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ASSESSING VISUAL COMMUNICATION AND CONTENT PERFORMANCE OF MOBILE LEARNING AMONG INTERNET USERS

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OF MOBILE LEARNING AMONG INTERNET USERS**

By

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**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree Doctor of Philosophy**

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Chair: Associate Professor Siti Zobidah binti Omar, PhD
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The growth of mobile technologies and the accession of a new mobile network that is 4G or Forth Generation are deemed as a breakthrough to launch new tool in the pedagogical paradigm known as Mobile Learning. Mobile Learning or M-learning is a distance learning system that gives opportunity for the working adults as well as for those who wants to further their study. Mobile Learning is learning accomplished by the use of small, portable computing devices such as Smartphones and Tablets which help M-learners typically view content and/or lessons in small, manageable formats that can be applied when the laptop or fixed station computers are unavailable. Mobile Learning also an arsenal to support learners and teachers as they navigate the options available in the expanding world of distance learning (McConatha, 2007).

Mobile Learning considered as a stride ahead of e-learning because of its features; fast and extensive, reaching away to the geographically wide-spread learners, even though they have no Internet connectivity. The purpose of this study is to assess visual communication and content performance of Mobile Learning and to identify the performance of 4G mobile network in Malaysia using of Smartphones and Tablets among mobile users. The study applied modified UTAUT (Unified Theory of Acceptance and Use of Technology) model introduced by Liu (2008) which consists of nine key constructs. The four key constructs which were performance expectancy, effort expectancy, social influence and facilitating conditions were based on the original UTAUT introduced by Venkatesth et al. (2003) while the five key constructs were presented by Liu (2008) were self efficacy, mobility, self management, perceived enjoyment and attainment values directly helped to identify the factors of Mobile Learning usage among internet users.

The survey was conducted in Klang Valley area and applied a qualitative in-depth interview using phenomenology approach. The informants were interviewed until the data reaches the saturation point, and they were selected based on purposive and snowball sampling. Thirty informants involved in this study were based on a high and moderate mobile internet and internet users. NVivo 10 software was used to analyze the data and to create themes and categories, apart from using triangulation to ensure the reliability and validity of the study. There were constructive effects of Mobile Learning results. It appears that the future generations are extremely subject to use new technology as a matter of fact, they appear to embrace it. All of the informants were seemed to be amazed with collaboration between Mobile Learning and 4G mobile network; as an educational platform for users/learners which they uttered will be a good learning program. They were also expressed that it may be the learning future program for those who want to study, but yet do not have time to attend classes due to busy with works, attending late meetings and outstations. The results of the study show that the informants were satisfied with the visual communication and content performance of Mobile Learning as well as the 4G mobile network performance and recommended to execute Mobile Learning policies and program as soon as possible.

Mobile Learning considered to be a new program that will continue to gain popularity in the future based on its convenience. With the development of social networking such as Facebook, Twitter, MySpace, Instagram and many others, blogging and YouTube, the users expect to be able to utilize mobile technology on the fly to connect anywhere and anytime of the daytime. The fact was that convenience is everything in today's busy society and will remain to be in generations to occur. Generally, it can be concluded that Mobile Learning had received an encouraging outcomes from the informants. Further, it is suggested that more research need to be conducted in the future, focusing on different modes of devices such iPod and MP3.

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Abstrak tesis yang dikemukan kepada Senat University Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah.

MENILAI KOMUNIKASI VISUAL DAN PRESTASI KANDUNGAN TENTANG PEMBELAJARAN MUDAH ALIH *(MOBILE LEARNING)* DI KALANGAN PENGGUNA INTERNET

Oleh

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Pengerusi: Profesor Madya Siti Zobidah binti Omar, PhD
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Pertumbuhan teknologi mudah alih dan penglibatan rangkaian mudah alih yang baru iaitu 4G atau Generasi Ke-4 merupakan satu kejayaan membulus pelancaran alat baru dalam paradigma pedagogi yang dikenali sebagai *Mobile Learning* atau *M-Learning*. *Mobile Learning* merupakan satu sistem pembelajaran jarak jauh yang memberi peluang kepada golongan dewasa yang bekerja dan juga mereka yang ingin melanjutkan pelajaran mereka. *Mobile Learning* merupakan pembelajaran yang dicapai dengan penggunaan alat yang kecil, komputer mudah alih seperti telefon pintar dan *Tablet* bagi membantu M-pelajar atau *M-learners* secara kebiasaannya melihat kandungan dan atau pelajaran yang unik, format terkawal yang boleh digunakan apabila komputer riba atau komputer stesen tetap tidak tersedia. *Mobile Learning* juga merupakan alat bagi menyokong pelajar-pelajar serta guru-guru yang ingin mengemudi pilihan masing-masing dalam dunia pembelajaran jarak jauh yang dikatakan semakin berleluasa (McConatha, 2007).

Mobile Learning dianggap sebagai satu langkah maju ke hadapan kepada pembelajaran secara elektronik atau *e-learning* kerana mempunyai ciri-ciri; cepat dan meluas, dapat mencapai pelajar-pelajar dari kawasan geografi secara meluas, walaupun mereka tidak mempunyai sambungan Internet. Tujuan kajian ini adalah untuk menilai komunikasi visual dan prestasi kandungan *Mobile Learning* dan juga mengenalpasti prestasi rangkaian mudah alih 4G di Malaysia dengan penggunaan telefon pintar dan *Tablet* di kalangan pengguna-pengguna telefon bimbit.

Kajian ini telah dijalankan di sekitar Lembah Klang dan telah menggunakan kaedah kualitatif wawancara secara mendalam serta menggunakan pendekatan fenomenologi. Pemberi maklumat ditemubual sehingga data mencapai tahap tepu dan mereka telah

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dipilih menerusi kaedah persampelan bertujuan bola salji *(purposive and snowball sampling)*. Seramai tiga puluh pemberi maklumat yang terlibat merujuk kepada penggunaan Internet mudah alih dan Internet yang tinggi dan rendah. Perisian komputer NVivo telah digunakan untuk menganalisa data-data dan membantu membentuk tema-tema serta kategori-kategori, selain daripada menggunakan triangulasi untuk memastikan kebolehpercayaan dan kesahan kajian. Terdapat kesan yang membina berdasarkan keputusan *Mobile Learning*. Ini merujuk kepada generasi akan datang adalah amat tertakluk kepada menggunakan teknologi baru sebagai alat untuk mencari informasi, mereka mudah menerimanya. Kesemua pemberi maklumat kagum dengan gabungan di antara *Mobile Learning* dan rangkaian mudah alih 4G; sebagai platform pendidikan untuk pengguna/pelajar yang keseluruhan mengatakan program pendidikan ini adalah yang terbaik. Mereka juga berpendapat bahawa ia akan menjadi program pembelajaran di masa depan bagi mereka yang ingin melanjutkan pelajaran, tetapi tidak lagi mempunyai masa untuk menghadiri kelas kerana sibuk dengan kerja-kerja harian/pejabat, menghadiri mesyuarat dan ke luar-luar bandar. Keputusan kajian menunjukkan bahawa pemberi maklumat berpuas hati dengan komunikasi visual dan prestasi kandungan *Mobile Learning* serta prestasi rangkaian mudah alih 4G dan disyorkan untuk dilaksanakan dasar-dasar *Mobile Learning* dan program ini secepat mungkin.

Mobile Learning dianggap sebagai satu program baru yang akan terus menjadi semakin popular pada masa akan datang berdasarkan kepada kemudahannya. Dengan adanya rangkaian sosial seperti Facebook, Twitter, MySpace, Instagram dan lain-lain lagi, blog dan YouTube, pengguna-pengguna berharap dapat menggunakan teknologi mudah alih dengan cepat dengan penyambungan di mana-mana sahaja dan pada bila-bila masa. Hakikatnya kemudahan adalah segala-galanya dalam masyarakat yang sentiasa sibuk dan ini akan kekal dalam generasi yang akan datang. Secara umumnya, ia boleh disimpulkan bahawa *Mobile Learning* telah menerima sambutan yang amat menggalakkan daripada pemberi maklumat. Justeru it, di masa akan datang, dicadangkan perlu membuat lebih banyak kajian dan tumpuan perlu diberikan kepada cara yang berbeza iaitu dengan penggunaan peranti iPod itu dan MP3.

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I certify that a Thesis Examination Committee has met on 14 July 2015 to conduct the final examination of Eizan Azira binti Mat Sharif on her thesis entitled "Assessing Visual Communication and Content Performance of Mobile Learning Among Internet Users" in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The committee recommends that the student be awarded the Doctor of Philosophy.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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Date:

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Declaration by graduate student

I hereby confirm that:
- this thesis is my original work
- quotations, illustrations and citations have been duly referenced
- this thesis has not been submitted previously or concurrently for any other degree at any other institutions
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Declaration by Members of Supervisory Committee

This is to confirm that:
- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in Rule 41 in Rules 2003 (Revision 2012-2013) were adhered to.

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Supervisory   Supervisory
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2G	2 Generations
2.5	2.5 Generations
3G	3 Generations
4G	4 Generations
AMTS	Advanced Mobile Telephone System
CBI/L/T	Computer Based Instruction/Learning/Training
CD	Compact Disc
CDMA	Code Division Multiple Access
CMC	Computer Mediated Communication
DARPA	Defence Advanced Research Projects Agency
DIM	Diffusion of Innovation
DSL	Digital subscriber line
EC	European Commission
eLMS	Electronic Learning Management System
EMS	Enhanced Messaging Service
FDMA	Frequency Division Multiple Access
FTF	Face to Face
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global System for Mobile Communication
HR	Human Resource

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HTC	High-Tech Computer
HTML	Hyper Text Markup Language
ICT	Information and Communication Technology
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
IIN	Informant's Identification Number
IMTS	Improved Mobile Telephone Service
IP	Internet Protocol
IrDA	Infrared Data Association
IT	Information Technology
LAN	Local area network
LOD	Learning Object Download
LTE	Long Term Evolution
MMIC	Monolithic Microwave Integrated Circuit
MMS	Multimedia Messaging Service
MPCU	Model of PC Utilization
MTD	Mobiltelefonisystem D
MTS	Mobile Telephone System
OLT	Offentlig Landmobil Telefoni
OS	Operating System
OUM	Open Universiti Malaysia
PC	Personal Computer

PDA	Personal Digital Assistant
PLE	Personal Learning Environments
PTT	Push To Talk
QWERTY	Standard computer or typewriter keyboard
RSS	Really Simple Syndication
SCT	Social cognitive theory
SIM	Subscriber Identity Module
SMS	Short Message Service
SPM	Sijil Pelajaran Malaysia
TAM	Technology Acceptance Model
TDMA	Time Division Multiple Access
TPB	Theory of planned behaviors
TRA	Theory of Reasoned Action
UM	Universiti Malaya
UMTS	Universal Mobile Telecommunications System
UPM	Universiti Putra Malaysia
UTAUT	Unified Theory of Acceptance and Use of Technology
W/H	Watt hours
WAP	Wireless Application Protocol
WebCT	Web Course Tools
WIFI	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access

WLAN	Wireless local area network
WOU	Wawasan Open Universiti
XP	Extreme Programming

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CHAPTER 1

INTRODUCTION

1.1   Background

Mobile technologies are already pervasive and have become a familiar part of the lives of almost everyone.   Newer developments in mobile phone technology are also beginning to offer the potential for rich multimedia experiences and for location specific resources (Naismith et al., 2004). Mobile technologies offer an opportunity for a fundamental change in education away from irregular use of a personal computer in a lab towards more embedded use in the classroom and beyond (Hennessy, 1999). Latest developments in mobile technology have demonstrated that they possess a great amount of potential for educational use (qrcodescanning, 2015).   The dominant of mobile technologies is in itself that acts as a motivator to develop an individual for learning. This means personal mobile devices such as mobile phones and tablets are now ubiquitous amongst learner populations at colleges and university.   Mobile technologies offer learning experiences which can effectively engage and educate contemporary learners and which are often markedly different from those afforded by traditional desktop computers. These devices are used dynamically, in many different settings, giving access to a broad range of uses and situated learning activities. The personal nature of these technologies means that they are well suited to engaging learners. Educators should seek to exploit the ability of the technologies an individual brings with them and find ways to put them into good use for the benefit of learning practice (Sharples, 2003).

Mobile technologies are becoming more embedded, ubiquitous and networked with improved capabilities for rich social connections, context recognition and internet connectivity. Such technologies can have a great effect on learning. Learning will go beyond than classroom parameter and move into the learner's environments, both real and virtual, thus becoming more situated, personal, collaborative and lifelong. The challenge will be to discover how to use mobile technologies to transform learning into a seamless part of daily life to the point where it is not recognized as learning at all (Naismith, Lonsdale, Vavoula & Sharples, 2004).

Education acts as a process that depends on a great deal of direction of learners and resources. Mobile devices can be utilized by teachers for attendance reporting system, reviewing student marks, general access of central school data, and managing their schedules more effectively. In higher education, mobile devices can provide course material to students, including due dates for assignments and information about timetable and room changes. The examples of using mobile technologies in this context include a mobile learning organizer which has been developed and tested at the University of Birmingham (Holme & Sharples 2002; Sharples et al., 2003; Corlett et al., 2004), and the use of mobile phone technologies to support computing students (Riordan & Traxler 2003).

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The forecast shows the number of mobile phone users in the Asia Pacific region from 2011 to 2018 is approximately 2.27 billion, which is expected to increase to almost 3 billion by 2017 (Statista, 2015). Among the fields that are improving, considerate and commercial is the learning discipline. With such convenient technological development, it encourages the growth of M-Learning (Mobile Learning) which can be simply reached at anytime and anyplace. E-Learning on the other hand, also lets the learners to study at any place at any time, however, they must own a suitable designed computer (Howstuffworks, 2010).

M-Learning can be defined as the development of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, help, enhance and outspread the movement of learning and teaching (Tribal, 2010). According to McConatha and Praul (2007), M-Learning as it is oftentimes known as a somewhat latest tool in the academic areas that helps students and instructors to explore the choices offered in the growing world of space training. The designer aims to project M-Learning function that can be experienced by everyone at any place and at any time.

1.2   Problem Statement

When M-Learning project commenced in 2001, there were only a few people who were familiar with the M-Learning concept and certainly could visualise the ability of mobile devices in learning program. The M-Learning blueprint was sponsored by the European Commission and the project allies (in England). The Learning and Skills Council believed that M-Learning is an unconventional and exclusive learning program compared to E-Learning. The main issue is to enrich the learning resources or materials in order to run with handheld or mobile tools in a time of rapid technological growth. It is also targeted to those uninterested or reluctant youth and adult learners along with inadequate literacy and expertise (Attewell, 2004). The recognition of M-Learning does not merely triumph in Europe (UNESCO, 2012) and United Stated of America (Donaldson, 2011), but also in Asian countries for instance India (Hemabala & Suresh, 2013), China (Zhu, Guo & Hu, 2012), Philippines (UNESCO, 2012), Indonesia (Yusri & Goodwin (2013) as well as in Singapore (So, Kim & Looi, 2008). Even in Africa (Brown, 2003), M-Learning has been implemented to help those rural area people (the learners) to get educated. The main reason is – their home is so far away from school, thus they have to walk miles away in order to get to school. So, the institution decided to provide mobile phone with content for the learners, but this is basically Short Message Service (SMS) which is text based.

Since then, M-Learning has become a component of learning program in most of their colleges and universities. In contrast, although the growth of awareness and usage of mobile devices such as Smartphones and Tablets is increasing tremendously in Malaysia, the purposes of these devices are limited to updating news on Facebook, Twitter and Instagram, besides connecting with people through chat applications like WhatsApp, Telegram and WeChat. This shows that the focus is merely on social media and e-social interaction rather than exploring the benefits of the mobile applications itself. Malaysians only concentrate on the usage of free access of WiFi and mobile Internet, and the most frequent online activities are; booking movies, ordering food,

playing games and watching YouTube or movie (Song, Murphy & Farley, (2013); Jambulingam & Sorooshian, (2013)). Based on the history of E-Learning in Malaysia, the acceptance of Malaysian societies towards this application takes time. Since OUM launched an E-Learning program in 2000, only 743 working adults enrolled (Ali, 2011). Every year, people enrolled in e-learning, but the process was very slow. It took almost 10 years for the Malaysians to acknowledge E-Learning. This may apply to the acceptance of M-Learning as well. Even so, with current mobile technologies and the consistent growth of Malaysian mobile phone users who are obsessed with the current gadgets such as iPhone 5, Samsung Galaxy Tab, HTC, Nokia C7 and Nokia E8, the participation of Malaysians to learn more about M-Learning can be expected.

The evolution of E-Learning in Malaysia is due to its flexibility or ubiquitousness of learning and the concept of anytime and anyplace which draw the attention of learners who are working adults yet unable to go to class. The presence of E-Learning major equipment was focused on Personal Computers (PC) where most of the learners received their modules of selected course, assignments as well as assistance from the tutors through virtual learning. Nevertheless, the management of PC was imited, thus learners were more comfortable to check emails and other internet activities through mobile phones and devices. This shows the use of mobile phone and devices such as Smartphones and Tablets is capable of allowing pedagogical procedures to be carried out at anytime and anyplace. This also contributes to the evolvement of a new value of education scheme that is emerged and transformed from a PC such as E-Learning to M-Learning.

Currently, M-Learning is believed to be a new exercise in the pedagogical study. The growth of E-Learning in Malaysia is due to the needs of the working adults, where they needed to be able to retrieve material at their spare time. Hence the materials were being made available via E-Learning. Per se, the existence of Open University Malaysia (OUM) which is based in Kuala Lumpur and Wawasan Open University (WOU) which is based in Penang specified an encouraging reaction. Since E-Learning, retrieved good reaction from the working adults, the researcher wanted to find whether they are trained to utilize mobile devices such as Smartphones (with wide screen) and Tablets which is also known as M-Learning. Malaysians are extremely exposed to mobile technologies, for both Smartphones and Tablets, it is considered the best time to initiate M-Learning as a part of learning plans. Though, the acknowledgement of mobile technologies is deemed as subtle because most of Malaysians are at ease to use simple application such as the Short Message Service (SMS), making and answering calls and reading emails.

Undoubtedly, the new technology will be recognised as well as familiarized by Malaysian Internet mobile/Internet users as a part of daily life sooner or later. The questions focus more on preparation to practice and adapt M-Learning as a pedagogical program. Equally we recognise that education is the direction or teaching skills that one obtains or gains. It comprises activities related to knowledge or information, usually in schools, colleges or university institutions. The educationalists are recognising computer and multi-based educational tools as facilitating learning and enhancing in terms of social communication (Saipunidzam et al. 2008). With such

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facilitating feature it offers, it will encourage the learners to practice on acceptance and adaptation of new technology.

To date, only a few studies had been done pertaining to M-Learning in Malaysia and most of these inquiries were conducted exclusively via quantitative research method, through survey. In this research, qualitative research method is utilized via in-depth interview technique to congregate the data. To further support this research, the researcher used the eLMS (electronic learning management system) as a part of M-Learning prototype to assist and to provide firsthand experience for the informants. From here, the researcher may identify whether the informants are comfortable to use M-Learning or otherwise. As M-Learning is considered new in Malaysia, to assess visual communication and content performance among the informants while they are experiencing M-Learning is extremely critical. Based on previous research, M-Learning was nly emphasized in terms of Short Message Service (SMS), learning exchanges based on text messages (syllabus, schedules, learning content, quizzes, information, results and others). For this research, the researcher decided to emphasize eLMS using Smartphones and Tablets for learning. The learning contents are presented via video which is known as panopto video platform (the lecturers provide their tutorial chapters via videos). It supports pdf. files and html documents (hypertext markup language). The learners can retrieve courses chapters via online and the materials can be printed. In-depth interview technique expectantly assists the process of identifying the feedbacks of both of the outcomes from the new technology and M-Learning itself. Furthermore, it serves to find out the degree of adaptation towards the innovation among the informants including innovators, early adopters, early majority, late majority and laggards. Previous research did not specify any behavioral changes and effect on M-Learning.

For this research, the researcher also focuses on motivational issues as these will help the researcher to identify the issues or factors that lead to lack of motivation among the informants to engage with M-Learning. Regardless whether the informants are high, moderate or low Internet/mobile internet users, this information is extremely vital because it will support the improvement of M-Learning as an education platform in the future.

1.3   Research Questions

Based on the above scenario, research questions for this study are divided into several key constructs: -

a)   For visual communication: how far factor of perceived enjoyment and content performance: how far the factors of performance and effort-expectancy, self-eficacy and facilitating conditions, and other factors such as social influence, mobility, self-management, and attainment values can be achieved among mobile users.

b)   What will be the lack of motivation factors among mobile users to engage with M-Learning?

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1.4   Research Objectives

The general objective of this research is to assess visual communication and content performance of Mobile Learning (M-Learning) among mobile users.

Based on the statement of research problem outlined earlier, the specific objectives of this research are:

1)   For visual communication: to understand factor of perceived enjoyment of mobile learning and content performance: to understand the factors of performance and effort-expectancy, self-efficacy and facilitating conditions and other factors such as social influence, mobility, self-management and attainment values can be achieved among mobile users.

2)   To understand the lack of motivation factors among mobile users to engage with M-Learning.

1.5   Significance of the Study

As mentioned previously, to date, there are a few studies documented to explore M-Learning application. Hence, this study is significant to provide some insights along the practice of M-Learning application approach with Malaysian mobile phone users. Based on the study, the fact that M-Learning may help to change the attitude of Malaysian Internet mobile/internet users to adapt and accept M-Learning application may be discovered. This will serve as a useful information for other researchers as well as academicians.

The researcher decided to apply the qualitative research method.   According to Merriam (2009), qualitative researchers are involved in understanding the consequence, people have structured, that is in what way public make sense of their world and the involvements they have in the world.   Hence, in order to ascertain the usage of M-Learning among the informants, qualitative research is believed to be the most significant method.   Since this research is more on the acceptance of technology, the researcher determined to use Unified Theory of Acceptance and Use of Technology (UTAUT).   UTAUT has been developed by Venkatesh et al. (2003). It published the outcomes of a research that are formed and proven as a new research model with several key constructs which are theorized to be vital features of the user's behavioral intention of information technology.   However, for this research, the researcher used the UTAUT model as guidelines to help to discover the reasons an individual engages with M-Learning.   In order to understand peoples' acceptance process towards M-Learning, previous adoption models are called for proper modifications and extensions on their original structure when using it in a social context.   As Carlsson et al. (2006) stated, Technology Acceptance Model (TAM) and UTAUT were developed to describe and explain organisational adoption of information technologies, "but that the mobile technology adoption is more individual, more personalised and focused on the services made available by the technology" (Carlsson et al. 2006).   In addition to this, Diffusion of Innovation theory which is also widely used in Information System (IS) field does

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not give a particularly exact guidance regarding the adoption of mobile technology, as mobile technology tends to be adopted by non-tech-savvy users once they considered technologies are useful, according to the empirical study of Carlsson et al. (2005). This analysis may be an eye opener to related practitioners of the importance of having M-Learning intervention in training with diverse groups of masses. It may also help in M-Learning policy making in Malaysia.

1.6   Research Scope

For this research, the researcher only focuses the high (70-80 per cent) and moderate (50-60 per cent) Internet/mobile Internet users in Malaysia because the researcher have had difficulties with low Internet/mobile Internet users (below 50 per cent). The low Internet/mobile Internet users do not know how to use the Internet. They also have difficulties to understand the M-Learning application itself. Nevertheless, this event is considered necessary as it helps the researcher to understand thoroughly the factors leading to lack of motivations to engage with M-Learning.

For pre-testing, the researcher has conducted four focus groups. Each group consists of 10 people who are university and college students, lecturers, school students and working adults. As for in-depth interviews, the researcher decided to interview 10 people that consists of university and college students, lectures, school students and working adults. The devices are two iPads, four Smartphones, two Galaxy Tab 7, two Galaxy Tab 10, 4G Zoom and 4G Huddle. As an overall result, the researcher failed to identify the reactions from each participant as they all agreed with one particular individual whom they called a group leader. The researcher observed that the participants simply nodded their heads as a sign of agreement to the comments given by the group leader.   There was no argument among the participants along the discussions. The researcher also observed that the group leader was competent in technology and M-Learning. The group leader told the researcher that he or she used mobile Internet at about 80 per cent. When the researcher asked for a second view from the others, they appeared to recapitulate the responses that have been passed on by the group leader. For in-depth interview, the results seem to be positive as the informants straightaway gave their opinion based on the given questions. Thus, the researcher had decided to conduct in-depth interviews for this research. The research only focusses in Klang Valley and Selangor areas because of strong 4G mobile network coverage.

1.7 Definitions of Keywords

1.7.1 Visual Communication

According to Hilligos and Howard (2002), visual communication means all the ways that writers and readers interact through the feel of the pages and screens. Visual design means the structured process of designing for this interaction. There are other, similar, overlapping terms. The widely used term, document design covers much the same ground as visual communication, leave out that document design may also refer to matters of oral communication, such as employing certain types of paragraph and sentence structure that have been demonstrated to be well read by readers (Shriver; Felker et al., (N.d.)). Communication design and information design also refer broadly to visual communication. Texts and documents refer to both paper and on-screen writing. Likewise, images and graphics are used interchangeably for visuals that are distinct from verbal material. Visual communication is the exchange of ideas through the visual presentation of information, in other words, it is generating a sense with visuals (Griffin, 2008).

1.7.2 Content Performance

Content refers to text material of a file or journal in some form. The content is both information and communication: the total aggregate of the freshness, readability, relevancy, and usefulness of the data offered, and the pattern in which it is dealt out of the information presented, and the way in which it is delivered. It is too known as essence of a communicated message or discourse, as comprehended or received by its intended audience (businessdictionay, 2014). Performance refers to the result of activities over a given period of time. Content performance refers to message and communication that are readable, relevant, usefulness and convenience of the information given in any manner (Illmer, 2011).

1.7.3 M-Learning

M-Learning is a learning method that can happen at any time, and anywhere with the support of a mobile computer device (Dye et al., 2003). M-Learning will introduce new strategies, practices, tools, applications, and resources to recognize the potential of ubiquitous, personal and linked with learning (Wagner, 2005). "M-Learning: A new stage of e-learning": M-Learning provides the facility to study ubiquitously at every time minus with a permanent physical link to cable networks (Georgiev et al., 2004). Convergence is the combination of diverse media, featuring new customized services. The acceptance of high-performance computers, shift to digital platforms, and formation of high-speed, computer networks (Wilkinson, 2003). Performance expectancy is about the mental processes of selection or choosing. It explains the developments that an individual experiences to make preferences. (ValueBasedManagement, 2010). Effort-expectancy is described as the level of easiness that is connected with the utilization of the system (Jvanhengel, 2009). Social influence outlines the stage to which an individual perceives that others consider he or she should utilize a special system (Venkatesh et al., 2003). Facilitating condition is to take in the hesitant act much easier (businessdictonary, 2010). M-Learning prototype

is the application of learning within mobile phone model (Hosseini & Mustajärvi, 2005).

1.7.4 Mobile Technology

Mobile technology is exactly what the name implies – technology that is portable; it signifies to any device that somebody can carry with, to function a wide kind of projects.   It is a technology that leaves those tasks to be achieved via cellular telephone, PDA (Personal Digital Assistant), vehicles, laptops, etc. A typical mobile device has extinct from being no more than a simple two-way pager to being a cell phone, a GPS navigation system, a web browser, the instant messenger system, a video gaming system, and a lot more. It comprises the usage of a variety of transmission media such as: radio wave, microwave, infrared, GPS and Bluetooth to allow the transfer of data via voice, text, video, two dimensional barcodes and more (Daichendt, 2012). Examples of mobile IT devices include (Transformyx, 2004):

- The laptop and notebook computers
- The tablet devices
- The palmtop computers or PDA's
- The mobile phones and smart phones

Mobile devices can be enabled to use a mixture of communication technologies such as:

- The wireless fidelity (WiFi) - a type of wireless local area network technology
- The Bluetooth - links mobile devices wirelessly
- The 'third generation' (3G), global system for mobile communications (GSM) and general packet radio service (GPRS) data services - data networking services for mobile phones
- The dial-up services - data networking services using modems and phone cables
- The virtual private networks - secure access to a private network

1.7.5 Smartphones

A Smartphone is a mobile device that offers cellular attributes along with Internet access abilities. Furthermore, they come with media players, high resolution cameras, touch screens, GPS (Global Positioning System) navigators, WI-FI and several other user applications. Smartphones have formidable computing facilities associated to that of a personal computer. As smart phones are proliferating, the smart phone users are turning off the cord of computers (Engineersgarage, 2012). A Smartphone also offers the ability to broadcast and receive e-mail and edit Office files. Some Smartphones can sustain multiple e-mail accounts. Others include access to the popular instant messaging services, like AOL's (America Online Instant Messaging) AIM and Yahoo! Messenger (Cassavoy 2012).

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1.7.6   Tablets

A tablet PC (personal computer) is a wireless, portable personal computer with a touch screen interface.   The feature of tablet form is usually smaller than a notebook computer, but larger than a Smartphone.   The most common form of tablets is the tab style, like Apple's iPad, Samsung Galaxy Tab or Microsoft's Surface.   These devices, which are what most people intend when they refer to a tablet, have electronics integrated into the touch screen unit. However, external keyboards are offered in slate-style tablets. Some keyboards also work as docks for the devices (Rouse, 2010).

Tablet operating systems, singular operating system is invented to make the most of touch interface. This provides the tablet cool and interactive impression that makes it fun and convenient.   A good operating system is the main part of a great tablet computer.   Popular tablet operating systems involve the Honeycomb version of Google Android, mobile versions of Windows 7 and XP, and Apple's iPad OS (Operating System).   All of these operating systems have different benefits and drawbacks and all features are registered with app stores which boost the capabilities of the tablets.   A touchscreen is a very sensitive control system, so tablet manufacturers try to provide the most user-friendly operating systems and applications to make sure their tablets offer a diverse experience from what a user would get from a laptop or netbook. Keyboards and docks are available in quite a few patterns in which a tablet can benefit from the accession of a keyboard or keyboard-equipped docking station.   While it is possible to type on the face of a tablet, an attached keyboard can make this method easier.   Cameras are crucial. Most of the current generation tablets have forward and rise up-facing cameras.   These cameras are intended to make the use of video-conferencing applications easy and to take a quick high resolution photo (Carmitchel, 2012).

1.7.7   Assess

According to NSW Education (2014), assess is defined as making a judgement of value, quality, outcomes, results or size of something. For this research, the researcher wanted to identify the people's assessment on the value and quality of M-Learning visual communication and content performance by using Smartphones and Tablets with 4G mobile network.   This assessment facilitates the researcher to know how to encourage or stimulate the usage of M-Learning program among working adults and whomever wanted to use M-Learning as a constituent of their training plan.   The assessment may be considered as the key to initiate the development of M-Learning as a part of Malaysian education platform in the future.   Furthermore, the assessment will also assist the researcher to distinguish any features of M-Learning that can be introduced and enhanced. In addition, the assessment helps the researcher to decide new strategies to implement and to set up new codes or policies to affirm and improve M-Learning to be a component of the training program in Malaysia.

1.8   Summary

M-Learning is considered new in Malaysia. However, with thorough exposure and usage of new technologies as well as mobile devices which include Smartphones and Tablets among Malaysians, M-Learning will be accepted inevitably in Malaysia. The intuition about the latest or new technologies regardless Tablets, Smartphones and its applications will definitely boost their interest to know further about mobile learning.

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