

Overview of M-Learning and Applications of Devices in Taiwan

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Abstract-The purpose of this paper are to re-define mobile learning by analyzing previous study, to discuss mobile devices and its advantage and weakness in m-leaning, explore the digital content industry in Taiwan and use the four kinds of application about mobile leaning in Taiwan’s product market and to discuss those applications in the future. This is an explore study to build the m-learning framework in a collage accounting course.

Key word: m-learning, re-definition, mobile devices, Digital Content Industry in Taiwan

1. Introduction

We live in a world that technologies and the Internet changed the way people used to communicate, work and life, and this was called a new “technological” era. They are providing new choice of learning, offering a potential solution to meet challenges such as demand for more flexibility in delivery of education in terms of time, location, content, and form. Technology obviously transform the learning process, however, that process must be supported by new models of teaching and learning, and the students are expressing a greater need to be in charge of their own learning as well as to be involved in the decision making about how technology will be used in the learning process.

Education and training providers are increasingly using education technology through blends of e-learning and online learning in schools, colleges, universities, community centers, workplaces and in homes. Mobility and flexibility seem to be primary requisites for the adoption of technology. Students need to be able to learn when they want, where they want, what they need, and in a format suit to them. Obviously, technologies transform the learning process and that must be supported by new models of teaching and learning. The new leaning environment needs the support by government to build a necessary environment.

The purpose of this paper are to re-define mobile learning by analyzing previous study, to discuss mobile devices and it’s advantage and weakness in m-leaning, to explore the digital content industry in Taiwan and use the four kinds of application about

mobile leaning in Taiwan’s product market and to discuss those applications in the future. This is a explore study to build the m-learning framework in a collage accounting course.

2. Definition of mobile learning

Many authors are arguing that the growth of pervasive, ubiquitous, computing will have a large impact on learning and think the m-learning is defined as e-learning through mobile computational devices. In this section, we will use the previous literature to discuss the definition of different scholars. As described by Patten, Sánchez & Tangney[18] that many applications currently available merely leverage off the mobility of handheld devices to replicate or augment existing learning scenarios and the most appropriate use of handheld devices is to be found in the synthesis of appropriate use of the technology and sound educational underpinning. M-learning intersects mobile computing with e-learning; it combines individualized with anytime and anywhere learning [19]. Learning with a wireless and handheld device, the relationship between the device and its owner becomes one-to-one, always on, always there, location aware, and personalized [10]. Tatar et al. [20] defined the combination of e-learning and mobile computing is called mobile learning (m-learning) and promises the access to applications that support learning anywhere, anytime. Accounting of Ally, M. [2] the use of mobile devices in learning is referred to as mobile learning (m-learning): this is the delivery

of electronic learning (e-learning) materials on mobile devices such as personal digital assistants (PDAs), mobile phones, Tablet PCs, Pocket PCs, palmtop computers, etc. Georgiev, T. et al. [8] describe that distance learning, electronic learning and mobile learning offer methods, which decrease the limitations of traditional education. Historically the distance education has more than one hundred years of experience and traditions. Its main characteristic is the distance and time separation between teacher and students. The e-Learning offers new methods for distance education based on computer and net technologies.

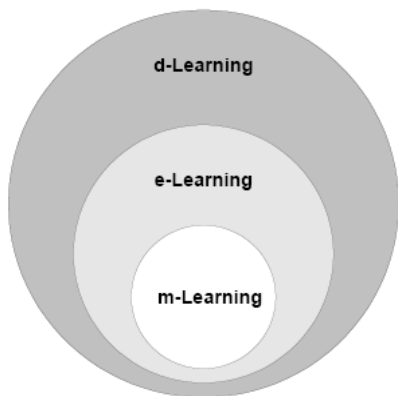


Fig.1. The place of m-Learning as part of e-Learning and d-Learning
Source: [8]

3. Mobile Devices

People often think mobile or wireless technologies are the same as mobile wireless technologies. But, actually, mobile wireless technologies are different from mobile or wireless technologies, because not all mobile technologies are wireless neither nor all wireless technologies are mobile. Mobile devices, such as cell phones and personal digital assistants (PDAs), are widely used in daily life. Due to the rapid changes in the PDA and mobile phone markets the devices used to deliver these applications vary widely. However, the two markets are converging. Smartphones or PDAphones now come with extra facilities traditionally associated with mobile phones and PDAs.

Many scholars argue that technology will play a much more significant role in education when it becomes more-human centered, less visible, and available to students whenever and wherever they need it[17]. Bull et al. claim that it is inevitable that every student will have a portable wireless device. In USA, the National Technology Leadership Summit, of teacher educator associations, state that “ubiquitous computing will be a widespread force in

schools by the end of the decade or sooner” [5]. Kim, Mims & Holmes[13] summary the pervious studies that about use of mobile wireless technologies in higher education, the most often use in mobile learning devices using in higher education are include web-enabled wireless phones(e.g. smart phones, web-enabled wireless handheld computers(e.g. palmtop, and tablet computers), wireless laptop computer and personal digital assistants(PDAs). In learning environments, mobile wireless computers, PDAs and handheld devices are used most often. Trifonova & Ronchetti [21] defined m-learning as e-learning though mobile computational devices. Mobile device mean PDAs and digital cell phone, but more generally we might think of any device that is small, autonomous and unobtrusive enough to accompany us in every moment in our everyday life and that can be used for some from of learning.

4. Re-definition of mobile learning to ubiquitous learning

One important field where mobile technology can make significant contributions is Education. The technology have offer new options for student - technology partnerships in learning. According the previous scholars defined m-learning as “e-learning that uses mobile devices”. One of the most important concept of mobile learning is “learning in anytime and anywhere”, so we want to challenge many scholar definition “learning by mobile devices” is not complete, it must be definition “learning by mobile and wireless devices”.

The place independence of wireless and handheld devices provides several benefits for learning environment like allowing students and instructors to utilize their spare time while traveling in a train or bus to finish their homework or lesson preparation.

We understand that mobile handheld computers and wireless connectivity at schools could enrich the e-Learning experience of students. Using mobile devices such as handheld computers connected to web servers in every wireless environment, students can truly experience the freedom and productivity of mobile handheld computing.

Experience of mobile learning in field study indicates requirements of ubiquitous learning concepts and applications. A ubiquitous learning environment allows students to learn with a PDA, Web Pad, Tablet PC or laptop, in indoor, outdoor, individual, and group situations [6].

5. The strengths and weakness about mobile devices in m-learning

BenMoussa [3] identifies mobile applications generally allow the user to control or filter the information flow and communication through the wireless handheld device; namely, these devices are usually personalized or individualized. Second, mobile connectivity improves collaboration via real-time or instant interactivity, regardless of time and location, leading to better decision making. These benefits can prove equally useful for improving the learning environment.

There are many studies to explore how handheld devices might more effectively support teaching and learning but there are also many scholars to bright out that devices' weakness in leaning. The key limitation of handheld technology for the delivery of learning objects is the small screen that is available for effective display. The smallness of the screen not only adversely affects the clarity, but it also negatively impacts on the acceptance and integration of this potentially useful technology in education [14] [7]. Albers and Kim [1] emphasize three specific issues that affect user access to information via handheld devices: (a) users' reading of text of a handheld computer screen is more difficult than on paper, (b) presenting graphical information is limited in the size and complexity of image, and (c) challenges for interactivity are increased due to the lack of keyboard and mouse and also the screen size limits space for interactive elements to be displayed. The small screen limited view raises challenges when reviewing the complex range and the many disagreements that exist in the literature on learning objects [7]. These problems of using portable devices for m-Learning were to query from Georgiev, T. [8]: (1)Small PDA and cellular phone screen sizes limit the abilities to display information.(2)The small keyboards of PDA and cellular phones make the input of the information difficult.(3)Today PDA and mobile phones have limited memory size.(4)There is necessary to regularly charge the mobile devices' battery.(5)Until now it is impossible to use applications developed for desktop PC in mobile devices.(6)There are difficulties to use multimedia elements (especially video) in cellular phones.(7)The prices for wireless communications are still high.

Although mobile phones have a relatively small display size, but it has addition to limitations in processing power, memory, and bandwidth, there are serious constraints on their input possibilities.

6. The Digital Content Industry in Taiwan

Taiwan's digital content industry includes digital

games, digital archiving, digital publishing, digital broadcasting, digital music, e-learning, mobile applications and services, computer animation, data streaming and video conferencing, interactive television, digital archiving, digital publishing, digital broadcasting, digital music, multimedia software products and services. According to the Digital Content Industry in Taiwan White Book , the digital content industry valued at NT\$288 billion in 2005, the industry is expected to grow at an average rate of 20% to reach a target of NT\$370 billion by 2006 [16].

Taiwan is one of world's highest mobile phone penetration rates. According to data released by the National Communications Commission (NCC), at the end of the second quarter of 2006, the total number of mobile phone subscribers in Taiwan, including 2G, PHS and 3G user at 22.8 million. This total gives a mobile phone penetration rate of nearly 100%. In other words, there is almost exactly one mobile phone number for every person in Taiwan [11]. The government's M-Taiwan (mobile Taiwan) initiative, which aims to put in place infrastructure to integrate cell phone networks, computer platforms, and Internet links through a national broadband network by 2008, is further spurring opportunities in this area. Facing the changes of the digital world, even if technologies require a heavy financial investment, the Taiwan government has actively worked to promote digitization through a number of initiatives in recent years.

7. M-learning products in Taiwan

If we use the "anytime, anywhere" to definition the m-learning, then there are so many kinds of product out of Taiwan can provide that kind function. Thus, we found that the Besta electronic dictionary which is the market sharp highest company, the Mebook is a company transform a traditional publisher to be a electronic book publisher, the OKWAP mobile phone company that combination with mobile phone and dictionary , and the GIGABITE that is a cell phone company, it combination with mobile phone and GEPT learning function.

7.1 The Besta – electronic dictionary

Inventec Besta Co., Ltd. [4] was founded in Taipei in 1989. As an independent subsidiary company of Inventec Group, Inventec Besta is responsible for the Inventec Group's self-owned brand "Besta" and emphasizes on the e-learning as its core competency. Inventec Besta focuses on the hardware and software of electronics dictionaries for the learning and

translation of English, Korean, Thai, Japanese, Malay, Arabic, and Indonesia are also included in Besta's product line. The "Besta" brand of electronic dictionaries has focused on sales to Chinese speaking territories around the world and Inventec Besta has successfully positioned its product as the leading brand of electronic dictionary on the market today.



Fig.2. A sample of BESTA Company's electronic dictionary.
Source : [4]

7.2 The MeBook - electronic book

The mobile e-book that integrates multi-media functions of texts, voices, images, pictures in a single system. Fitted with MeReader, special displaying software, Mebook provides all-directions of language-learning programs that guide you to read, to listen, to speak, and to learn. Mebook provides real-person oral pronunciations, enabling users to read and listen synchronically be it on PC or on PDA. The function of speed adjustment can enhance users' listening comprehension by adapting themselves to kinds of speeds. It can repeat a sentence or a passage according to their needs. Users can set an intended number of reading times to better understand a new or tougher course. The function of follow record enables users to compare their pronunciation with that of the teachers [15].



Fig.3. a Mebook sample for PC.
Source: [15]



Fig.4. the Mebook sample for Pocket PC.

Source: [15]

7.3 The OKWAP – cell phone with dictionary

OKWAP [12] is the Inventec Appliance Company own cellular phone brand for the greater Chinese market. Inventec Appliances now incorporates the "Mobile Learning" concept into OKWAP solution and introduces English Learning Smartphone and on-line English learning service support. OKWAP "Mobile Learning" is to address users' needs to learn more easily with superior access, better mobility, and up-to-date content. The OKWAP cell phones have a function of the English-Chinese dictionary inside, 90,000 of words inside.

The sample like:



Fig.5.A sample of OKWAP cell phone's dictionary content.

Source: [12]



Fig.6. the other sample of OKWAP cell phone's dictionary content.

Source: [12]

7.4 The GIGABYTE – cell phone with GEPT (General English Proficiency Test)

The GEPT is an English test in Taiwan for measuring people's English level. This cell phone company product out new g-re line of devices is being marketed as a mobile learning phone. The g-re cell phone has rich function. It is equipped with an unprecedented GEPT learning tool, providing a complete mobile life and learning. This function was co-developed with National Yunlin University of Science and Technology. Users can plug in the memory cards and enjoy a mobile English learning environment from basic to advanced level, and from listening to reading[9].



Fig.7. A sample of GIGABYTE cell phone’s GEPT learning tool.

Source: [9]



Fig.8. the other sample of GIGABYTE cell phone’s GEPT learning tool.

Source: [9]

In this study, the authors want to finger out that the application for learning devices like GIGABYTE cell phone, OKWAP cell phone even the Besta electronic dictionary are used to save learning material by memory cards, but we think these devices will have the wireless content soon. And we want bold to suppose that maybe any kind of device that can easy

wearable maybe have the wireless content like MP3 player.

8. Conclusion and future directions

To conclude, we propose that handheld devices will have a role to play in the way learner learn. The extent to which this opportunity will be taken will depend on how the technology is used. From our analysis of the current mobile learning research and applications, the mobile phones have a relatively small display size, but it has limitations in processing power, memory, and bandwidth, there are serious constraints on their input possibilities. Kim, Mims & Holmes [13] summarizes a list of colleges and universities that undertakes projects using different mobile wireless technologies in teaching and learning, which we can see: the most of schools assign the task though wireless LAN, PDAs and wireless computer.

In this paper, we have discussed the mobile devices using in the m-learning and conclusion from this paper that the small and easy to take along will be the best devices to learner, but the speed and the cost to use the 3G, SMS, MMS and so on is too slow and too expensive. According Luchini & Quintana[14]summarized from literatures the best practice in user-centered design of learning objects for educational applications on handhelds may be :

- (1) Text needs to be kept short and formatted in a way that provides meta-knowledge about information
- (2) Images should be reduced in size but not beyond the point of becoming meaningless
- (3) Scrolling should be avoided
- (4) Learning objects should be designed for a full screen presentation
- (5) Greater use of other modalities (in particular visuals) and interactivity over text should be employed as means of maximizing amount of educationally useful information presented on a single screen.

So in the next step, we will to do is to build up a mobile text bank about Accounting in a business college and this text bank will use the FlashLite to computing. Students can use their wireless devices to use the Web-based accounting text bank, anytime and anywhere. This website will auto to measure the screen size and decide the best show size in user’s mobile devices and learning website can currently support students to learn with any one of those learning devices.

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