Gender Influence on Undergraduates Students' Acceptance of Mobile Learning Instruction using Technology Acceptance Model (TAM)

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ABSTRACT---- ***The term mobile learning (m-learning) refers to the use of mobile and handheld IT devices, such as Personal Digital Assistants (PDAs), mobile telephones, laptops and tablet PC technologies, in teaching and learning. The use of these devices are gradually increasing and diversifying across every sector of education in both the developed and developing worlds. It is gradually moving from small-scale, short-term trials to a larger more sustained and blended deployment. In this study, 216 undergraduate students of the University of Ibadan were exposed to mobile learning platform using the Technology Acceptance Model (TAM Model). The model contained the following variables: perceived usefulness, perceived ease of use, attitude, peer-influence, behavioural intention to use, interest, technology self-efficacy and acceptance. The paper discussed gender influence on these variables, implications and findings were discussed and recommendations were given.***

1. INTRODUCTION

The use of wireless, mobile, portable, and handheld devices are gradually increasing and diversifying across every sector of education, and across both the developed and developing worlds. It is gradually moving from small-scale, short-term trials to larger more sustained and blended deployment (Traxler, 2007). As the emergence of mobile and wireless technologies are already impacting education, new Internet technologies are being used to support mobile and wireless devices. In a field marked by such a rapid evolution, we cannot assume that the Web is the sole medium for computer-based learning. The combination of mobile and Web-based technologies opens a new horizon for educators. The use of mobile devices for teaching and learning is increasingly popular in education (So, 2008).

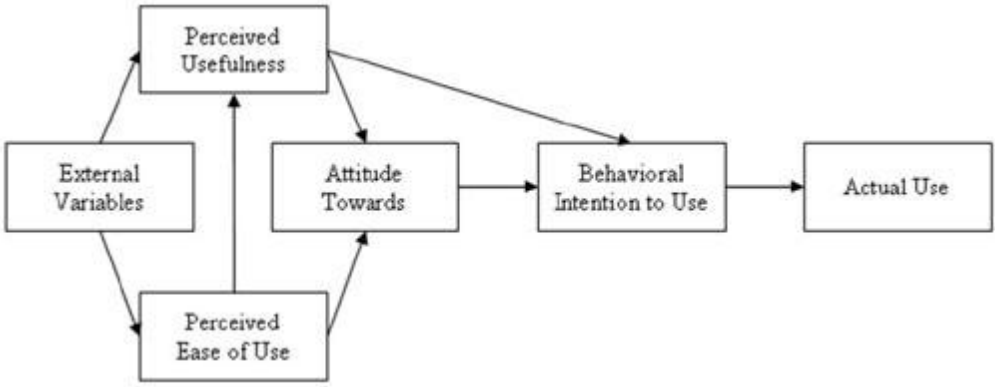
According to EDUCAUSE (2011) one of the educational challenges of the digital age is teaching how to access information.The mandate of the educator in the digital age has changed. The teacher's role is not to deliver knowledge but to teach students how to access information that brings about knowledge. Students need to learn what to make of the information onslaught and how to distinguish biased from legitimate sources, determine what is credible, synthesize information from many sources, and extrapolate truths. Mobile devices in the classroom allow teachers and students to examine the same information and together figure out what to make of it. Student engagement in m-Learning appears to encourage independent and collaborative learning experiences (Metcalf, 2006); helps learners identify areas where they need ICT support (Vermetten, Vermunt&Lodewijks, 2002); and helps combat resistance to use of ICT (Hunt, Thomas & Eagle, 2002).According to Attewell (2005) as quoted by Yousuf (2007), there are several advantages inherent in mobile learning and these include: helping learners to improve literacy and numeric skills; helping learners to recognize their existing abilities; helping learners to identify where they need assistance and support as well as helping learners to overcome the digital divide.

2. THE STUDY

A total of 216 undergraduate students who registered for a course titled "Introduction to Instructional Technology" participated in the study. Out of these participants, 130 were female while 86 were males. A TAM model of technology acceptance which has the following components – perceived usefulness, perceived ease of use, attitude, peer influence, behavioural intention to use, interest, technology self-efficacy and acceptance was used.

The technology acceptance model (TAM) was developed by Davis (1989), based on the theory of reasoned action (TRA) (Fishbein&Ajzen, 1975) in psychology research. According to Masron (2007), the TRA posits that individual behaviour is driven by behavioural intention where behavioural intention is a function of an individual's attitude toward the behaviour and subjective norms surrounding the performance of the behaviour.

Meanwhile, TAM proposes that perceived ease of use and perceived usefulness of technology are predictors of user attitude towards using the technology, subsequent behavioural intentions and actual usage. Perceived ease of use was also considered to influence perceived usefulness of technology. Figure 1 presents original TAM (Davis, 1989)



Original technology acceptance model (TAM) by Davis (1989)

Masrom (2007), applied TAM to test users acceptance of e-learning in terms of Internet and web technology use in accomplishing its mission of delivering information to and interacting with the students through a computer interface, TAM has also been applied in numerous studies testing user acceptance of information technology, for example, word processors (Davis, Bagozzi&warshaw, 1989), spreadsheet applications (Mathieson, 1991), e-mail (Szajna, 1996) web-browser (Morris & Dillon, 1997), telemedicine (Hu, Chau, sheng & Tam,1999) websites (Koufaris, 2002) e-collaboration (Dasgupta, Granger &McGarry, 2002), blackboard (Landry, Griffeth& Hartman, 2006).

However, in this study, TAM was applied to test undergraduate students' acceptance of mobile learning based on their gender. It is generally believed that there exists a gender gap in the access and use of ICTs (Kelkar, 2004; Aremu, 2008). As has been well documented by Hutchinson and Weaver (2004), women's domestic and employment roles have changed from home makers to income earners over the decades. According to Kroker and Weinstein (1994), inequalities in access and use of ICT are about to become a central social problem in the Information Age. It is estimated that computer literacy will soon be a key factor of social mobility as the ICT competent will be able to convert their intellectual capital to economic and cultural capital. Lacking computer knowledge will in turn, increase the risk of social and political exclusion as increasingly more economic and democratic activities go on-line. Three social groups in particular, have been identified as being at risk from exclusion in the information society: women, ethnic and racial groups, and older people (INSINC, 1997).

It has been explained by many researchers that the difference between the use of technology by women and men is largely a sociological phenomenon determined by customary male control of means of acquiring and using the technology; but it may be the way in which technology works and information is designed – usually by men for men-establishes differences in the way men and women use ICT. Females were thought to have more negative attitudes and perceptions about using computers than their male counterparts. Females have also traditionally been less interested than males in pursuing careers in highly technical areas (DiSabatino, 2000; Horiuchi, 2002).According to Huyer (1997), information revolution have bypassed women, there has been little research done on women's information needs and access to information in the developing countries. However, Kalmus (2004) portends that in most age groups, there are no significant gender differences in general awareness and in using the Internet for obtaining professional, political and economic information, or for economic and civic participation. Also, Aremu & Morakinyo (2009) reported that there is no significant gender difference in the use of ICT for research by post-graduate students in a typical Nigerian university. This however needs to be verified because it can affect the outcome of this study and also because it is necessary to identify and locate the areas of differences in bridging the digital divide and providing interventions that would encourage the participation of both gender in the use of technology**.**

3. HYPOTHESES

The following null hypotheses were tested in this study at 0.05 level of significance:

1. There is no significant difference between male and female undergraduate students' perceived usefulness of mobile learning.
2. There is no significant difference between male and female undergraduate students' perceived ease of use of mobile devices for learning.

3. There is no significant difference between male and female undergraduate students' attitude to mobile learning.
4. There is no significant difference between male and female undergraduate students' peer influence towards mobile learning.
5. There is no significant difference between male and female undergraduate students' behavioural intention to use mobile devices for learning.
6. There is no significant difference between male and female undergraduate students' interest in mobile learning.
7. There is no significant difference between male and female undergraduate students' technology self efficacy.

4. RESULTS

HO1: There is no significant difference between male and female undergraduate students' perceived usefulness of mobile learning.

Table 1: T-test showing the difference between male and female undergraduate students' perceived usefulness of mobile learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
PRECIEVED USEFULNES							
Male	86	23.10	2.27				
				-.316	214	.752	NS
Female	130	23.20	2.10				

Table 1 shows that there is no significant difference between male and female pre-service teachers' perceived usefulness of mobile learning after their exposure to mobile learning platform ($t = -0.32$; $df = 214$, $P > 0.05$). This implies that both male and female undergraduate student perceived mobile as useful for their learning. This could be attributed to the fact that they all have mobile devices and they can access their learning content on the go.

HO2: There is no significant difference between male and female undergraduate students' perceived ease of use of mobile devices for learning.

Table 2: T-test showing the difference between male and female undergraduate students' perceived ease of use of mobile learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
PERCIEVED EASE OF USE							
Male	86	25.92	2.83				
				-.406	214	.685	NS
Female	130	26.08	2.79				

Table 2 shows that there is no significant difference between male and female undergraduate students' perceived ease use of mobile devices for learning after their exposure to mobile learning platform ($t = -0.41$; $df = 214$; $P > 0.05$). This implies that both male and female undergraduate students found it easy to use mobile devices for learning.

HO3: There is no significant difference between male and female undergraduate students' attitude to mobile learning.

Table 3: T-test showing the difference between male and female undergraduate students' attitude to mobile learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
ATTITUDE							
Male	86	9.17	1.02				
				-.232	214	.817	NS
Female	130	9.21	1.04				

Table 3 shows that there is no significant difference between male and female undergraduate students' attitude to mobile learning after their exposure to mobile learning platform ($t = --0.23$; $df = 214$; $P > 0.05$). This implies that both male and female undergraduate students have positive attitude towards mobile learning.

HO4: There is no significant difference between male and female undergraduate students' peer influence towards mobile learning.

Table 4: T-test showing the difference between male and female undergraduate students' peer influence towards mobile learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
PEER INFLUENCE							
Male	86	8.29	1.79				
				-1.499	214	.135	NS
Female	130	8.63	1.52				

Table 4 shows that there is no significant difference in the influence of peer on both male and female undergraduate students' acceptance of mobile learning after their exposure to mobile learning platform (t = -1.50; df = 214; P > 0.05).

HO5: There is no significant difference between male and female undergraduate students' behavioural intention to use mobile devices for learning.

Table 5: T-test showing difference between male and female undergraduate students' behavioural intention to use mobile devices for learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
BEHAVIOURAL INTENTION TO USE Male	86	8.92	1.54				
				-1.263	214	.208	NS
Female	130	9.16	1.27				

Table 5 shows that there is no significant difference between male and female undergraduate students' behavioural intention to use of mobile devices for learning after their exposure to mobile learning platform (t = -1.26; df = 214; P > 0.05). This implies that both male and female undergraduate students have the same behavioural intention to use mobile device for their learning.

HO6: There is no significant difference between male and female undergraduate students' interest in mobile learning.

Table 6: T-test showing difference between male and female undergraduate students' interest in mobile learning.

Variables	N	Mean	Std.D	t	df	Sig	Remark
INTEREST Male	86	12.59	2.19				
				-2.799	214	.006	NS
Female	130	13.35	1.79				

Table 6 shows that there is a significant difference between male and female pre-service teachers' interest in mobile learning after their exposure to the mobile learning platform (t = -2.80; df = 214; P < 0.05).

HO7: There is no significant difference between male and female undergraduate students' interest in mobile learning.

Table 7: T-test showing difference between male and female undergraduate students' technology self efficacy.

Variables	N	Mean	Std.D	t	df	Sig	Remark
TECHNOLOGY SELF-EFFICACY Male	86	8.15	1.86				
				-.960	214	.338	NS
Female	130	8.40	1.86				

Table 7 shows that there is no significant difference between male and female undergraduate students' technology self efficacy to use of mobile devices for learning after their exposure to mobile learning platform (t = -0.96; df = 214; P > 0.05). This implies that both male and female undergraduate students have technology self efficacy to use mobile device for their learning.

5. IMPLICATIONS OF FINDINGS

The study had shown that gender is not a factor that militate against the undergraduate students' acceptance of mobile devices in the learning and mobile learning. Female undergraduate students' acceptance mobile learning could be because they are used to using mobile devices such as PDAs, mobile phones i-pads and tablet PCs. Of all the variables tested, only interest showed a significant difference and here the mean score of female undergraduate students is greater than that of male undergraduate student. Thus, in this study, it can be safely said that the digital divide that exists between male and female is being closed if not totally closed. The study negates the findings of Green (2000), Schubert (2001) andRoy, Taylor and Chi (2004) who reported that females have traditionally lagged behind males in their willingness to learn about and use technology in schools. However, the study corroborates the findings of Sax, Astin, Korn, and Mahoney (2001), Raban, Soffer, Mihnev, and Ganey (2002),Livingstone, Bober and Helsper (2005) and Aremu and Morakinyo (2009) who stated that the gap between male and female in ICT use no longer exists and that the differences have become more subtle. Female are now using technologies as well as males. Many females are now taking technology-related jobs that were once dominated by males. Female undergraduate students probably embraced mobile learning because learning content and resources are on their finger tips and can be accesses whenever they wish to.

6. CONCLUSIONS

There is no doubt that gender-related issues would continue to be topics of discourse among academics as far as technology acceptance and use are concerned. This is because all along women are being discriminated against since they are being denied equal opportunities with men. They are often subjected to negative stereotype perception. This study therefore recommended that policy awareness of potential gender difference related to technology use is put in place due to manifest gender differences in the past. Also, there should be policy effort aimed at improving female access to technology resources. Females should be more involved in technology related activities in schools as this would boost their confidence as lack of confidence could be enough to deter a girl who would otherwise be interested in a career in technology from pursuing it. It would be an unfortunate thing for an uncomfortable experience with technology use to hinder a student from pursuing a career for which she might be well suited. Teachers therefore need to take notice of this possibility and do what they can to encourage all students and make them feel as confident as possible about using computers.

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