

# Acceptance Analysis Of Mobile Learning Using The Unified Theory Of Acceptance And Use Of Technology (UTAUT): The Case Of Asynchronous Learners

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## **Abstract.**

*The purpose of this study is to assess the information technology students' acceptance of and intention to use mobile learning applications using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The study, which involved a first-year through fourth-year and even graduate students from the information technology department, was carried out from January to June 2022. Eighty volunteers participated in the study and completed the self-made questionnaire based on the UTAUT model's five constructs: performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), and behavioral intention (BI). Using the Cronbach's alpha coefficient, the questionnaire's acceptability and reliability were also evaluated. The association between the five factors and the intention to adopt mobile learning was also evaluated using regression analysis. The study's final score of  $\alpha=0.080619$  suggests that the constructed questionnaires were good and acceptable. Four theories were put to the test, and the results indicate a favorable impact on the behavioral intention to utilize mobile learning applications. Future research should reevaluate the UTAUT model among students who are not studying computer technology when an asynchronous style of learning is also relevant.*

**Keywords:** Mobile learning, asynchronous learners, UTAUT model, acceptance analysis and UTAUT.

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## **I. INTRODUCTION**

Asynchronous learners are one way in an educational system that describes learners in the use of prerecorded video lessons, game-based learning tasks, and the aspects of different applications that do not occur in the same place and time. This type of educational system helps most students, especially since they can still find time for any job opportunities. With the rapid growth of mobile phone applications, it brings a slope of change not only in the behavior of education, but also becomes a tool for mobile health, and banking. With the promising benefits of mobile learning, (Stewart, 2019) noted that mobile learning is not always the best solution to a problem. Although the study of (Neelakandan, 2021; Team, 2021) strongly posited that mobile learning is one of the effective techniques in delivering a better learning experience, they also noted challenges like data privacy and security, compatibility of the content, and small screens that caused pain. In this generation, the educational system has paved the acceptance of mobile learning in support of asynchronous learners. Today, people demand more work in order to survive for a living. Younger generations of today also come into reality that they also make a way not only to support themselves but the whole family. However, these younger generations still aim to surpass the challenges of the work and educational systems. The asynchronous learners came to realize that a challenge really exists for teachers who are not present during their active times in reading and understanding the lessons.

The case study of (Corfman & Beck, 2019) enumerated that the project-based prompts, and problem-based prompts were noted as the concerns of the students. Despite the academic concerns enumerated by (Corfman & Beck, 2019), the study of (Perveen, 2016) found that the asynchronous mode of learning is beneficial for second language learners. Indeed, in determining where the students will succeed between the different modes, it is essential to further conduct research and observation to present corresponding benefits and as to where the instructions will make adjustments in terms of using mobile technologies as a tool in delivering instructions. The UTAUT model has been applied to assess the acceptance of e-learning (Mahande & Malago, 2019; Lakho & Pitafi, 2019; Ngampornchai & Adams, 2016)

and the main factors in the contribution are listed as follows: the performance expectancy in the aspect of behavioral intention, the collaborative use of e-learning tools; performance expectations; effort expectancy; and social influence; and the user's experience in the use of application features and such. Everybody in the Academe, aims to provide a quality education for every different mode of learning that a student may choose.

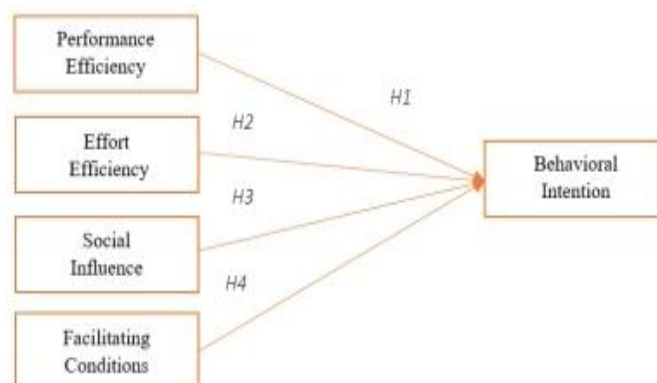
The disappointing factors were always being examined by the decision-making body to improve academic concerns and to support the needs of the stakeholders. In this case, the study wants to apply the UTAUT model to assess the case of asynchronous learners by the objectives of: determining the demographic characteristics of the respondents among the variables of age, gender, voluntariness, experience in technology, and academic level; determine the user's behavioral intention and the behavior of use with the five constructs used by UTAUT like performance expectancy, effort expectancy, social influences, facilitating conditions, and behavioral intention; lastly is to assess the significant level of behavioral intention and behavior of use in the acceptance of mobile learning. The results of the study will be beneficial to the policy makers to determine what aspects they can use to improve the entire educational system.

## II. MATERIALS AND METHOD

### *Research design*

The primary goal of this study is to determine the attractiveness and the rationale for the use of mobile learning techniques by a number of data-area college students based on the research version of the Unified Theory of Acceptance and Use of Technology (UTAUT). The advantage of the model was ascertained by (Williams, Rana, & Dwivedi, 2015) that it could be able to examine the influence of technology over the use of the organization, most especially for those who wanted to make predictions on the impact of technology adoption. This was conducted in the months of January to June 2022, where the graduates of that year were also included as the respondents of the study. This study consists of three phases: extraction of data among the respondents; analysis of the user's behavioral intention and behavior of use of five constructs; and the assessment of the significant level of the behavioral intention and behavior of use in the acceptance of mobile learning. As stated by (Attuguayeflo, Samuel, & Addo, 2014), the constructs can be added or subtracted based on the needs of the study. This is shown in Fig.1 of the study. The five adopted constructs used in the study include (Wijaya, Cao, Weinhandl, Yusron, & Lavicza, 2022):

- *Performance Expectancy (PE)*: The degree to which the people believe that using technology will result in improved performance. This can also be considered because the perceived usefulness of the technology.
- *Effort Expectancy (EE)*: The ease with which the technologies can be used.
- *Social Factors (SI)*: The degree to which individuals believe that significant others believe they should use technology.
- *Facilitating Conditions (FC)*: The perceived extent to which the organizational and technical infrastructure required for technology support exists.
- *Behavioral Intention (BI)*: A person's future intention to adopt and use technology.



**Fig 1.** Proposed research model and hypotheses

### ***Research participants***

The study employs 80 information technology students from first year level to fourth year level. It also included IT graduates who were part of a mobile learning strategy, beginning in 2020, when most schools migrated to the use of technology. The respondents volunteered themselves to answer the self-constructed questionnaire following the five constructs of the Unified Theory of Acceptance and Use Technology (UTAUT) model, namely: performance efficiency (PE); effort expectancy (EE); social influence (SI); facilitating conditions (FC); and behavioral intention (BI). The data was extracted from the filled-in online questionnaires. In answering the questionnaire, it used the Likert scale (with five points) to determine the user's acceptance level. The mobile learning applications were pre-evaluated by the people whose expertise is in using them. Regression analysis was used in this research to measure the correlation between the five primary elements and the intention to utilize mobile learning. The results were used to create a framework that encompassed the capacity to measure the students' eagerness for mobile learning. Also, the validation of the culture parameter with the Unified Theory of Acceptance and Use Technology (UTAUT) was ascertained.

### ***Used variables in the study***

The actual population who answered the online questionnaires was 89 in total, but the study decided to remove the other nine (9) for having incomplete inputs. The number of variables was classified into three categories: moderating variables, independent variables, and dependent variables. Moderating variables for the three types of variables included (4) variables: age, gender, voluntariness, experience in technology, and academic level. It consists of four (4) independent variables, each of which is observed to have the same number of questions. This is shown in Table 1 of the study.

**Table 1.** Variation of the study's variables

Type	Variables	No. of Variables
<b>Moderating variables</b>	Age, Gender, Academic Level	4
<b>Independent Variables</b>	Performance Efficiency (PE)	4
	Effort Expectancy (EE)	4
	Social Influence (SI)	4
	Facilitating Conditions (FC)	4
<b>Dependent Variables</b>	Behavioral Intention (BI)	4

### ***Research hypothesis***

The five constructs of UTAUT are hypothesized to have a significant role as direct determinants of user acceptance and usage behavior.

*Hypotheses1 (H1):* Performance expectancy has a positive effect on behavioral intention.

*Hypotheses2 (H2):* Effort expectancy has a positive effect on behavioral intention.

*Hypotheses3 (H3):* Social influence has a positive effect on behavioral intention.

*Hypotheses4 (H4):* Facilitating conditions has a positive effect on behavioral intention.

*Hypotheses5 (H5):* Behavioral intentions have a positive effect on the four constructs mentioned.

## **III. RESULTS AND DISCUSSION**

### **Results**

#### ***A. Demographic profile of the respondents***

##### *Extracted data*

Table 2 shows the demographic profile of the respondents. The majority of those who have responded belongs to the age range of 21-25, which makes up 71.25% of the total population. It is also noted that there are 13.75% whose age is in the range of more than 30 years of age. The majority of those who responded were female; that is 58.75% of the total population. The questionnaire was deployed among the 1<sup>st</sup> year to 4<sup>th</sup> year levels and was extended to the fresh graduates of 2022, an estimated population of 400 and beyond. However, in this case, 80 participants made it complete. The respondents of the study all belong to the information technology department, and it is expected that they are all already familiar with the technology. In terms of the academic level, the 4<sup>th</sup> year level dominated by the figure, with 41.25%. It was followed by the third year level with 26.25%, the second year with 15%, graduates with 10%, and a little

percentage from the first year level with 7.5%. Despite this, the distribution of data is considered good for everyone, including the graduates, becomes a participant in the study.

**Table 2.** Profile of respondents' demographics

Variables (n=80)	Group f	(%)
<b>Age</b>	≤18	
	18 to 20	
	21-25	57 (71.25%)
	26-30	2 (15%)
	>30	11 (13.75%)
<b>Gender</b>	Male	33 (41.25%)
	Female	47 (58.75%)
<b>Voluntariness</b>	>400	>80
<b>Experience in Technology</b>	>400	>400
<b>Academic Level</b>	1 <sup>st</sup> year	6 (7.5%)
	2 <sup>nd</sup> year	12 (15%)
	3 <sup>rd</sup> year	21 (26.25%)
	4 <sup>th</sup> year	33 (41.25%)
	Graduate	8 (10%)

### **B. Behavioral intention and use of the five constructs**

#### *Data analysis on the acceptance and use of mobile learning scale*

Using SPSS, the internal reliability and construct validity were assessed by computing the Cronbach's alpha coefficient range and arriving at a result  $\alpha=0.080619$ . According to the Likert scale of Cronbach's alpha, a value like  $0.9 > \alpha \geq 0.8$  is good and acceptable. However, the speculation for the unacceptability of alpha values considered the low number of questions, poor inter-relatedness between items, or heterogeneous constructs (Tavakol & Dennick, 2011). In this regard, the assumptions on the said issue considered the computation of the test item correlation to significantly get the most reliable result for questions. This is shown in the study's Table 3.

**Table 3.** Acceptance of data using Cronbach's alpha

	Acceptance Analysis
#items/questions/components	14
Sum of the item variances	21.01
Variance of total scores	22.70484
Cronbach's $\alpha$ 0.	080619

The statistical mean and standard deviation are presented in Table 4 of the study, which helps to understand the degree of perception and acceptance of mobile learning. The results showed that students, with a mean PE value of 2.325, felt that mobile learning applications may help them develop their skills to achieve their job performance. Since everyone thinks that using technology would help them perform better, performance expectancy has been demonstrated by a large body of studies to have a major impact on BIs (Wijaya, Cao, Weinhandl, Yusron, & Lavicza, 2022). The majority of students, with a mean SI of 2.325, also agreed that other people can influence how they utilize mobile learning applications, such as program administrators and others who are aware of the significant positive effects it has on their personal development. The sphere of friends, family, coworkers, and students is considered to be a social influence. Students believed that using mobile learning apps was related to problems with how they functioned, as highlighted in the study. Despite expectations that the respondents, who are all from the information technology department, would regard the system's usability, the mean EE score of 2.075 reduces their degree of confidence.

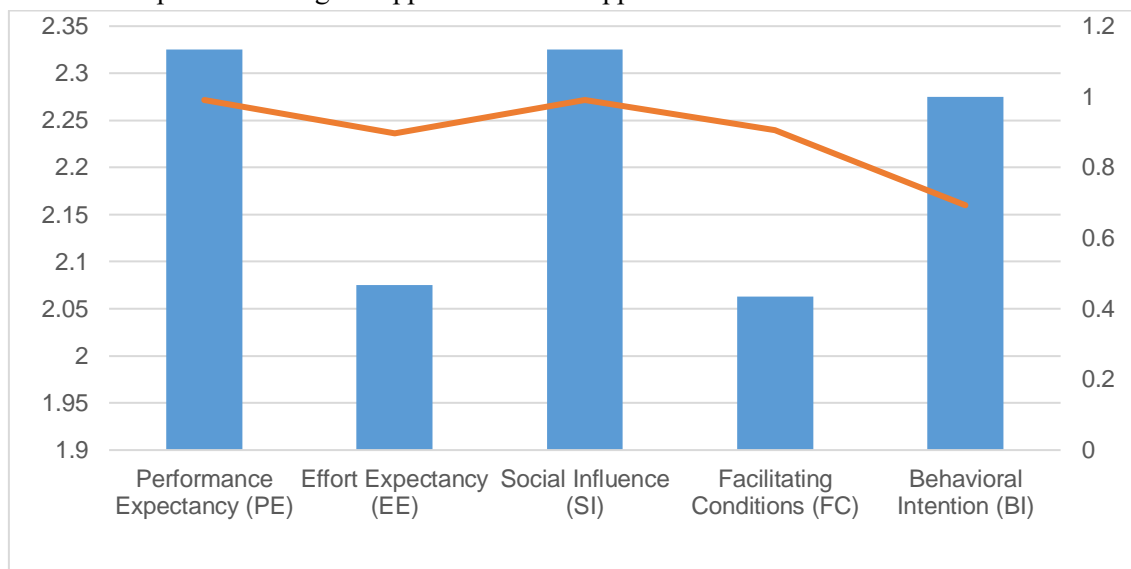
When students are not supported, especially when a variety of technologies are used-some of which are not the organization's own property-this becomes feasible. This agrees with the finding that the BI's mean value is 2.275. This serves as their justification for disabling the recommendation about it for use in further studies of mobile applications. Unfortunately, with a mean score of 2.063, students' feedback on the FC construct is the lowest. Graduates and students alike think they lack the requisite resources to employ mobile learning tools. The study by Thomas, Singh, and Gaffar (2013) claimed that despite the fact that it

had no direct effects on the BIs, it was highly influenced by the construct because it had the lowest mean of 2.063.

**Table 4.** The study’s level of perception and acceptability of mobile learning

N	Constructs	x	S.D.	Remarks
1	Performance expectancy (PE)	2.325	0.991	High
2	Effort Expectancy (EE)	2.075	0.897	Moderate
3	Social influence (SI)	2.325	0.991	High
4	Facilitating conditions (FC)	2.063	0.905	Moderate
5	Behavioral Intention (BI)	2.275	0.693	Moderate

Fig.2 shows the graph displayed in Table 3. Students and graduates believe that mobile learning applications can help them achieve their job performance and other applications can affect their use. Therefore, their behavioral intent to use the app has been revealed in the survey. However, according to the survey, students feel that there is a lack of support in using the system’s technical infrastructure, in which case the “exceeded” point for using the application is not appreciated.



**Fig 2.** Acceptance level of the five constructs

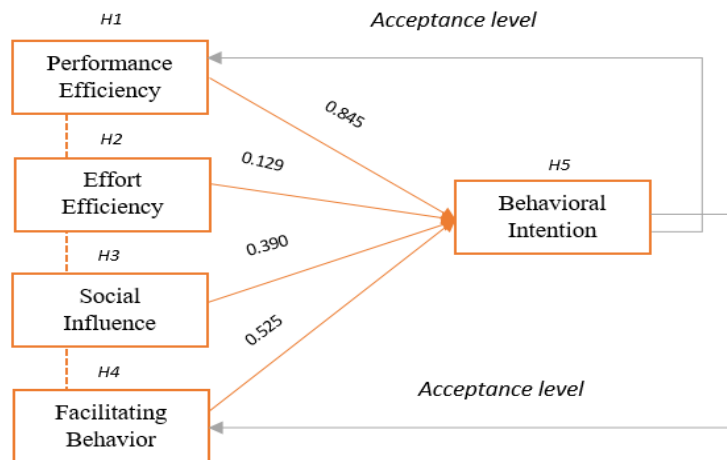
**C. Assessment of significant level**

Overall, the results of the hypothesis test are shown in Table 5. Almost all correlations with behavioral intent are significant, with values above the p-value significant level. This study shows that all four components are positively associated with the intent to use behavior.

**Table 5.** Results of Hypothesis Testing

Hypotheses	Result	Conclusion
<b>H1:</b> PE has a positive effect on BI	Yes: Significant (p-value=0.845) (p<0.05)	with positive effect
<b>H2:</b> EE has a positive effect on BI	Yes: Significant (p-value=0.129) (p<0.05)	with positive effect
<b>H3:</b> SI has a positive effect on behavioral Intention	Yes: Significant (p-value=0.390) (p<0.05)	with positive effect
<b>H4:</b> FC has a positive effect on behavioral Intention	Yes: Significant (p-value=0.525) (p<0.05)	with positive effect

Fig.3 shows the acceptance levels for the five components. The results show that the influence of four components, such as PE, EE, SI, and FB plays an important role in the behavioral intent of students using mobile learning applications (Chao, 2019). Both play an important role in supporting the future use of mobile learning applications.



**Fig 3.** Acceptance level of the five constructs

### Discussion

The good thing about this study is that there are representatives from every year level of information technology students. The study believed that the acceptance analysis of mobile learning was then strengthened with the participation of the graduate students as they are the one who most experience mobile learnings in the year 2019-2021. With the 80 participants, the 4<sup>th</sup> year students participated the most in the conduct of the study and most of them belongs to female to whom the age is found in the age range of 21-25. The Cronbach acceptance of  $\alpha=0.080619$  states that the construct of test questions is good and acceptable. Performance expectation and social influence received the great feedback from the students, receiving the highest grand mean of 2.325 across the constructs of performance expectancy, effort expectancy, social influence, enabling conditions, and behavioral intention. Due to their interest in technology, they continue to believe that using mobile learning at their own as asynchronous learners will help them develop the skills they need to succeed (Onaolapo & Oyewole, 2018).

Additionally, the senior information technology students believe in the significance of this mobile device as a tool for their ongoing learning, according to the construct of social influence that deals with people's ideas, behaviors, and attitudes. Nevertheless, the research of (Lin, 2019) questioned if social influence had a major impact on the use of a user's intention. The research maintains that social influence can still have an impact on a user's decision to forego using certain technologies, as this was also demonstrated in the study of (Momani, 2020). As a result of their hypothesis being over the p-value significant level, the study determined that practically all of the associated constructs are significant. The survey's result can be used as a first indicator of how well-liked mobile learning applications are among asynchronous learners. Despite the fact that the survey's participants haven't yet reached half of the student body, this research implies that the UTAUT model is widely used. The studies that showed a beneficial impact on behavioral intent in mobile learning applications supported the four hypotheses. In this instance, the school administration will prioritize the policy and make effective use of the technology by setting peaks for two study-identified components, in particular the expected value of effort (EE) and the promotion of conditions (FC). Future research of non-information technology students who also use asynchronous learning modes need to reevaluate the UTAUT paradigm.

### IV. CONCLUSIONS

The survey's respondents were among 80 willing students from the Information Technology Department, according to a thorough investigation of mobile learning acceptance that supports the claim that asynchronous learners can use mobile learning applications utilizing the UTAUT paradigm. Fortunately,

there were a variety of levels of participants, including 2022 grads. Female participants made up 58.75% of the total, compared to men (41.25%). Students and recent graduates thought that the applications could be able to help them achieve their objective of job performance, and that other people might have an impact on how mobile applications are used. Their behavioral intention to use applications is therefore demonstrated in the study. However, the survey discovered that the students felt unsupported when using the system's technological infrastructure, and in that situation, the "hereafter" for using the program was not offered with glowing recommendations. Additionally, all correlations with behavioral intent are significant beyond the p-level values of significance, indicating a positive link between the four components and behavioral intent.

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