social influence

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1. Introduction

In Malaysia, smartphone ownership has rapidly increased in recent years. English proficiency is regarded as a necessary skill for university students to get a job. Moreover, with the rising popularity of mobile technology, both formal and informal education in Malaysia is undergoing a shift from e-learning to m-learning. Despite the favorable external circumstances for m-learning, it still faces challenges. While numerous studies have investigated the use of mobile technologies in English language learning, few studies have been conducted to research university students' acceptance and usage patterns of smartphones in informal English learning. Thus, it is necessary to explore students' experiences with MAELL and examine various factors affecting their acceptance of MAELL. In order to adopt MAELL in educational environment, educators and app developers need to understand how UUM students use MAELL, and to what extent they accept them as a

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language learning tool. Thus, this study aims to fill in the gap in the current literature on the use of smartphone apps in order to support informal English learning in Malaysia.

2. Literature Review

In the past years, many researchers have demonstrated that mobile technology is an effective tool for improving English language skills such as vocabulary, listening, speaking, grammar, reading comprehension, and writing. Most of MALL studies focus on vocabulary acquisition and speaking skills, while grammar learning and writing skills are underrepresented [30].

2.1 Using Smartphone Apps in EFL

There is a great variety of apps for developing different language skills (vocabulary, reading, listening, speaking, and writing). The study categorized the mobile apps for independent language learning into dictionary apps, translation apps, language practice apps, flashcard apps, listening comprehension apps, newspaper apps, video apps, games, note taking apps, and chat or message apps [18]. With the use of game playing apps in L2 learning, many mobile apps enhance the language learning process and motivate the learners.

Another study proved the potential of built-in smartphone apps in a language classroom, including voice recorders, video cameras, timers and digital cameras [14]. The voice recorder allows students to record their conversations to evaluate pronunciation or record pair-presentations for practice and self-evaluation [6]. The video camera affords learners great opportunities to create digital stories for English learning [8]. The timer allows students to keep track of time spent on a task, or use a study aid to increase their motivation while studying. Furthermore, students can use the camera to take a picture of what is written on the board, such as teacher's instructions and assignments [8]. The cameras can also be used to develop speaking skills. For instance, students can take part in an activity where they introduce interesting photos from their camera rolls to the class.

Smartphone apps promote the ubiquity of language learning, make learners more autonomous, and give them access to rich resources anytime and anywhere [34]. They explored whether smartphone promotes autonomous learning in the ESL classroom. Most participants responded that they used their smartphones to plan their own learning, set learning goals, look up information, take pictures of notes and read them. They realized putting in their own efforts is crucial for the success of learning, which helped them make progress towards autonomous learning. The smartphone enables learners not only to make more efforts in their learning but also to reflect on their learning process. For example, the students can listen to intonation, volume and other phonological features of a language using speech recognition application. It pushes the learners towards becoming autonomous learners [13].

The study investigated the effectiveness of using mobile dictionaries in English learning [21]. The findings showed that EFL learners using mobile dictionary improved their English ability more than those using a paperback dictionary. Using mobile dictionary app also promotes the learners' motivation, creates a positive attitude towards learning a foreign language and lowers their anxiety in the language classroom. Furthermore, using a mobile dictionary in language classroom extends learning outside the classroom into everyday activities. Moreover, as foreign language learning requires repeated practice, mobile phones provide sufficient opportunities for learners to interact with the target language.

The study investigated the effectiveness of smartphone in helping ESL college students' vocabulary learning [32]. He claimed three deficiencies of learning vocabulary via SMS. First, the

text size on SMS was too small. Second, the SMS delivery method did not fully represent anytime, anywhere learning. Finally, learners did not have control over learning because they always had to wait for SMS. However, the technology of smartphone apps can overcome these deficiencies by providing fast operating systems, high-resolution big display screens, large internal storage, and touch screen with zoom function [2]. In addition, customized apps can be installed into a smartphone so that learners can access the content anytime, anywhere without having to wait for SMS.

Technology acceptance models predict how users come to accept and use a technology [7]. Many technology acceptance theories have been developed to explain the users' acceptance of the technology. The most widely used models are UTAUT proposed by Venkatesh *et al.*, [28] and TAM developed by Davis [7]. Although technology acceptance models are widely used to explain users' acceptance of technology, its application to MAELL has not received much attention. Venkatesh *et al.*, [28] encouraged others to validate and test their models in various contexts. They also suggested that future research is needed on the acceptance and use of m-learning, with a focus on technology acceptance models. Therefore, this study employed UTAUT model as a theoretical framework and partially adopted a variable from TAM model in order to investigate students' acceptance of smartphone apps for English language learning (MAELL). The UTAUT model was amended to suit the context of MAELL.

3. Adoption Theories

3.1 Technology Acceptance Model (TAM)

With the dramatic advancement in information technology (IT), understanding how individuals adopt technology is a crucial requirement for a successful implementation of a new system such as m-learning. Thus, many researchers have focused on how individuals accept new technology and what factors influence their adoption [28].

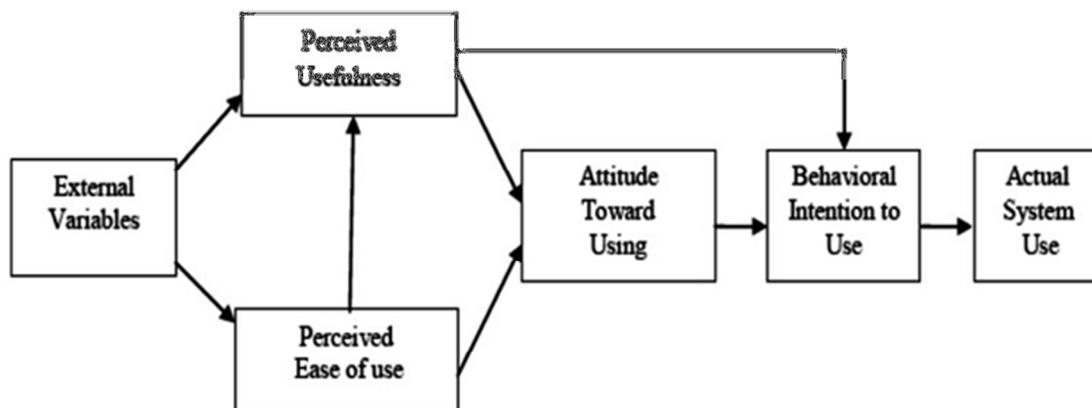


Fig. 1. How individual adopt technology

3.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh *et al.*, [28] conducted an empirical study which compared eight previous major technology acceptance models and proposed a unified model, Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT is the most recent theory which explains users' technology acceptance process. The UTAUT contains four key determinants of users' intention to use and actual use: performance expectancy, effort expectancy, Social Influence, and facilitating conditions.

In addition, four moderators, such as gender, age, experience, and voluntariness of use, are included to explain users' individual differences on their technology acceptance [29].

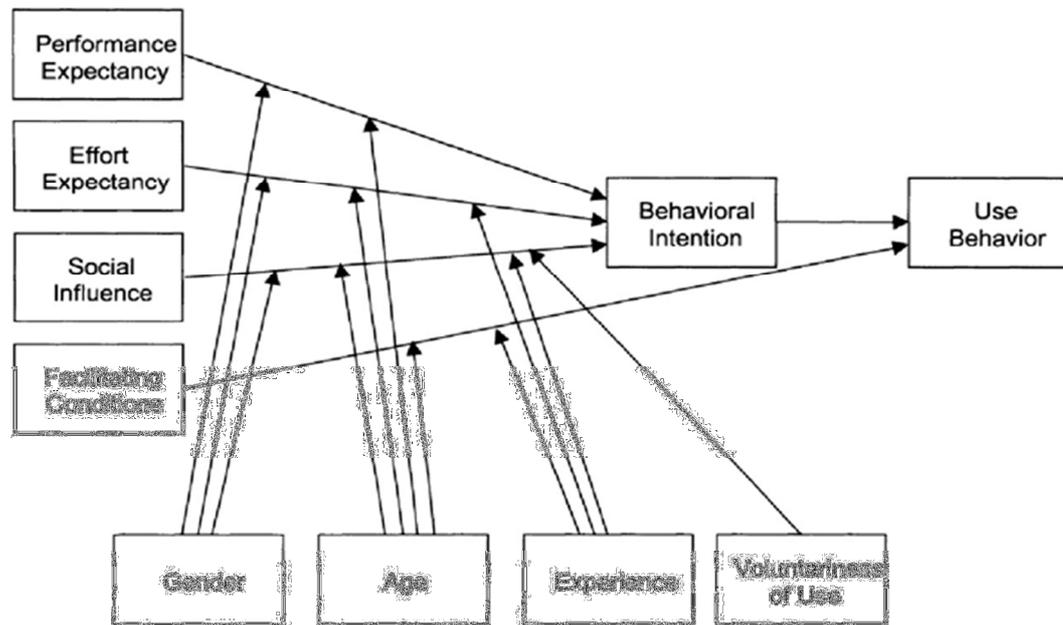


Fig. 2. Performance expectancy

Performance expectancy. According to the definition by Venkatesh *et al.*, [28], performance expectancy is defined as “the degree to which individuals believe that using the system will help him or her to attain gains in job performance”. In m-learning context, learners are more likely to use mobile apps if they expect m-learning to enhance their learning performance or grades [12-16]. Thus, m-learning providers and developers should design the m-learning to better meet learners' performance expectations. In addition, the content of m-learning should be compatible with a variety of mobile devices [4].

Performance expectancy is related to users' perceived system quality and perceived content quality, which are significant factors that determine satisfaction with m-learning. Thus, users' perception towards system quality and content quality positively influence performance expectancy, because they are consumers of technology [1-3].

Effort expectancy. Effort expectancy is defined as “the degree of ease associated with the use of the system” [28]. For instance, learners are more likely to use mobile apps if using m-learning is easy and effortless [16]. In m-learning context, if m-learning is too complicated to use or requires much effort, learners will be discouraged to adopt it [4]. The effect of effort expectancy will be strong during the early stage of m-learning and decrease over time as learners become more familiar and experienced with the system [10]. Therefore, the ease of use is not a big issue for students to adopt mobile devices in their learning [31].

Social Influence. Social Influence is defined as “the degree to which an individual perceives that important others believe that he or she should use the new system” [28]. Thus, Social Influence is user's perception that is engaged in response to recognition of other people. In the context of m-learning, teachers, peers, and parents would be social factors influencing learners' intention to use m-learning [24]. In Malaysia, university students are extremely exposed to IT in every field to catch up with social trends. Thus, they are afraid of falling behind if they do not adopt m-learning.

Therefore, peer and lecturer's influence is more significant to student's intention to use m-learning in the educational environment [1].

Facilitating conditions. Facilitating conditions are defined as "the degree to which an individual believes that organizational and technical infrastructures exist to support the use of the system". In m-learning context, learners are less likely to use mobile apps if they need to acquire new devices, Internet connection, or new knowledge. On the other hand, the likelihood increases in the presence of supporters who can help them with the use of m-learning.

Moderating variables. The UTAUT also includes the moderating variables (gender, age, experience and voluntaries of use) which are essential for understanding the characteristics of various user groups and demographics on the technology acceptance. According to the theory Venkatesh *et al.*, [28], gender and age differences moderate the impact of performance expectancy, effort expectancy and Social Influence on intention to use technology.

Performance expectancy had a higher influence on intentions to use IT for men, especially young men, than for women. Wang and Shih [30] suggested that men may have higher achievement motivation than women, which might have caused the gender difference. On the other hand, the effect of effort expectancy on intention to use technology is stronger for women, especially for those who are older and have little experience in technology, than men, there was a significant gender effect on the relationship between effort expectancy and continuance intention of the mobile app. Women were more likely to prefer the ease of use for continuance intention of mobile apps, which is consistent with the previous work.

Social Influence affected user's intention to use technology more saliently for women than for men. Women are more likely to be aware of others' opinion, and therefore Social Influence is more prominent in women when they made a decision to use IT. Wang *et al.*, [32] also investigated if there was any gender difference in adoption of m-learning. There was a significant gender difference in the effect of Social Influence and self-management learning on learners' intention to use m-learning. The effect of Social Influence on intention to use m-learning was significant for men, but not for women, which is in contrast with the work of Venkatesh *et al.*, [28]. Wang *et al.*, [32] noted that the result was due to women's unfamiliarity with m-learning technology, which made them less influenced by their peers and others in the early stage of m-learning. In addition, self-management of learning was a strong factor for intention to accept m-learning for women than men. As more women have joined the workforce in Taiwan, women have enhanced their capabilities through self-management of learning.

The UTAUT model explained about 70 percent of the variance on intention to use IT and about 70 percent of the variance in technology use. Therefore, it provides a fundamental foundation for future studies and has been applied to a variety of technologies in different contexts [29].

4. Method

4.1 Research Model

This study is designed as quantitative research. For quantitative research, a questionnaire was used to collect information like student's demographic information and their acceptance of MAELL. The data were collected by a Likert scale questionnaire. The statements of the questionnaire were developed based on the MALL theory and two technology acceptance theories: Unified Theory of Acceptance and Use of Technology (UTAUT) model proposed by Venkatesh *et al.*, [28] and Technology Acceptance Model (TAM) proposed by Davis [6]. Collected data were analyzed by the Analysis of Moment Structures (AMOS) and Statistical Package for the Social Sciences (SPSS) systems. Confirmatory factor analysis using AMOS 22.0 was conducted to assess the measurement

model in terms of goodness-of-fit, reliability, convergent validity, and discriminant validity. SPSS was used for descriptive statistics, multiple linear regression analysis.

4.2 Hypotheses

H1: Performance Expectancy positively effect on students intention to use MAELL

H2: Effort Expectancy positively effect on students intention to use MAELL

H3: Social Influence positively effect on students intention to use MAELL

H4: Facilitating Conditions of English E-learning websites positively effect on students intention to use MAELL

H^o : Moderating effect of gender and major among independent variables and dependent variable.

4.3 Procedures

Before the survey was conducted, the questionnaire was revised based on the feedback from professors and peer students to assess its content validity. The questionnaire was sent personally in UUM. The students were given the questionnaire before or after class. All participants were guaranteed confidentiality. Six hundred seventy-five questionnaires were collected from the survey.

4.4 Participants

Participants in this study consisted of 67^o UUM students from two schools, in CAS, UUM. They were undergraduate students aged from 20 to 28. Among them, females were ^o 12 and males were 163. The participants were divided two different academic majors to investigate the effect of academic major as a moderator: English-related majors and non-English majors. English-related majors were 348, and non-English majors were 326. Since the purpose of this study is to identify students' usage patterns of and desire to use MAELL, the prerequisite was smartphone ownership. The respondents who did not own a smartphone were excluded from this study.

4.5 Instrument

In this study, data were collected by a questionnaire. The questionnaire was designed by the researcher to investigate students' acceptance of MAELL and their usage patterns. The questionnaire was developed based on the previous scholarly literature in this field. The survey consists of ^o 0 questions including Yes / No, multiple choice and Likert scale (^o =strongly agree, 1=strongly disagree) questions. The questions were developed based on the validated questionnaires from previous studies and modified for the purpose of this research. In addition, the questionnaire was evaluated by class professors and peer students in order to assess its content validity.

4.6 Analysis

Data were collected from the survey, and SPSS and AMOS systems were used for data analysis. Descriptive statistics were used to analyze usage patterns of MAELL and students' perceptions towards MAELL. In order to assess the measurement, confirmatory factor analysis was used in terms of reliability, convergent validity, and discriminant validity. Multiple linear regression analysis

using SPSS was carried out to examine the relationship between four independent variables and a dependent variable (students' intention to use MAELL).

5. Results

5.1 Descriptive Statistics

Demographic characteristics. Six hundred seventy-five University students participated in the study. Descriptive statistics for the participants' demographic information are listed in Table 1. Males comprised 163 (24.1%) of the participants, while females predominated, with 112 (77.9%). The majority of the students were between the ages of 20 and 29 (89.0%). The rest were aged between 18-19 (3.3%), 26-30 (6.8%), and 30 and above (0.9%). The participants were categorized into two groups: English-related majors and non- English majors. English-related majors were 348 (51.6%), and non-English majors were 327 (48.4%). With regard to the ownership of a smartphone, almost every student (99.0%) owned a smartphone.

Table1
 Participant Demographics

	Category	Number	Percentage
Age	18-19	22	3.3
	20-29	601	89.0
	26-30	46	6.8
	Over 30	6	0.9
Sex	Men	163	24.1
	Women	112	77.9
Major	English-related majors	348	51.6
	Non-English majors	327	48.4

5.2 Correlation

The relationship between PE and intentions to use had the highest correlation coefficient $r = 0.673$ ($p < 0.001$) while the relationship between SI and intentions to use had the lowest as $r = 0.439$ ($p < 0.001$). Significant relationship were found between SL and intention to use as $r = 0.644$ ($p < 0.001$). Correlation values between EE and intentions to use was calculated as $r = 0.633$ ($p < 0.001$) and between FC and intentions to use was $r = 0.600$ ($p < 0.001$). All independent variables showed significant correlations with the dependent variable at a significance of 0.001. In addition, two predictor variables, Performance Expectancy and Effort Expectancy, showed a large positive correlation as $r = 0.606$ ($p < 0.001$).

The results of multiple linear regression analysis are presented in Table 2. It showed that p-values of the five independent variables were less than 0.05. The b value indicates the relationship between predictors and the outcome. If the value is positive, there is a positive relationship between the predictor and the outcome whereas a negative coefficient represents a negative relationship. The standardized beta values (β) provide a better insight to determine which independent variables have the most significant influence on the dependent variable.

Table 2
 Correlations Matrix between Constructs

	PE	EE	SI	FC	SL	IU
Perceived Expectancy (PE)	1					
Effort Expectancy (EE)	.606***	1				
Social Influence (SI)	.437***	.229***	1			
Facilitating Conditions (FC)	.64***	.372***	.32***	1		
Self-management of learning (SL)	.94***	.40***	.392***	.73***	1	
Intention to use (IU)	.673***	.00***	.439***	.633***	.644***	1

*p<.05, ** p<.01, *** p<.001

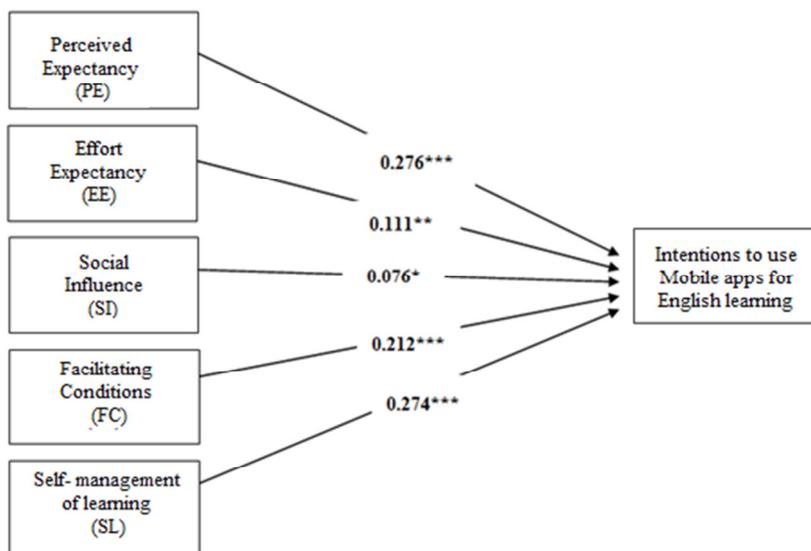


Fig. 3. Standardized Regression Coefficients for All Respondents*p

As Figure 3 demonstrates, all the independent variables (PE, EE, SI, FC, and SL) had a significant positive effect on the dependent variable (intention to use). PE was the most powerful factor in determining intention to use, with a coefficient $\beta = 0.276$ ($p < 0.001$). SL was the second strongest determinant of intention to use with a coefficient $\beta = 0.274$ ($p < 0.001$). Furthermore, PE ($\beta = 0.212$, $p < 0.001$) and EE ($\beta = 0.111$, $p < 0.001$) were significantly influenced intention to use, respectively. Finally, SI ($\beta = 0.076$, $p = 0.013$) exhibited a positive influence on intention to use, but it was the weakest predictor. Thus, all five independent variables positively and statistically influenced the dependent variable.

On the other hand, for the non-English majors, the results of regression indicated that the predictors accounted for approximately 47% of the variance in intention to use and significantly predicted the outcome variable ($R^2 = 0.47$, $F(5, 306) = 73.934$, $p < 0.001$). As shown in Figure 4, PE,

PE, and SL significantly affected intention to use, while EE and SI did not have any significant influence. PE was found to be the strongest predictor of intention to use with a coefficient $\beta = 0.302$ ($p < 0.001$). Furthermore, SL positively affected intention to use, with a coefficient $\beta = 0.278$ ($p < 0.001$). The effect of PE on intention to use was also significant, with a coefficient $\beta = 0.248$ ($p < 0.001$).

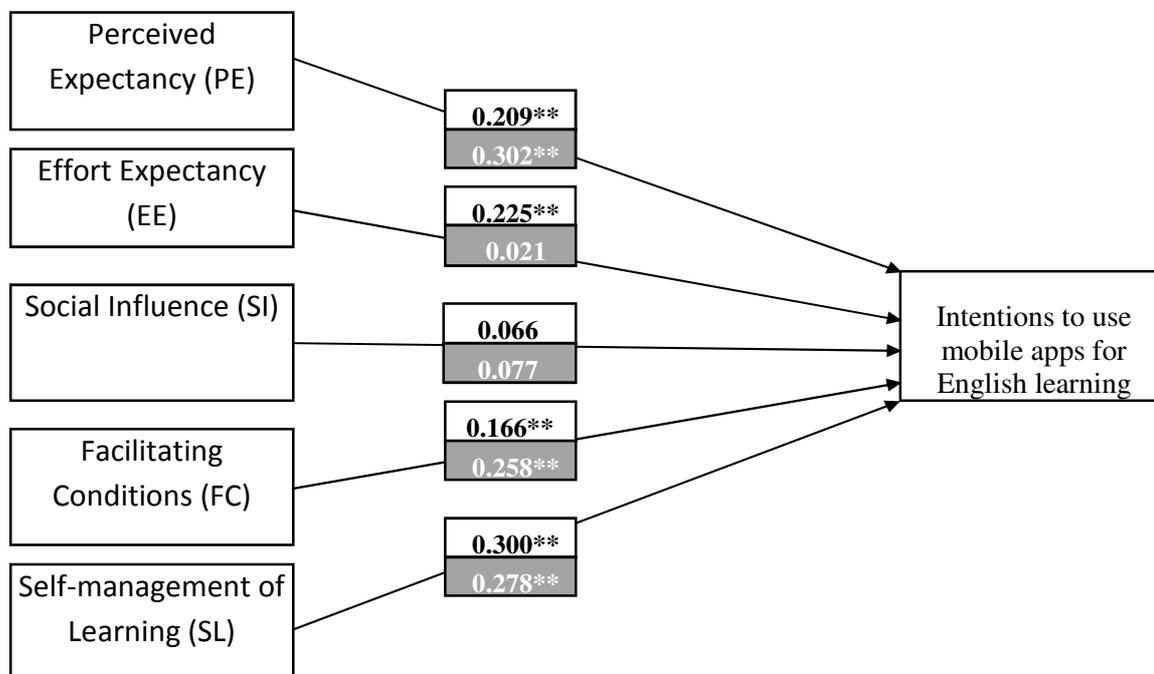


Fig. 4. Regression analysis on intention to use mobile apps for English learning

6. Discussion

Consistent with the findings of Wang *et al.*, [32], the results indicated all the independent variables, including Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and self-management of learning (SL), had significant positive effects on the dependent variable, students' intention to use MAELL.

Performance Expectancy (PE). PE was found to be the strongest predictor of the students' intention to use MAELL. This result is consistent with findings from previous studies, where performance expectancy, a concept similar to "Performance Expectancy" in this study, was the strongest variable that impacts users' intentions to accept m-learning technology. In addition, many researchers applying TAM model revealed that PE is a significant factor in determining acceptance of m-learning technology. In the survey, PE addressed productivity and usefulness of MAELL, effectiveness of MAELL, content quality, as well as interaction and collaboration with peers. Therefore, it is believed that a student with high PE is more likely to accept MAELL than a student with lower PE. PE is highly related to how students perceive system and content quality of m-learning, which are both significant factors that determine users' satisfaction with m-learning. Thus, students' PE may be increased by focusing on the system and content quality of apps. In other words, if the usefulness and benefits of MAELL can be demonstrated, the acceptance of MAELL would likely increase.

Self-management of learning (SL). SL was the second strongest determinant of the students' intention to use MAELL. Its significance was also demonstrated in the findings of Hashim *et al.*, [9]. In the present survey, SL addressed self-discipline, self-management of learning, individualized

learning, and autonomous learning ability. The results suggest that a student with a highly self-disciplined and autonomous learning ability is more likely to use MAELL than a student with a lower self-disciplined and autonomous learning ability. In m-learning context, learners' SL is crucial because they are not directly working with teachers and peers. In addition, successful learning comes from learners' control of learning activity and investigation. The finding in this area supports the notion that smartphone apps could promote autonomous learning, which is in parallel with previous MALL studies. Hence, students should be provided an environment that makes them both autonomous and reflective in their learning. For example, if students can listen to their own pronunciation, intonation, volume, and other phonological features of their speech on a speech recognition app, they may become more reflective and autonomous.

Facilitating Conditions (PE). Consistent with prior research, this study confirmed that PE had a significant effect on intention to use MAELL. In the survey, PE addressed if MAELL is enjoyable, stimulates curiosity, increases motivation, offers multimedia options, and caters to various learning styles. The result of this issue suggests that high level of PE is linked to high levels of intention to use MAELL. Vosloo [30] supported this notion by stating that it is crucial to make learning activities more enjoyable in order to promote learner's intention to use m-learning as the learning process possibly involves a certain degree of pressure. Moreover, English learning activities using apps can be more appealing to students if the information is presented in varied ways through a mixture of different media or use of game playing features to motivate learners. This result in the current study supports Rosell-Aguilar's [22] point of view that students liked app features such as fast access to information, ease of use, game playing elements, and authentic materials. For example, to increase the joy of learning, social media can be integrated into MAELL, which will enable learners to communicate with each other in an authentic environment and to produce their own content. Thus, this activity connects their social life with education, which is supported by previous studies.

Effort Expectancy (EE). The results of this study indicate that EE significantly influenced intention to use. This result is comparable with other previous studies [7]. In the present survey, EE addressed the convenience of downloading content, portability, accessibility, and possible use of dead time for studying. EE is related to the general characteristics of MALL, such as mobility, portability, and accessibility, which establish positive attitudes and perceptions in students toward MALL. In other words, when students perceive that m-learning is easy to use, they consider it convenient to use, and thus useful, which is supported by previous studies. Thus, convenience plays a crucial role in accepting MAELL. Easy-to-use interfaces include such factors as the app being easy to access, download and use, which are key elements of continued intention to use. Many convenient functions of the smartphone system, including touch screen, voice recognition, handwriting recognition, and natural language process, should be available to students. Time efficiency is another convenience offered by apps. As the students were using MAELL to make better use of their dead time, learning should be broken down into smaller units to increase acceptance MAELL.

Social Influence (SI). The results of the current study also showed that SI positively influenced intention to use MAELL, which is consistent with the findings of previous studies. In the present survey, SI addressed the factors of recommendations by teachers and friends and social trends. This means that students will be more likely to use MAELL if their peers and teachers recommend it. This result supports the view that recommendations from teachers, universities, and peers to use m-learning significantly impacts students' decision to accept m-learning, which is in parallel with previous literature.

7. Limitations and Suggestions

In this study, approximately 40% of students who once used MAELL were no longer using it. Thus, future research should examine why former users of MAELL no longer use it in order to better understand their perceptions of MAELL and to devise approaches to maintaining their use of MAELL. Performance Expectancy (PE) was the strongest determinant in this study. Thus, future study can examine PE in more detail. For example, it may investigate what factors could possibly influence PE, including but not limited to: content quality, system quality, and self-efficacy.

This study only included two moderator variables: gender and academic major. Thus, future study can investigate a wider range of moderators, including but not limited to language fluency, m-learning experience, and individual creativity. This study did not include students' actual usage of MAELL in the proposed model. Thus, future study may include actual usage and how that affects the acceptance of MAELL. This study validated UTAUT model in the context of MAELL in Malaysia. Future study may focus on validating the theory in other contexts of technology adoption and identifying more determinants applicable in MALL setting to predicting students' intention to use MAELL. Moreover, future study can expand the current model to other countries as well.

This study only investigated mobile app language learning acceptance on the part of students. The study showed that Social Influence from teachers and peers positively influenced the students' intention to use MAELL. Thus, future study may explore teachers' acceptance of MAELL and their use or willingness to use language learning apps as part of their instruction. A longitudinal study may be conducted to investigate how acceptance of MAELL changes over time. For instance, if a university provides administrative and financial support to its professors for the implementation of MAELL in their classroom, it would be possible to witness how students' technology acceptance and perception change over the course of a semester or longer.

8. Conclusion

This study investigated UUM students' acceptance and use of MAELL based on the UTAUT model. First, this study examined how and to what extent UUM student use MAELL. It confirmed that the smartphone today is an integral part of UUM students' daily lives. Moreover, despite the fact that Malaysian higher education system offers a conducive environment for m-learning, the use of MAELL is still limited in Malaysia. Thus, this study focused on UUM students' usage of MAELL as well as the determinants of students' acceptance of MAELL. Gender moderated the impact of Effort Expectancy and Facilitating Conditions on students' intention to use MAELL. Major moderated the impact of Effort Expectancy, Social Influence, Facilitating Conditions, and self-management of learning on intention to use.

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