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# Predicting Mobile-Learning Culture Model at Institutions of Higher Learning: Implications on Curriculum Design

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## ABSTRACT

Advances in computer and communication technologies have enriched communication and learning methods, demanding further improvement in curriculum design. This study explores mobile-learning (m-learning) culture among students of Malaysian institutions of higher learning (IHL). Two objectives are set: Firstly, to establish a culture of mobile wireless technology (MWT) application in tertiary learning; and secondly, to design a curriculum and validate the m-learning model incorporating the learning culture at higher learning institutions involving components such as ethics, social norms and attitude. A survey was carried out on 490 random samples drawn from students of five universities and one community college in Malaysia. Data collected were analysed using descriptive statistics to address the first objective of the study. A Structural Equation Model (SEM) of mobile-learning culture at institutions of higher learning (IHL) was designed and validated to fulfil the second objective. The findings suggest that: The model is able to explain significant contributions from all predictors on the actual use of MWT in learning. In conclusion, the study confirms that educators should include ethics and behavioural components while designing curriculum for institutions of higher learning in Malaysia.

*Keywords:* Behaviour guideline, curriculum design, ethics, mobile wireless technology, learning attitude, social norms

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## INTRODUCTION

The term curriculum refers to the lessons and academic content taught in a school (Oxford Dictionary, 2015). A curriculum

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is conceptualised as the planned learning materials designed in prescribed instruction to be taught (Marsh & Willis, 2003). According to Petrina (2004), what is to be learnt and how it is organised are discussed in curriculum and instructional design. Both learning theories and design are said to play equal importance in a curriculum. Thus, the existing curriculum for any subject must be well addressed and periodically revisited to ensure the needs of learners and the larger goal of nation building are being achieved.

The existing curriculum content of higher learning institutions is structured to fulfil employability skills and economic aspirations. Nevertheless, when learning content is too structured and created, students no longer enjoy the space to be creative. It is important that lecturers and curriculum developers revisit the structure of curricula with integration of computer technology and applications to ensure authentic learning resources and experiences.

In early writings on curriculum integrity, Eisner (1970) and Eisner and Vallance (1974) outlined five specific orientations of curriculum design, namely, academic rationalist, cognitive processes, self actualisation, social reconstruction and utilitarianism. Firstly, for the academic rationalist, the primarily concern is on the disciplinary knowledge and cultural aspects. Secondly, cognitive processes relate to intellectual reasoning skills such as problem solving. Thirdly, self-actualisation involves personal relevance orientations where psychological conditions are emphasised and focus is on individuality and personal expression. Fourthly, social reconstruction deals with critical pedagogy and stresses sociological conditions, social justice and collective reforms. Lastly, the utilitarian orientation is primarily concerned with the functional competencies, performance, procedure and instructional efficiency. No specific curriculum emphasises on all five orientations. The orientation that fits is the orientation that answers the demands of the economic and global pressures of the era. Thus, a curriculum designer must be aware of employability needs and demands to ensure that the products of higher learning institutions are well received by industry and society when they graduate.

The main objective of this study is to comprehend the learning culture that requires curriculum designers to engage in the utilitarian orientation where instructional efficiency is concerned. Technological advancement in computer and communications has changed the culture of communications and learning. Thus, we need to address the issue of learning culture and how it may affect the curriculum design of higher learning institutions. "A learning culture is a set of organizational values, conventions, processes, and practices that encourage individuals and the organization as a whole to increase knowledge, competence, and performance" (Oracle, 2013, p.1). This study was designed with a focus on predicting the model of a learning culture where ethics, attitude and social norms affect the use of mobile wireless technology in learning. The

following discussion is based on related research and how it moulds the framework of the study.

## Ethics of Using Mobile Wireless Technology

Mobile technology has impacted people in many ways, from reducing geographical distance and expanding social connection networks to placing information on one's fingertips and improving one's lifestyle. Previous research included the importance of mobile technology in learning (Ismail & Idrus, 2009; Tan & Kinshuk, 2009; Alvarez, Alarco, & Nussbaum, 2011). Very little discussion and elaboration on research has been explored in terms of ethical use of mobile technology in the context of social connectivity and information sharing. Ethics relates to the rules of behaviour about what is good and bad (Merriam-Webster, 2011). In another context, ethics relates to culture that is embedded with values. In this world without boundaries, one can easily invade the privacy of others and disclose information without permission. However, in mobile technology, which uses wireless Internet connectivity, other bigger issues arise such as unsecured passwords that a wider audience access to information from individual mobile sets. In the context of social behaviour, the use of mobile technology in inappropriate situations creates unhealthy social environments. These include driving distractions (Young, Regan, & Hammer, 2007; Lam, 2002), annoying use of mobile phones in public and its applications in public restricted venues (Turner, Love, & Howell, 2008) and also boundaries between work and social life (Gant & Kiesler, 2002). There is no guided rule of ethical use of mobile phones except that the action becomes acceptable behaviour that moulds changing social norms.

## Social Norms

Social norms relate to culture or communication norms. In the context of Asian countries, religion plays a very important role in shaping the culture. Ribble, Bailey and Ross (2008) related the norms of behaviour with technology as digital citizenship. They have identified nine areas of behaviour in digital citizenship i.e. i. Etiquette, which involves procedure or standards; ii. Communication, which relates to the exchange of information; iii. Education processes, which involve teaching and learning; iv. Access to technology and society; v. Business and commercial use; vi. Responsibility for actions taken; vii. Autonomous freedom for the digital world as well as safety and security. They have also explained that there is no written rule for all the aspects of behaviour in using mobile technology. Thus, its benefit lies in using it correctly and for socially beneficial purposes. In this present study, social norms indicate parental involvement, religious influence and the people around the individual who mould his decision to use or not to use mobile technology as part of his lifestyle.

**Attitude in Using Mobile Technology**

Abouzahra and Tan (2013) propose a framework of mobile technology use in personal health records. They refer to attitude as the extent to which the individual values the use of mobile technology in the context of health. MacCallum and Jeffry (2013) analysed the construct of attitude in the study of ICT skills and adoption in mobile learning. Attitude has been confirmed as a construct developed by items related to self efficacy and perceived usefulness. Their findings also indicate the importance of specific ICT skills in the adoption of mobile learning. Other research has shown that attitude and subjective norms affect mobile banking adoption (Aboelmaged & Gebba, 2013). However, Aboelmaged and Gebba also found that behavioural control and usefulness were not significant predictors to mobile adoption in banking. Evaluating the concept of using mobile technology as lifestyle, attitude in this study relates to the agreement among individuals that using mobile technology is positive or negative. This includes motivational incentives of mobile use based on its main features such as needing to take a digital device everywhere, being willing to spend money, being able to communicate easily and finding it useful in daily life. Thus, using mobile technology calls for being willing to invest money and time, even to purchase the most updated/ latest gadget or software in the market. Thus, the construct of attitude comprises not only self reflection on beliefs but also the usefulness of mobile technology and the ability to control behavior through the skill of using mobile technology to communicate.

**Applications of Mobile Technology in Learning**

In providing evidence of mobile technology use in learning, one must be able to relate to the individual control or skills needed for itse use and application. The use of mobile technology in learning requires specific skills such as downloading the application of Moodle to access a Learning Management System (LMS) and learning tools such as dictionaries, note-taking features and other necessary tools. In any organisation, the use of mobile technology is becoming a necessity and is no longer a choice as learning and teaching is now firmly established in the use of websites or learning portals designed for mobile applications. The application of a LMS, for instance, provides learning and teaching in a comprehensive specially designed package that allows resources and information to be quickly and conveniently uploaded, updated and downloaded.

Previous studies have shown the adoption of mobile technology in learning related to ICT skills (MacCallum & Jeffrey, 2013), language learning through noticing and recording (Kukulska-Hulme & Bull, 2009), learning design frameworks (Alvarez et al., 2011), virtual laboratories in engineering education (Alkouz, Al-Zoubi, & Otair, 2008), LMS as a learning package (García-Peñalvo, Conde, Alier, &

Casany, 2011) and usability consideration (Mostakhdemin-Hosseini, 2009). However, applications such as Google map, social network sites for communications and Picassa to store picture libraries can also be used and applied for learning purposes. Mobile technology allows the learning community to remain connected with lecturers as well as learning engagements.

The place of attitude, ethics and social norms in learning culture can be better understood by studying the theory of Planned Behaviour (PBT) by Ajzen and Fishbein (1975). This theory explains the psychological and social factors that are pertinent in the context of Mobile Wireless Technology (MWT) using a model based on attitudes, subjective norms and control beliefs. PBT postulates that attitude is the component that explains the value of self-performance, whether positively or negatively, while subjective norms shape the individual's perceptions about behavior, which is influenced by the judgement of others (parents, people, friends). Control beliefs conceptually relate to the self efficacy that facilitates or impedes behaviour. The model of attitude, subjective norms and control beliefs is said to predict the intention to act and the actual behaviour. In this study, control belief is replaced with the perceived usefulness of MWT. Thus, the hypothesised model is postulated to indicate three predictors (social norms, attitude and ethics) on the actual use of MWT in learning.

**Predictors of Planned Behaviorial Theory (PBT)**

Linking the concept of beliefs and behaviour, Ajzen and Fishbein (1975) explored a model that predicts the deliberate behaviour of an individual. They expanded the original idea behind the Theory of Reasoned Actions by including an additional factor, perceived behavioural control. Perceived behavioural control or control beliefs is an expansion of the theory of self-efficacy by Bandura (1986), which is explained using social cognitive theory. Thus, it is about the confidence and ability to control behaviour. Specifically, Fishbein and Ajzen (1975) referred to human actions as being influenced and guided by three factors, namely, behavioural beliefs, normative beliefs and control beliefs. Behavioural beliefs include consideration of the consequence of behaviour that directly affects attitude. Normative beliefs are the consideration of what people think about the action. Control beliefs relate to which factors impede or facilitate the behaviour. It involves the behavioural control of feeling confident to carry out the behaviour, whether or not it is is thought to be easy to perform. Thus, the theory helps us to explain which action would work and which would not. It also helps us understand how we may change the behaviour of an individual.

However, Schepers and Wetzels (2006) asserted that PBT explained only 40% of variance of behaviour. Thus, Ajzen's PBT model can be used by researchers to predict individual behaviour or actions, but with inclusion of other variables for higher model prediction.

**Expansion of PBT: What Do Others Say?**

Buchan (2005) explored individual, social, moral and organisational factors to predict ethical intentions in the public accounting domain. On the other hand, Broaddus, Schmiege and Bryan (2011) expanded PBT from demographic variables, namely, gender to predict the intention to use a condom among high-risk factor adolescents. Moral norms were included in a study where the findings showed the strongest predictor to charitable intentions. This finding was shown in the expansion of PBT by Van der Linden (2011). Baker and White (2010) studied adolescents' engagement in frequent SNS use. They expanded the role of group norms and self esteem. Thus, Ajzen's PBT is applicable not only in the social sciences but also in health sciences and other fields. More factors need to be studied to predict the intended behaviour of an individual.

In terms of attitude in predicting the intention to behave, Fishbein and Ajzen (1975) related it to the evaluation of the behaviour i.e. whether it is positive or negative and the motivation to trigger the attitude. Attitude is said to be influenced by many beliefs but only the salient belief will dominate at certain times (Ajzen & Fishebein, 1975). However, it is difficult to determine which salient belief is affecting the attitude. Further, Sutton (1994) asserts that past behaviour rather than cognition as assumed by PBT influences present behaviour. Past behaviour includes habits that are repeated. However, when people are knowledgeable and informed about what is good and bad, bad habits will no longer serve as the source of information to predict the attitude. Thus, this present study will not look into beliefs but will, rather, determine the attitude of individuals in terms of their ethics in the use of MWT. Attitude refers to preference for the technology and how it applies in the individual's lifestyle.

Perceived behavioural control (PCB) is postulated to be based on a similar concept as self-efficacy by Ajzen (1991), which relates to skills and ability. Conner and Armitage (1998) critically reviewed the literature on PCB and asserted that Dzewaltowski, Noble and Shaw (1990) and McCaul, Sandgren, O'Neill and Hinsz (1993) made clear distinction between self-efficacy and PCB. This is explained from the perspective of self-efficacy as determining academic achievement. However, PCB determines exercise behaviour. Thus, the inconsistency of the prediction of intented behaviour in the findings indicates a careful need to assess whether skills or the need for volitional control of the behaviour is relevant.

In PBT, subjective norms function in the normative beliefs of of people when they are considering whether or not to engage in a behaviour. Thus, whether or no the behaviour is acted on depends on which is greater i.e. the need of the individual to accommodate the perceptions of others or the extent of the motivation to comply with the behaviour. Conner and Armitage (1998) show that subjective norms are the weakest predictor of intention to act out behaviour in PBT. This, however, could be due to the

way it was measured and operationalised in the study. Ajzen (1991) further discussed the issue by suggesting moral norms e included in normative beliefs. This relates to the ethical dimension, which has direct influence on attitude. As elaborated by Raats, Shepherd and Sparks (1995), moral obligation not only affects intention but also directly influences attitude. Thus, PBT model needs further attention to empirically prove the evidence of a new link between ethics and attitude. However, Conner and Armitage (1998) further highlighted that these antecedents may not be the case if personal values or personal norms that shape individual self-identity are involved. Thus, the present study seeks to empirically address the influence of ethics on attitude and ethics on the intention to carry out behaviour in the context of mobile wireless technology usage.

### Theory of Planned Behaviour in the Context of Mobile Technology

Batthi (2015) explored the use of mobile technology in banking, showing an indirect relationship between social norms and the intention to adopt use of mobile technology in banking with ease of use as the mediator. In the Theory of Acceptance Model, Schepers and Wetzels (2006) also found a similar relationship between social norms and perceived usefulness but somehow, social norms can also directly influence the intention to use the specific computer technology. In Kim, Jin and Park (2009), the perceived ease of use, usefulness and enjoymen, and subjective norms directly influenced attitudes towards mobile communication and mobile commerce. Attitude was said to influence the use of mobile technology in shopping. Based on previous research underpinning the Theory of Acceptance Model and the Theory of Planned Behaviour, social norms can function both as a direct and indirect predictor to the intention of carrying out behaviour particularly in mobile technology use.

## METHODS

### Research Design

The questionnaire used in this study was self-constructed based on the operational definitions from Ajzen's Theory of Planned Behaviour. The items (47) were constructed based on four dimensions, namely, attitude, social norms, ethics and actual use of mobile in learning. The questions were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5); (3) was designated as neutral (neither agree nor disagree). The demographic information was also identified. Upon validation, 100 samples of the questionnaire were sent to one university in Kuala Lumpur as a pilot study with a reliability of Cronbach's alpha of 0.67 (acceptable value at 0.60 by Hair, Black, Anderson, & Tatham, 2006).

The final survey was carried out among five universities and one community college in Malaysia. A letter of consent was sent to each organisation, from which the study samples were randomly stratified and selected. A meeting was arranged to meet the respondents, distribute copies of the

questionnaire and administer the survey process with the assistance of the respective university lecturers/college instructors.

The structural equation modelling (SEM) was applied to predict the m-Learning Culture Model shown in Figure 1, which implicates the design of curriculum involving components such as ethics, social norms and attitude. A statistical requirement of 250 samples had been fulfilled since a sample of 490 was randomly selected and responses from these samples were analysed.

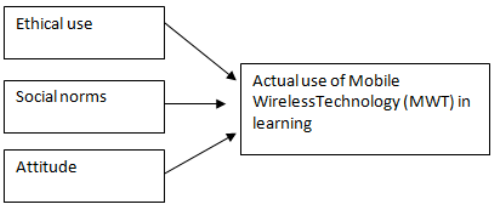


*Figure 1*. Hypothesised model of m-learning culture

Analysis Procedure The data analysis involved descriptive statistics to display the distribution and breakdown of demographic information derived from replies given by the study samples. Structural equation modelling (SEM) was used to validate the adequacy and fitness of the hypothesised model. The following steps were conducted to assure the model's goodness of fit.

i. Delete the offending estimates that contributed to the negative error variances, standardised coefficient exceeded or approaching to 1.00 and very large or too small standard errors indicating approaching 0.00 or 1.00 (e.g. Byrne, 2005).

ii. Assess the overall model fit.

   a. The acceptable model fit measures include X2 statistics with p>0.001 (e.g. Hair, Anderson, Tatham, & William, 1998). Root mean square error of approximation (RMSEA) with values <0.08 were acceptable (Hair et al., 1998), while Levesque et al. (2004) suggested values <0.05 were a good fit, <0.08 were reasonable and >0.10 were a poor fit.

   b. The incremental fit index applied in this study included: the goodness-of-fit index (GFI), incremental-fit index (IFI) and comparative-fit index (CFI) with the values approaching 0.9 and above as a good-fit model (Hair et al., 1998).

iii. Structural model fit

   Once the parameter was estimated concerning the identification of the items loaded on each factor in the measurement model, the full latent structural model was estimated and all measures of good-of-fit were accomplished. The accepted critical ratio (CR) with the t value for the one-tailed test at 1.645 for the 0.05 significant level and 1.96 for the 0.01 significant level were used.

## RESULTS AND DISCUSSION

### Frequent Usage of Social Communications Applications

To plan and design a curriculum based on mobile technology, one must understand

mobile-usage culture among students of higher learning institutions. This study focussed on behaviour relating to the use of the WhatsApp application among 490 sampled students at five selected universities in Malaysia.

Table 1
*Frequent usage of social communications applications with number of students*

| | Whats Apps | Skype | Wechat | Line | Oovoo |
|---|---|---|---|---|---|
| Never | 131 | 329 | 379 | 224 | 277 |
| Once a month | 65 | 223 | 150 | 30 | 17 |
| Once a week | 21 | 80 | 39 | 70 | 72 |
| Twice a week | 321 | 71 | 122 | 350 | 245 |
| Every day | 241 | 76 | 89 | 105 | 168 |
| Total | 779 | 779 | 779 | 779 | 779 |

*Source:* Responses on questionnaire

Table 1 shows that WhatsApp was the most frequently-used social network app (241 responses/daily) followed by Oovoo, Wechat and Line. The lowest daily usage was of Skype. The finding suggests that further research is necessary to integrate the new finding in the curriculum.

## Predicting M-Learning Culture Among Students in Higher Learning Institutions

The hypothesised model was tested to determine whether or not all the three factors, namely, ethics, attitude and social norms directly affected the use of mobile technology in learning. The results indicated that the hypothesised model had to be rejected due to non-significant relationship between ethics and m-learning (β=0.11, critical value <1.96). Thus, the overall results showed a discrepancy of model fit with the sampling where IFI=0.83(results were expected to show non-significant model with IFI>0.9 and GFI >0.9).

A re-specified model was tested such that social norms and attitude affected ethics and ethics directly affected m-learning (Figure 2). The results satisfied the guidelines of the model fit, where IFI=0.905; GFI=0.939; and RMSEA=0.052. Despite p <0.05, it was ignored due to the sensitivity of the chi square values having been affected with a big sample size of greater than 250 (Kline, 2005) (see Figure 2).

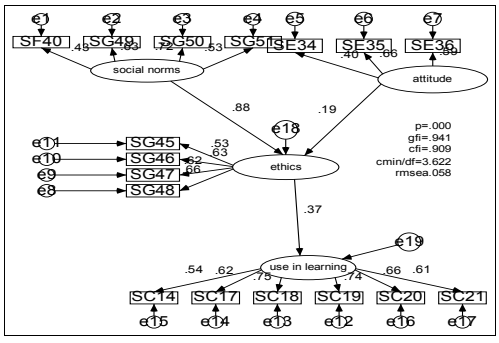


*Figure 2*. Re-specified model of m-learning: Accepted

Table 2
*Standardised parameters with critical ratio >0.96*

| Relationships | | | Parameters |
|---|---|---|---|
| Ethics | <--- | Social norms | 0.763 |
| Ethics | <--- | Usefulness | 0.124 |
| Use in learning | <--- | Usefulness | 0.186 |
| Use in learning | <--- | Ethics | .0311 |
| SG49 I belief people read faster in Sms text than free message applications such as Whatsapp/Viber. | <--- | Social norms | 0.578 |
| SG50 My religion helps me to be aware of my behaviour in using mobile technology. | <--- | Social norms | 0.732 |
| SG51 My parents' advice ensure ethical mobile usage. | <--- | Social norms | 0.446 |
| SF40 People around expect me to update my activities via mobile technology. | <--- | Social norms | 0.435 |
| SE34 I have no problem paying the bill/post paying for my mobile. | <--- | Usefulness | 000.406 |
| SE35 I am able to sit down anywhere peacefully without my mobile device. | <--- | Usefulness | .623 |
| SE36 I am willing to pay any cost for mobile communication. | <--- | Usefulness | .673 |
| SG48 I will use free applications in mobile technology for short messages to reduce my mobile use bill. | <--- | Ethics | 0.654 |
| SG47 I am brief when using mobile techmology to reduce my mobile use bill. | <--- | Ethics | 0.496 |
| SG46 I only reply any call or message if contacted at an appropriate time. | <--- | Ethics | 0.539 |
| SG45 I use my mobile when I am in restaurants only when necessary. | <--- | Ethics | 0.508 |
| SC19 I access course tutorials. | <--- | Use in learning | 0.729 |
| SC18 I access course assignments. | <--- | Use in learning | 0.686 |
| SC17 I access educational games. | <--- | Use in learning | 0.600 |
| SC14 My teacher/lecturer gives me important information for learning. | <--- | Use in learning | 0.531 |
| SC20 I access course tutorials. | <--- | Use in learning | 0.649 |
| SC21 I always explore mobile applications to be used in learning. | <--- | Use in learning | 0.581 |

**Relationship Between Social Norm Factor and Ethical Use of Mobile**

The influence of social norms on ethical use showed significant value where β=0.73. On further investigation, the study found that:

i. The results showed a greater impact of social norms on the ethical justification for the use of mobile technology. This suggests that social norms played an important role in improving access to education and promoting new learning that promoted digital and ethical behaviour among students (Attewell, 2005; Ribble et al., 2008; Valk, Rashid,

& Elder, 2010; Ling & McEwen, 2010). The corollary of this to education is the attempt to recognise and assess the value of non-curriculum learning that may question the legitimacy or supremacy of formal education (Sharples, Arnedillo-Sánchez, Milrad, & Vavoula, 2009).

ii. People around, religion and parents played an important role in shaping the students' action in mobile use. Nowadays, many parents see the potential and value of mobile devices, and as such they help their children with appropriate use of mobile phones at school in order to receive moral and religious instruction away from school.

iii. Student awareness of ethical use of mobiles in daily life indicates a positive culture among students in Malaysian higher learning institutions. It suggests that students' interactions through the mobile phone have added new scope to ethical considerations. Understanding the values that govern the application of daily ethics via mobile-phone use have provided opportunity for the students to see the positive side of society's ethical norms and behaviour, as well as reflect on the social contexts in which these norms and behaviour emerge (Ling & McEwen, 2010). The mobile phone has resulted in tighter ties with friends and family (Ling, 2008). The use of the mobile phone in daily life has brought about socially consistent etiquette that is based on a reflexive sense of what we expect of others and vice versa (Ling & McEwen, 2010; Nordal, 2000).

**Relationship Between Attitude (Perceived Usefulness) Factor and Ethical Use of Mobile Technology**

The calculated value (β=0.124) measured the students' attitude (perceived usefulness). Based on this measure, it can be concluded that:

i. Respondents chose to use mobile technology in daily life, were not able to sit down anywhere peacefully without their mobile device and were willing to pay any cost for mobile communication. This attitude influenced their actions in terms of ethical behaviour to talk briefly to reduce mobile use bills, replying calls or messages at an appropriate time, using mobile devices in restaurants when necessary and using free applications for short messages. This finding was consistent with findings reported in Alhabahba, Mahfoodh, Pandian, Mohammad, Enas, Ali and Hussein (2014), which revealed that Saudi Arabia students enjoyed the benefits of using Smartphones in learning activities. This finding also supported reports from various sources that the interaction between students and communication technology while using mobile phones might allow actual behaviour and ethical development in learning and formation of social ties (Albirini, 2006; Alhabahba et al., 2014; MacCallum and Jeffry, 2013). However, the findings from this study seemed contrary to what had been revealed in Underwood, Luckin and Winters (2012), where students

perceived that the problems related to the use of the interface design; login to use or purchase the product required performing some other tasks. Due to this requirement, students developed the notion that they could no longer restrict the use of mobile phones only for learning purposes.

ii. Despite their willingness to invest money in mobile technology, the students were still careful not to spend unnecessarily. Teenagers' investment in mobile technology compelled their decisions and choices to be dependent on the underlying ethical reasoning employed because they no longer relied on a single decision as they re-aligned the positive and the negative aspects of talking versus texting (Ling & McEwen, 2010).

**Relationship Between Ethical Use of Mobile Factor and Mobile Learning**

The relationship between the ethical use of mobile technology and its actual use in learning shows β=0.311. It can be concluded that:

i. When students talk briefly to reduce mobile use bills, reply calls or messages at the appropriate time, use mobile devices in restaurants when necessary and use free applications for short messages, they learn to use mobile technology (access course tutorials, access course assignments, access educational games, aware that teacher/lecturer gives them important information for learning, always explore mobile applications to be used in learning) and thus, develop adequate mobile-learning culture.

ii. Ethical behaviour in persons or society allow students to think critically about the use of mobile technology in learning. Jones, Issroff, Scanlon, Clough, McAndrew and Blacke (2006) stated that mobile technology users adjusted the gadget in accordance with their way of life, belief and practice. This suggests that the use of mobile technology is shaped by ethics and norms that govern the outcome of these activities. Ethical or appropriate activities are viewed as being a very important part of constructing identity among younger mobile users (Jones et al., 2006). Thus, there are usability and cultural issues that could be derived from the trends in youth culture.

The above findings asserted that the overall prediction of the model was re-specified with the factors of social norms and attitude towards the use of mobile technology, which directly affected the ethical use of mobile technology. With these relationships, it can be said that ethics directly influenced mobile learning. Thus, curriculum designers in higher learning institutions need to address the ethical usage of mobile technology and inculcate social norms before embarking on the real and actual use of mobile technology in learning.

## CONCLUSION

This study revealed that WhatsApp was used by 241 respondents as their most frequent daily social network site. This was followed by Oovoo, Wechat and Line while the lowest daily usage was of Skype. Since there was no specific reason given for these choices, further research should be conducted to enrich the findings on the culture ofusing mobile applications to determine whether or not these choices were influenced by friends or were mainly due to the culture. The findings showed that there was a greater impact of social norms on the ethical justification for the use of mobile phones in higher learning institutions. This suggests that social norms played an important role in improving access to education at the institutions that were surveyed. This finding is consistent with the report by Attewell (2005), Ribble et al. (2008), Valk et al. (2010) and Ling and McEwen (2010). Thus the use of mobile technology should promote new learning and ethical behaviour among students.

The study indicated that the respondents were aware of the usefulness of MWT, and were, therefore, willing to invest in the use of mobile technology for learning purposes. In addition, the people around, religion of parents and schools were important factors in shaping the students' behavior in using mobile phones in the course of their daily lives. This implies that curriculum design should include ethical use of mobile devices and behaviourial guidelines for the use of mobile devices as components or subjects in the tertiary-level curriculum. Further enhancement, encouragement and wider accessibility to using the Internet would further expand the use of m-learning at the tertiary level of education.

The model of m-learning culture tested in this study found that ethics, attitude and social norms affected the use of mobile devices in higher learning institutions. This finding explains the importance of the culture of m-learning, which should be addressed implicitly in designing curriculum for tertiary level education. The significant contributions of ethical use and behaviour guidelines are also necessary for inclusion in the said curriculum as they affect the actual use of MWT in learning. The findings also showed that respondents were willing to invest in mobile technology. This suggests that the education system should accommodate the integration of technology in teaching, learning and assessment. These findings have contributed to the expansion of the Theory of Planned Behaviour (PBT) to include use of mobile technology in learning activities.

### Implications of Study

This study embarked on investigating the issue of technology integration in curriculum design for higher learning institutions. The findings from this study imply that curriculum designers should include a learning module specifically on the ethics of using mobile technology and they should address the issue of the social norms among students to ensure that learning goals and needs be achieved. Further research needs to be carried out

to improve the instrument with greater emphasis given to the actual implementation of mobile learning and applications of mobile technology in learning. A larger population and sample size is needed to improve empirical evidence with respect to variables such as social norms, attitude and ethical use of mobile technology.

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