



Mobile Learning in the Institution of Higher Learning for Malaysia students : Culture Perspectives

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Abstract— Mobile learning usage in a developing country like Malaysia can be considered new. This literature research is a state of art overview to discuss current issues. The emerging issues come from: types of mobile learning and learning styles; implementation issues of mobile learning; culture dimensions; and user readiness to accept the mobile learning technology. Currently, there is a lack of research about culture aspects to improve mobile learning and university students' engagement in Malaysia. The objective of this research is to find the gap from the culture perspectives of mobile learning in Malaysia at public institutions of higher learning. The discussions have found that the culture dimensions are not a suitable approach to tackle mobile learning. It is therefore suggested to use a more grounded and sensible cultural approach for local context .

Keywords— mobile learning technology, institution of higher learning, culture, Malaysia

I. INTRODUCTION

Mobile learning is considered a new area to be explored in the South East Asia developing region especially in the schools or universities and colleges. Although there are some difficulties in learning, using mobile technology, countries like Malaysia have continued to adopt this new technology. One of the positive outcomes of mobile learning is about taking into account human factors [1]. Influence of the cultural elements are also important factors for learning [4]. Likewise, in the previous MOBIlearn project, the following principles have been adopted: Theory-informed 'do's and don'ts'; guidelines will be validated; and guidelines will be segmented into audiences [39].

The principles guidelines have been related to the usability issues in the process of mobile learning. Currently, the research on how culture is influencing mobile learning has not yet been done comprehensively in Malaysia. The culture theory has been applied to other contents like the comparison between the Malaysian and US web sites, which explained how cultural factors affected the interface layouts due to

its localization [11]. In Malaysia, education institution like University of Nottingham's Malaysia campus has developed a web based mobile learning application which has implemented usability guidelines. However, they are not fully evaluated and quantified yet [8]. In addition, cultural dimensions could help to support improvement in the usability of the mobile application, even though it could be a challenge to determine the appropriate measurement of such research to be conducted [1].

Guidelines and usability will affect the mobile learning quality and user satisfaction. At present, mobile learning is defined as the technology in learning. This is different from e-learning, where the users can use the technology due to its mobility and not to constraint to the places and areas to get the learning information [36][38]. The guidelines are also meant to be: 'Rules or principles for action, encapsulating some combination of practitioner-determined best practices in a domain and research-based insights into factors relevant in that domain' [39]. On the other hand, there are three categories of developing research techniques in mobile learning: mediated data collection; simulations and

enactments; and combination of both methods [15]. In Malaysia, the stakeholders in the mobile learning technology participants come from the education institution. Education institutions in this context refer to the universities, and the colleges for learning new knowledge. Hence, the subject refers to the place where the students will get their education [11][25].

In the education institutions in Malaysia, the stakeholders are the lecturers, the Information Technology officers and also the students where the mobile learning influence them either directly or indirectly. The definition of culture here refers to the cross culture theory where cultural dimensions have been implemented in studying human behavior. More importantly, names like Geert Hofstede, Edward Hall and Fons Trompenaars are well known for their own specific theory of culture dimensions as guidance [11] [13] [17] [20] [23] [24].

This state of art study has been developed to generate ideas towards the style of mobile learning in the higher education institutions using experiential learning and the user centred approach. The discussion also relates to the implementation issues of usability and reliability of the mobile learning software, and the literature discussed the subject in terms of the cultural factors and user readiness of mobile learning adoption. Similarly, an awareness of the mobile learning technologies which addressed the user's need could decrease the cultural and interaction barriers which is altering the attitude of the learners [1].

This literature overview has been done by the following sequences:

- introduction.
- what are the learning types in mobile learning ?.
- why does the implementation issues occur for mobile learning ?.
- what are the types of culture dimensions normally used in mobile learning research ?.
- are the people ready to used mobile learning technology ?.
- discussions.
- the conclusion about the next direction after this literature overview.

This study is conducted to find the literature gap in mobile learning, specifically on the culture perspectives. The uniqueness of this research is to find the literature gaps for the direction in culture perspectives for mobile learning in Malaysia beyond conventional superior culture theory.

II. TYPE OF LEARNING STYLES

There are lots of learning approaches in mobile learning. However, one of the practical ways to practice mobile learning at higher education institutions is to use the experiential learning method combined with the student centred learning approach. The reason is due to the fact that the students will be more motivated and more engaging with the mobile technology tools throughout the learning process. Most significantly, students will be more interested in responding to the applications and the tasks that has been given [9].

A. *Interactive Learning*

In a constructivist learning paradigm, the facilitator encourages the students to discover the learning knowledge themselves. Likewise, the learners need to be given a good environment together with the conducive mobile learning facilities and tools to assist themselves. As the construction of knowledge involves cultivating the experience of learning, the experiential learning method has been used. In addition, it involves the learners, who are the main actors in the learning system [27]. The learning process in using mobile learning applications involves experiential learning which focuses on the students discovering the knowledge of what they have learned [9][10][22]. There are a variety of practices in learning and educational theory that fit in this practice are still highly experimented and researched. M-learning implementation at the education institution could use the appropriate educational theory that aligned with the usage of the mobile devices [9]. Furthermore, the university curriculum could integrate the m-learning to be incorporated with the subjects and learning objectives [30].

The example of mInteract, which has been implemented for teaching the subject of 'Accounting for Business', in 2008 at University Technology Sydney shows that the students engagement improved towards the subjects which were previously considered boring in delivery. In addition, the application has added interactivity compared to the old traditional way of learning which involved students listening to the teacher and consulted to notes or text books. Essentially, mobile learning has added the collaborative interactive environment where the students will listen and interact and so the teachers will also response with the students using the mobile learning technology and consulting to online notes and references, in addition to using set of text books [10].

The mobile learning technology has introduced significant improvement from the students' positive feedback [22]. The experiential learning process consists of action, reflection, abstraction, and the application where the teacher and student will engage in the transactions of learning [9]. An example: the mInteract application has provided a ground for reflective thinking to both teachers and students which improved the learning from traditional didactic approach to a new transactional and experiential way of learning. There are four mobile applications in this experiential study: M-fieldwork; interactive lectures using mInteract; mobile application development with PDAs; and lecture summary podcast which supports experiential learning [9]. Hence, the study shows that the subject variety could be improved by having a wide range of choices in mobile learning tools which is more relevant to the culture or society context of the subject being taught using mobile technology.

B. *Student Centred Learning*

The focus here is about student centred learning. The teachers as facilitators, while the students play the roles to ensure they will get the benefits from the new learning system. Nowadays, the learning process has shifted from the traditional teacher-centred to the student-centred approach. Students are the active participants and have autonomy to study at their own pace [2][29][42]. This approach is similar

with the interactive learning that has been incorporated with the mInteract mobile learning application which promotes student-centred learning approach [22]. The best learning approach should get the students motivated and engaged to the whole learning process. Next, educators' need to address their changing role, from a role as the channel of knowledge dissemination, to the role as a facilitator of learning resources [27]. The mobile learning technology has also successfully enhanced the students learning to understand more complex tasks in the education institutions in Malaysia [34]. Learning English has been improved from text books, whereby now the students could use the mobile learning application for their learning. In addition, the environment increases their confidence and cultivates an enjoyable learning environment. This study shows that mobile learning is an effective way of teaching and learning and brings more benefits to students in education institutions.

A project which is based on MOBUlearn project code IST-2001-37440 is a large, multinational, European-funded research, project which has identified mobile technology contribution in providing stimulating training exercises in undisturbed places and not in assembly halls or meeting places. This research combines the industrial partners, higher education institutions and brings the pool of skills from the technical design, implementation, pedagogy and evaluation. The project is also taking the user-centred approach and the students are the major participants [37]. Next, the scenarios build design and provide ideas about bridging the gaps from the provided requirement, pedagogy and technical aspects which have provided these attributes [37]: general requirements from scenarios generated by experts; theory of use from pedagogy experts; and field of studies from the content and context. There are many types of m-learning and also corresponding types of learning. Podcasting alone is not enough to penetrate education in the new millennium. On the contrary, research shows that podcasting could be another worthwhile m-learning resource tool. Therefore, similar research could also been done for large numbers of international students [28]. It is important that more investigation in m-learning is possible and yet to provide the richness in the context of high quality, collaborative, contextualized and active learning. Table 1 is about the different types of mlearning and the variety of learning styles.

TABLE I
COMPARISON OF M-LEARNING AND TYPE OF LEARNING STYLES
(NATAATMADIA & DYSON 2008, P. 231)

M-Learning	Type of Learning	Depth of Learning
Podcasting	Absorb/revise information from lecturer	Shallow ↓ Deep
Anywhere anytime access to diverse resources via PDAs & laptops	Content delivery or reflection on learning materials?	
Interactive classroom using personal response systems	Drill or interactive social learning?	
Communication via mobile phones	Collaborative learning	
M-fieldwork	Contextualized learning	
Multimedia data capture by students for student use: participatory simulations	Constructivist learning	

The framework above shows that there are many types of m-learning and also corresponding type of learning.

However, more mere needs to be more research into mlearning and learning styles, providing richness in the context of high quality, collaborative, contextualized and active learning including finding the local content with cultural value for learning.

III. IMPLEMENTATION ISSUES

Mobile usability is a new emerging area from the usability field where the human computer interaction researchers emphasis the psychological, the ergonomic, the organizational and the social factors higher satisfactory level will determine a type of appropriate mobile learning application [1]. Next, the usability and the accessibility are the prime concern throughout the implementation process, whereby usability guidelines should be standardized [30].

A. Usability

Usability guidelines are the major concern when dealing with the user interfaces of the software application. Nevertheless, many successful design interfaces need to integrate also cultural factors with the usability guidelines in order to adopt the mobile learning technology to cater specific users [23][24][25].

1) Usability Guidelines

Research on the usability guidelines for designing the mobile learning portal has already been conducted in Malaysia [8]. From the usability guidelines of the 'Mobile Learning Course Manager Portal', the user interfaces identified have three usability attributes of a mobile portal: visibility; consistency; and simplicity. Similarly, the usability factors by Nielsen (2007) stressed usability components and traits as it should be as shown in Table 2.

TABLE II
USABILITY TRAITS

Trait	Easy to Learn	Efficiency	Memorability	Error	Satisfaction
Easy	✓		✓		
Fast		✓			
Like					✓
Less				✓	

Using design guidelines are important and crucial to ensure users satisfaction. Furthermore, the most important thing here is to get the design tested by several users, at four to five users [12]. As a result, the system should comply with the usability guidelines.

2) Evaluation

More research needs to be done to quantify the theory of usability and also to relate to the formal instructional design strategies which involve mobile curriculum [8]. On the contrary, the cultural dimension factors needs to be argued, as people are not all uniform in thinking and executing their jobs and tasks. The quantitative approach in testing the application is also recommended [12]. Similarly, the qualitative research has also been conducted using 'Grounded Theory' with the 'Cultural Dimensions' model of Hofstede [5]. Most significantly, design guidelines and principles study should cover: usability; effectiveness; and

satisfaction [21][36]. As a result, a gap has been identified from the breadth analysis of the literature example: cultural factors with the evaluation factors such as satisfaction in the usability domain.

B. Reliability

Accessibility of mobile learning is another big issue, to ensure the implementation of mobile learning is going to be reliable. There is no point having the learning materials if the infrastructure and technology is unable to be supported. The students must be able to access the technology in their learning environment [30].

1) Cost effective in mobile learning

It is already known that one of the issues in mobile learning is the expensive cost of the device [22]. The purpose of mobile learning implementation and accessibility is made in such a way to prove that students could access the information cheaply or with minimal cost. However, different countries have different types telephone service providers, transmission technologies, different data charges and devices. Thus, to enable mobile learning efficiency, the cost of getting the mobile device, the mobile learning software and access line of mobile data should be as minimum as possible.

2) Accessibility

The mobile learning devices and the mobile learning environment obviously need to tackle the technical issues and to promote the seamless usage of Wireless Application Protocols to enable the education materials accessible to students [9][10][22][38]. On the other hand, there is also the usage of short message services (SMS) which to a certain extent need a good service infrastructure for message delivery [18][19]. Also, the availability context is referring to the users of the mobile learning technology [33].

A study in Malaysia about mobile learning has proposed an architecture which could be implemented and at the same will help the transmission of the content. For example, the university will be the host to the content either by building the server or subscribing to hosting services. The university will develop the content for the project. The content then will be sent by Learning Management System (LMS). The content via LMS could be assessed from various mobile learning gadgets [35].

In Malaysia, under the Ninth Malaysia Plan (2006-2010), the government has continued Universal Service Program (USP) especially to address the 4A principles, namely, accessibility focusing the issues and barriers posing connectivity; availability on content; affordability on equity and also is about affinity on usage pattern of telecommunication [32]. The Malaysian Communications and Multimedia Commission (MCMC) was assigned in managing the money for provisions in telecommunication, Info-desa and Internet-desa programme where ICT training, content application, tele-working, distance learning and information centre to access government information including downloading and uploading internet forms equity [32]. There are 4 majors problems determined on Universal Service Program (USP):

Telecommunication service providers have been losing motivation, the order of importance to carry the tasks that bring low return on investment (ROI).

- Firstly, lack of specific directions priorities and targets setting has prevented the service providers to identify the areas and communities for the Universal Service program assistance [32].
- Secondly, inadequate local contents especially from the targeted communities for low level of literacy and skills in English language [32].
- Thirdly, affordability for acquiring the hardware and software as well as developing content application especially rural communities with low income [32].
- Finally, one of the analysis results about accessibility of bridging the digital divide in Malaysia has shown that the usage of mobile phones has increased significantly from 26.9 percent in the year 2000 to 93.9 percent in the year 2004 from the rural areas [32].

IV. CULTURE DIMENSIONS

Aspects of culture could help to improve the usability of the mobile learning user interface. Current research deals with the usability aspects and cultural aspects of the web sites but not many research results could be found for mobile learning, on appropriate local culture. Sources for mobile learning interface usability that relate to the culture issues are also rarely to be founded. The popular and well known Hofstede cultural dimensions model brings 5 principles: power; self; gender; predictability; and time. On the other hand, the Hall cultural model is related to the high context and the low context of the content user interface. The qualitative studies about cultural influences on mobile data service design has been conducted [4], however, the researcher did not address clearly why they are adopting Hofstede and Halls in their research. Furthermore, the author did not address any pedagogy and learning concern on their research. The author's reasons for adopting Hofstede is merely because the model is popular and well known.

A. Hofstede's Model

Different cultures will look at different interpretations of meaning to a software application [11][13][17][23][25], therefore the cultural issues should address the application usability [26], where the improvement of services in mobile learning could also be achieved. Cultural theory could also provide direction to the designing and usability checking of the user interfaces. The four cultural dimensions by Hofstede are [14]:

Power Distance; Individualism versus Collectivism; Masculinity versus Feminine value; Uncertainty of Avoidance; and Long-Term versus Short-Term Association.

The study of the general model or connection between cultural behaviors and mobile data service of user-experience attributes for countries like Korea, Japan and Finland has been conducted [5]. In order to capture the relationship generalization, three cultural dimensions have been selected: Contextuality; Individualism/Collectivism; and Uncertainty Avoidance. This model integrates the 21 user-experiences attributes, which have been drawn from the data and the proposed model [6]. As a result, the study has

found that the correlation between cultural elements and user experience attributes of the mobile data services. Therefore, this model could help to guide the research for future practitioners to investigate based on the usability framework on the culture aspect of the specific countries [5].

B. Hall's model

Even though Hofstede's model has been favoured, the model is also the most inflexible and generalize culture at a national level. On the other hand, Hall's model which is more dynamic, explains the high context and low context of cultural influence in different perspectives [16], which is similar with collectivism and individualism that relates to design criteria of the user interface [24]. The impact of cultural factors shows with the behavior of students in an online course with regards to the influence of the high context learning cultures from low-context learning aspects [14]. The cultural dimensions researches are very limited to the organization structure and to the web site designs evaluation. The current research tries to map the cultural dimension qualitative study with Hofstede models which is a cliché. On the other hand, the Hall culture model has only concentrated on the web sites evaluation and not into mobile learning. The culture perspectives of mobile learning in Malaysia context have not yet been covered.

V. USER READINESS

Students are the most important users in adopting the mobile learning technology. A study at the University Petronas (UTP) Malaysia relates to how the users learn to use mobile learning in a private university [3]. Essentially, the mobile learning implementation will only be succeed if the requirement of the users are fulfilled [1].

A. Students willingness to adopt mobile learning

Research at UTP shows that the students are more accepting of the mobile technology [3][8]. The research therefore concentrates more on the mobile tools development rather than trying to understand the underlying usability problems and why some students are resistant towards mobile technology. Similarly, users also have their own behaviour and mental models on how the user interface should behave. Also, it leads to the users' preferences and readiness to use the mobile learning application [41]. If the mobile learning application is good, the users will be more engaging to use the application.

Students, as principals actors, choose to use mobile applications and devices based on the following criteria: secure [7]; easy to understand and easy to use [6]; and the students' learning task are achievable [40]. Next, another suggestion of research also emphasises that the mobile learning content design and context need to be adjusted to the cultural context of the students where the students belong to [20]. Finally, the mobile learning content should be able to attract and engage students and young people to adopt mobile learning [43].

B. Educators willingness to adopt mobile learning

Educators also play an important role in adopting mobile learning. For the educators, firstly, the infrastructure should be ready at the education institution [9] and the data

transmission access must be cheap to promote learning and teaching [22]. Likewise, teachers are now more ready to use the software which is culturally tailored for their own specific tasks. The teachers that use mobile learning technology need to be motivated and provided with a proper training [31]. Only, once the teachers have been motivated, the drop out or failure numbers of students could be reduced. Hence, the teachers are more willingly to adopt the mobile learning because they have been prepared with the skills and able to cope to work within the mobile learning environment.

VI. DISCUSSIONS

The research literature review could lead to opportunities and challenges which influence the cultural perspectives in mlearning. The existing challenges in mlearning from cultural perspectives covers in Malaysia: Lack of devices support for mlearning [22]; Inadequate of appropriate mlearning local culture content [32]; Lack of culture aspects in mlearning design content [3][8]; Lack of telecommunication wireless infrastructure in the rural areas [18][19].

In addition, there are opportunities in mlearning from cultural perspectives in Malaysia: development for variety types of mlearning cultural content; support from government to create mlearning cultural content; students motivation and engagement with potential mlearning cultural content [3][8].

VI. CONCLUSIONS

The state of art discussions have covered the learning approach, the implementation issues, the cultural and users' issues in mobile learning in an overview of the literature. The fact that the cultural dimension approach could improve the usability of the interfaces [23][24] are noted to a certain extent. Earlier overview on literatures about cultural issues are very limited to business organization structure; over generalizing themes and mostly focus on the web site [24][25] designs evaluation. The current state of art is highlighting the fact that cultural dimension Hofstede model in [25] somehow is a cliché and is a kind of stereotyping. On the other hand [16], the Hall culture model has yet concentrated on the web sites evaluation and not on mobile learning issues. Also in [3][4][5][8][11], lack of local cultural perspective which affecting the design is another issue. Consequently, the earlier cultural researches did not cover local cultural perspectives for Malaysia students in learning content and context. Hence, this literature overview has identified gaps that opens new opportunity to do research, which is more related to the mobile learning and culture perspectives in Malaysia students context.

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