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Are we Ready for Mobile Learning?: Validation Of Utaut Model

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ABSTRACT

Mobile technology is among the many commonly used technology for education and learning. It also both conversational technology and constructivist learning tool. Its interactive, collaborative and user-friendly features have transformed mobile technology into an effective tool for enhancing case-based teaching methods in the asynchronous nature of the online environment. This paper focuses on the investigation into the Diploma Applied Science students' acceptance level towards the incorporation of mobile learning (mLearning) in their formal English Language course. This study investigated the student populace's acceptance of the mobile technology through the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. The survey questionnaires was designed based on UTAUT model to seek elaborative findings and was conducted on 100 Applied Science students of a Malaysian public university who were undergoing an English Language course. The findings indicated that the overall result on all the key constructs (based on UTAUT model) concluded that the students highly accepted mLearning as an intervention in facilitating their learning needs and they intended to use it. These findings justified the incorporation of mLearning as learning support to the students' language learning needs to improve their language competence and for the successful implementation of a learning solution.

Keywords : Mobile learning, (mlearning), Mobile Technology, Unified Theory of Acceptance and Use of Technology, (UTAUT), students acceptance

Introduction

Advances in mobile technologies have enabled educators to send instructional messages in flexible ways. With new technologies, including mobile computers, Pocket PCs, Apple iPhones, Android phones, and tablets, instructors and students can communicate through voice and image as well as text. Using mobile devices for educational purposes is becoming a common expectation of learners (Lan & Huang, 2012). For instance, Valk, Rashid, and Elder (2010) demonstrated how mobile phone-facilitated learning can give students in developing countries increased access to educational materials and services, particularly in rural and remote regions. In some previous studies on small displays (e.g., Chen et al., 2003; Maniar, Bennett, Hand, & Allan, 2008), small screen size was found to create cognitive disadvantages related to students' attention and visual perception (Kim & Kim, 2012). However, students have also reported wanting to have more options to make learning tools more convenient so

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they can study when and where they want to. Typically, the use of personal devices affords students' ownership of learning, which may Daesang Kim, Daniel Rueckert, Dong-Joong Kim, and Daeryong Seo lead to positive language learning experiences (Kukulska-Hulme, 2009).

However, the success of new technology introductions cannot be achieved if the students do not accept and use the technology. Technology acceptance is an active area of research where several models and theories have been proposed to understand the drivers of technology adoption. One of the most prominent models is the Unified Theory of Acceptance and Use of Technology (UTAUT).

Literature Review

UTAUT has been tested in several cultures and organizational contexts. Research on cross cultural validation of UTAUT includes a study on employees' acceptance and use of computers in Saudi (Al-Gahtani, Hubona, & Wang, 2007), Educational technology acceptance in Turkey (Göğüş, & Nistor, 2012), MP3 player and Internet banking in Korea (Im, Hong, & Kang, 2011), among others. Mixed support for the original UTAUT theory was found when UTAUT was applied in other cultural contexts which led some researchers to argue that UTAUT should be extended to include cultural constructs alongside the current constructs. Besides being tested in several cultures, UTAUT has also been tested in several organizational contexts, including health care organizations (e.g., Venkatesh, Sykes, & Zhang, 2011; Ifinedo, 2012), business organizations (e.g., Anderson & Schwager, 2004), government organizations (e.g., Zhan, Wang, & Xia, 2011), and Educational institutions (e.g., Birsch & Irvine 2009). There has been some research suggesting adding context specific constructs to UTAUT. For example, Vekatesh et al's (2012) paper on consumer acceptance and use of information technology suggests adding three constructs to UTAUT: hedonic motivation, price value, and habit, for the context of consumer technology use. Similarly, Sun, Bhattacharjee, and Ma (2009) suggested adding IT's perceived work compatibility to "fit the context of organizational work". However, there are still many contexts where the need for additional constructs in UTAUT has to be explored. This research focuses on students' acceptance and use of technology in their academic institutions in an attempt to compare the results with the original UTAUT findings and explore whether context specific constructs should be added to UTAUT, specifically, constructs related to students and the academic environment. Literature on technology in education have studied the effect of faculty and peer encouragement (Martins & Kellermanns, 2004), availability of technology (Chung, 2002), TOE (technological, organizational and environmental) factors (Mills, 2008), educational compatibility (Chen, 2011), among others on the acceptance, diffusion, use, or effectiveness of technology in higher-education institutions. These educational context specific constructs are not measured in the original UTAUT, which raises a question of whether UTAUT alone can be effectively used in a higher-education context to predict students' acceptance and use of technology.

Previous studies using UTAUT as a model to evaluate the user acceptance and use of technology in an educational institution, specifically higher-education institutions, have several purposes and methodological differences leading to different conclusions about the applicability of UTAUT in higher-education institutions. Of the studies that survey students in higher-education institutions, some studies test technologies that are not related to the academic environment. For example, Al- Awadhi and Morris (2008) surveyed university students about e-government services and reported that the findings are "consistent to some extent" (p. 9) with other similar studies, but indicating that using a sample of students might have caused some of the contradictions in results. Lin, Chan and Jin (2004) surveyed university students about instant messaging using a modified version of UTAUT. She

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reported that not all the results were consistent with the originating UTAUT study because the study was in a different environment. Although these studies use students as participants, they do not answer the question of whether the original UTAUT model is applicable in an educational setting. This research study is focused on technologies used by the students in courses for academic purposes.

The Second observation from the literature review related to the use of UTAUT in an educational environment is that some studies, survey students on technologies that are not newly introduced to them. For example, a study on educational technology acceptance using UTAUT (Gogus & Nistor, 2012) studied “the computer as a learning tool, with specific references to office software, information search on the internet, communication and interaction between internet users” (p. 398) which also includes email, discussion forums and chat. Another study by Marchewka, Liu and Kostiwa (2007) studied “students’ perceptions of using Blackboard®” (p. 103) when the students were already familiar with that technology and had been using it prior to the study. The authors reported that “the study did not find strong support for the UTAUT model” (p. 103). Despite the interesting findings and questions these studies provide, they do not follow the same methodology as the original UTAUT study with regards to the timing of the survey.

Research that studies a technology familiar to the students, contrary to the original UTAUT study, are not longitudinal studies that evaluate user acceptance over time; rather, they capture the users’ perception at one point only, well after the users’ acceptance or rejection decision. The original UTAUT study focuses on user acceptance of technologies that are newly introduced to capture the user’s first perception and how that perception changes with increased experience of using the technology. Consistent with the original UTAUT model, this study is examining new technologies that are introduced to the students and measures their first impression about it at the time of the training, and how their perception and adoption decision change over time.

Model of Acceptance as a Theoretical Framework

In their review of the eight prominent IT acceptance and motivation models, the authors of UTAUT found seven constructs to be significant direct determinants of acceptance and use of technology in one or more of the individual models. However, they found that three of these constructs (self-efficacy, anxiety, and attitude) do not have any direct effect on intention to use the technology, therefore, these constructs were dropped from UTAUT while the other four (performance expectancy, effort expectancy, social influence, and facilitating conditions) were kept. This study measures the seven original constructs to compare their influence on acceptance with the findings of UTAUT. Table 1 shows the definition of each of the aforementioned constructs as reported in the originating UTAUT study (Venkatesh et al., 2003).

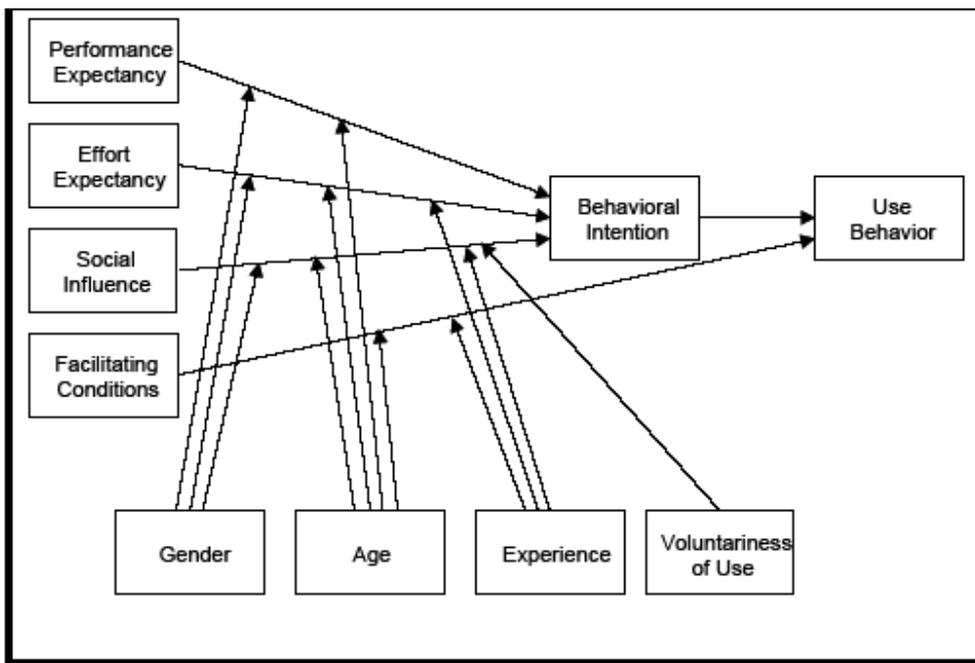


Figure 1: UTAUT Model

Performance Expectancy (PE). The degree to which an individual believes that using the system will help him or her to attain gains in job performance.

Effort Expectancy (EE). The degree of ease associated with the use of the system.

Social Influence (SI). The degree to which an individual perceives that important others believe he or she should use the new system.

Facilitating Conditions (FC). The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

Behavioural Intention (BI). The person's subjective probability that he or she will perform the behavior in question

UTAUT- Unified Theory of Acceptance and Use of Technology

Research Question

To what extent the Diploma Applied Science students' acceptance level towards the incorporation of mobile learning (mLearning) in their formal English Language course.

Methodology

This study was conducted at University Technology MARA, Tapah, Perak as a pilot study. One hundred questionnaires were administered and collected, containing 23 UTAUT survey questions and 9 demographic statements totaling 32 questions. The study shows that, 36% were male and 64% were female. The expectations are that the survey will provide evidence of the acceptance and use of mobile learning by the university students. The respondents are the Diploma Applied Science students. The survey tool presented modified questions based on UTAUT model.

In order to respond to the research question, the UTAUT model was used. The UTAUT model theorizes that four constructs have a significant determination on user acceptance of IT

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innovations (David, 1986; Venkatesh et al., 2003) as seen in Figure 1. By using SPSS version 19, the following results were derived:

Table 1(a)
Reliability Case Processing Summary

Cases	N	%
Valid	100	100.0
Excluded ^a	0	.0
Total	100	100.0

a. Listwise deletion based on all variables in the procedure.

Table 1(b)
Reliability Statistics

Cronbach's Alpha	N of Items
.786	23

Table 1(a) contains the measures of scale reliabilities for the constructs. Generally reliability numbers greater than 0.6 are considered acceptable in technology acceptance literature. (David, 1986; Zhang, Li, & Sun, 2006). As summarized in the Table 1(b), a reliability analysis was conducted, for the 23 items using Cronbach’s Alpha. The UTAUT constructs appears to have a good degree of reliability of above .70.

Results and Discussions Descriptive Analysis

A Descriptive statistical analysis described in this section in order to provide a broad understanding of the students’ view of mobile learning acceptance and use for teaching and learning. Participants were asked to rate their level of agreement with each statement or Question with appropriate responses on a five item Likert scale. Where (1) is “Strongly Disagree”, (2) is “Disagree” (3) is “Neither Agree nor Disagree”, (4) is “Agree”, and (5) is “Strongly Agree”.

Table 1
Performance Expectancy

	(N= 100)				
	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Performance Expectancy	1	2	3	4	5
Q1 (PE1) I would find mobile learning useful in my learning.	0.0% (0)	0.0% (0)	10% (10)	49% (49)	42% (42)
Q2 (PE2) Using mobile learning enables me to accomplish learning	0.0% (0)	0.0% (0)	3% (3)	73% (73)	24% (24)

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activities more quickly.					
Q3 (PE3) Using mobile learning increases my learning productivity.	0.0% (0)	0.0% (0)	21% (21)	50% (50)	30% (30)
Q4 (PE4) If I use mobile learning, I will increase my chances of getting a better grade.	0.0% (0)	0.3% (3)	18% (18)	48% (48)	30% (30)

Performance expectancy had a mean response of 4.32 and standard deviation of .665 for (PE1). The construct was significantly correlated with Behavioral Intention (BI) at the 0.05 level (2tailed). Responses to performance expectancy questions (Q1-Q4) are related to the extent an individual believes mobile technology helps them to accomplish their learning activities. The overall results of these series of questions associated to the perceived usefulness of mobile technology to the university students were positive. This implies that learning using mobile technology makes the task more easily accomplished, thereby making them more productive. The result of the survey shows that 86.5% agree. Hence this determines the level of expected adoption of mobile technology by the respondents. Among the four UTAUT constructs, performance expectancy exerted the strongest effect. Therefore, Performance expectancy is the most influential factor for the acceptance and use of mobile technology by the respondents. Based on questions Q1, Q2, and Q3, it showed that nobody disagree with the usefulness of mobile technology, thus the disagree rate is 0%. Hence, responses to Q4 have 78% agreeing and believing that using mobile technology in their studies would increase their chance of getting good grades.

Table 2
Effort Expectancy

Effort Expectancy	1	2	3	4	5
Q5 (EE1) My interaction with mobile learning would be clear and understandable.	0.0% (0)	0.0% (0)	20% (20)	70% (70)	10% (10)
Q6 (EE2) It would be easy for me to become skillful at using mobile learning.	0.0% (0)	0.0% (0)	4% (4)	86% (86)	10% (10)
Q7 (EE3) I would find mobile learning easy to use.	0.0% (0)	0.0% (0)	28% (28)	66% (66)	6% (6)
Q8 (EE4) Learning to operate mobile learning is easy for me.	0.0% (0)	0.0% (0)	11% (11)	84% (84)	5% (5)

(N= 100)

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Effort expectancy construct had a mean response of 3.87 and standard deviation of .562. EE was significantly correlated with BI at the 0.01 level (2-tailed). Responses to effort expectancy questions (Q5-Q8) are related to how easy an individual believes the mobile technology is to use. Overall results for this series of questions were perceived as being positive with individual ability to easily use and understand the mobile technology, which are always user friendly. The result shows that, 84.3% agreed that they could use mobile technology. EE has the highest correlation with BI, all the constructs were significantly correlated with BI but the strongest correlation was Q6 (EE2), which states that : ‘It would be easy for me to become skillful at using mobile learning.’

Table 3
Social Influences

Social Influences	1	2	3	4	5
Q9 (SI1) People who influence my behavior will think that I should use mobile learning.	0.0% (0)	3% (3)	83% (83)	6% (6)	8% (8)
Q10 (SI2) People who are important to me will think that I should use mobile learning.	0.0% (0)	3% (3)	55% (55)	41% (41)	1% (1)
Q11 (SI3) The lecturers' have been helpful in the use of mobile learning.	0.0% (0)	4% (4)	10% (10)	65% (65)	21% (21)
Q12 (SI4) In general, my institution has supported the use of mobile learning.	0.0% (0)	2 % (2)	12% (12)	64% (64)	22% (22)

Social Influence had a mean of 3.03 and a standard deviation of .300. This construct was significantly correlated with BI with a correlation coefficient of .096. Responses to social influence questions (Q9-Q12) are related to whether or not important others' influence an individual's intention to use mobile technology. Overall results for this series of questions were perceived as being slightly positive with regard to personal and institutional support, and other's influence on their mobile technology use. Correspondingly, 57% agreed with these sentiments and 3% disagreeing with 40% neither agreeing nor disagreeing. In general, academicians would support the use of technology for teaching and learning. Q11 (SI3) had an over whelming positive response with 86%of the respondents “agree” or “strongly agree”.

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Table 4
Facilitating Conditions

(N= 100)

Facilitating Conditions	1	2	3	4	5
Q13 (FC1) I have the resources necessary to use mobile learning	0.0% (0)	8% (3)	12% (83)	80% (80)	0% (0)
Q14(FC2) I have the knowledge necessary to use mobile learning	0.0% (0)	0.0% (0)	8% (8)	90% (90)	2% (2)
Q15(FC3) The technology did not match the mobile technology I operate	0.0% (0)	80% (80)	16% (16)	4% (4)	0.0% (0)
Q16(FC4) A specific person or group is available for assistance with mobile learning difficulties.	8% (8)	5% (5)	35% (35)	52% (52)	0.0% (0)
Q17 (FC5) I could finish the work of mobile learning ... when nobody is available to assist.	0.0% (0)	8% (8)	92% (92)	0.0% (0)	0.0% (0)
Q18(FC6) I could complete the job or task using the mobile technology ...if I could call someone for help if I got stuck	0.0% (0)	0.0% (0)	14% (14)	58% (58)	28% (28)
Q19 (FC7) I can finish the work with mobile technology if I have enough time.	0.0% (0)	0.0% (0)	9% (9)	56% (56)	35% (35)
Q20 (FC8) I could complete the job or task using the ICT ...if I had just built-in help facility for assistance	0.0% (0)	0.0% (0)	34% (34)	60% (60)	6% (6)

Facilitating Condition had a mean of 3.75 and standard deviation of .592. FC was significantly correlated with BI at the 0.05 level (2-tailed). Responses to facilitating condition questions (Q13-Q20) asks if individual's have the personal knowledge and institutional resources available to use mobile learning. Overall results for this series of questions were perceived as being slightly positive with respondents stating that they possess the knowledge to use mobile learning and that their institution's have a support structure available to users, should they need assistance. There was one exception regarding the negative wording of Q15 that will require reverse scoring for this item to get a true indication of the responses. As a result 58.9% agree with these sentiments and 13.5% disagree while 27.5% neither agreeing nor disagreeing. Q17(FC5) had a negative result, probably the question need to be reframe to be clearly understood.

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Table 5
Behavioral Intention

(N= 100)

Behavioral Intention	1	2	3	4	5
Q21 (BI1) I intend to use mobile learning in the next 12 months.	0.0% (0)	0.0% (0)	67% (67)	33% (33)	0.0% (0)
Q22(BI2) I predict I would use mobile learning in the next 12 months.	0.0% (0)	3% (3)	56% (56)	41% (41)	0.0% (0)
Q23(BI3) I plan to use mobile learning in the next 12 months.	0.0% (0)	0.0% (0)	58% (58)	42% (42)	0.0% (0)

Behavioral Intention had a mean of 3.31 and standard deviation of .465. Responses for behavioral intention questions (Q21-Q23), is aligned with the theoretical relationship between several technology acceptance and use models incorporating intention to use a given technology with the actual usage of that technology. Thus, if a person's intention is to use mobile learning, it is theorized that they will likely do so as intention is a good predictor of usage. The overall results for this series of questions were perceived as being negatively responded to, as 38.7% agreed that they intend to use ICT within the next 12 months and only 1% stated that they did not intend to use ICT with 60.3% neither agreeing nor disagreeing that they intended to use ICT. The prominent fact in this group is that the disagreeing rate is extremely very low that is 1% and that of “neither agree nor disagree is very high which is 60.3%. When we consider the responses on Behavioral Intention for all the three items, less than half of the participants responded “agree” or “strongly agree” to the statement, thus we have 33%, 41% and 42% respectively for Q21, Q22, and Q23. These results indicate that the majority of the participants are not quite confident of their intention to use mobile technology. Therefore, 60.3% of participants responding to “neither agreeing nor disagreeing” that they intended to use mobile technology in their learning.

Conclusion

A number of studies have shown that mobile learning has the ability to reshape the quality of teaching and learning in Higher Education Institutions if accepted and used by the students. A pilot study was conducted at University Technology MARA, Tapah to verify the research question of the study. It was discovered that among the four UTAUT constructs, performance expectancy exerted the strongest effect. Therefore, Performance expectancy is the most influential factor for the acceptance and use of mobile technology by the respondents. Recommendations were made that, all academicians of the should undertake mandatory training and retraining on mobile learning courses. As to provide them with practical and functional knowledge of computer, internet and associated areas of mobile technology for improved effectiveness and efficiency. The government should develop ICT policies and practices that would support lecturers in their academic work and students in their learning. Mobile technology tools should be made more accessible to both academic staff and students.

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