

Significance of Ubiquitous Learning using Mobile Devices in Education System

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Abstract – The purpose of this article is description of Ubiquitous learning (U-learning) based on mobile devices mode. This paper discuss about how the implementation of learning between student and teacher of service provider in u-spaces done. The devices used include PDAs, mobile phones, portable computers and tablet PDAs. It presents how a system can become more capable student learning environment so that student can get student's learning done more efficiently. The development of a ubiquitous learning environment combines the advantages of an adaptive learning environment with the benefits of ubiquitous computing and the flexibility of mobile devices.

Keywords – Ubiquitous Learning, Mobile Devices, Personal Digital Assistant (PDA).

I. INTRODUCTION

Mobile learning or M-learning is become more popular as more and more households obtain an electronic device that offer portability and ease of use on a budget such as tablets and smartphones. Mobile learning offer teachers-and-students more flexible approach to learning. Students are able to use this technology in the classroom, it the study hall, in the gym or at home. The term m-learning or "mobile learning" has different meanings for different communities, that refer to a subset of e-learning, educational technology and distance education, that focuses on learning across contexts and learning with mobile devices. In other words, with the use of mobile devices, learners can learn anywhere and at any time.

The concept of ubiquitous learning (u-learning) has become a real possibility over recent years as those technologies inherent to the ubiquitous computing paradigm mature. A practical realization of this may be seen with ever increasing penetration of mobile devices into society and the increased availability and capacity of public telecommunication networks. Ubiquitous learning environment supports student learning using digital media in ageographically distributed environment. Various devices such as PDA and mobile phones are equipped with different hardware and software constraints. Hardware constraints can be used to describe device hardware capabilities such as platform, CPU speed, memory size, screen size and resolution. Software constraints can be used to describe device software capabilities such as operating system, browser, playable media type and resolution [1].

II. UBIQUITOUS LEARNING

Ubiquitous learning or u-learning is a new learning paradigm. It is said to be an expansion of previous learning paradigms as we move from conventional learning to electronic-learning (e-learning) and from e-learning to mobile-learning (m-learning) and now we are shifting to u-learning. Three of these major learning paradigms which include e-learning, m-learning and u-learning will be compared in the next section to provide further understanding of the learning concepts.

III. DEFINITION OF U-LEARNING

“U-learning is a learning paradigm which takes place in a ubiquitous computing environment that enables learning the right thing at the right place and time in the right way”. [2]

The main characteristics of ubiquitous learning are shown as follows [3]

Permanency: Students can never lose their work unless it is purposefully deleted. In addition, all the learning processes are recorded continuously in everyday.

Accessibility: Students have access to their documents, data, or videos from anywhere. That information is provided based on their requests. Therefore, the learning involved is self directed.

Immediacy: Wherever students are, they can get any information immediately. Therefore students can solve problems quickly. Otherwise, the student may record the questions and look for the answer later.

Interactivity: Students can interact with experts, teachers, or peers in the form of synchronous or asynchronous communication. Hence, the experts are more reachable and the knowledge is more available. **Situation of instructional activities:** The learning could be embedded in our daily life. The problems encountered as well as the knowledge required are all presented in the nature and authentic forms. It helps students notice the features of problem situations that make particular actions relevant.

Adaptability: Students can get the right information at the right place with the right way.

IV. MOBILE COMPUTING DEVICES

Mobile learning involving mobile handheld devices to support education/learning, notably including the following device types:

V. SMART-PHONES

There are various brand of smart-phone in the market such as Android phones, Blackberry, Apple's iPhone and Windows phones.

VI. TABLETS

Numerous brands of tablet now-a-days which are Android tablets, Apple's iPad, and tablets using the Windows.

VII. E-READERS

Amazon Kindle, the Barnes & Noble Nook, and the Sony Reader; note that the iPad and some other tablets can also function as e-readers.

VIII. DIGITAL MEDIA PLAYERS

Apple's iPod and iPod Touch, and MP3 players for listening to audio recordings of lectures/teachers (podcasting).

With so many kinds of mobile devices available today, it's no wonder that so many of us are less location-dependent than ever before. Mobile computing has come a long way, from the first laptop (in the year 1979) to the popularization of PDAs in the 1990s, to today's proliferation of smart phones, tablets, and pocket-sized mini computers. Here's what you need to know about the types of mobile devices that can help you get things done, wherever you are.

IX. LAPTOPS

Laptops are of course the de facto portable computing device, since they are designed to do everything a desktop PC can do, just from different locations. The smallest and most portable notebooks, ultraportables, weigh under 3 pounds (or under 5 pounds, depending on who you ask) and have screen sizes 13" or under. While laptops have the most computing power of the mobile devices listed here and they can be very travel-friendly, they are actually the least portable of your mobile device options; many people are even starting to replace (or supplement) using regular laptops with smaller, more mobile devices..

X. NETBOOKS

For some, even ultraportable laptops are too big. Netbooks, also referred to as subnotebooks, have a more compact form factor, with typically 10" screen sizes (though the first mass market netbook, the ASUS Eee PC had a 7" screen) and can weigh as little as 2 pounds. Netbooks are great because they're inexpensive, usually have long battery lives, and can do the most common (least processor-intensive) tasks most of us use our computers for, like surfing the Web, checking email, and using office productivity programs. They trade these

benefits, however, for less robust performance. Using your netbook for work is possible, however, depending on your tasks.

XI. TABLET PCs

The tablet, as a category of mobile computing devices, is less dependent on size or weight than on input - they are computing devices that take input from a stylus and/or touch screen. Early tablet PCs championed by Microsoft used pen-based computing and ran a tablet-customized version of Windows XP (Windows Tablet PC Edition). More recently, especially after Apple's introduction of the iPad, tablets are moving away from running the same operating systems as desktop and laptop PCs, running instead mobile OSes like iOS and Android.

XII. ULTRA-MOBILE PCs (UMPCs)

For traditional computing in the smallest package, ultra-mobile PCs (UMPCs) may be the answer. UMPCs are mini computers or, to be more precise, mini tablets (with touch screen/stylus/keyboard input options). With displays 7" and under and weighing less than 2 pounds, UMPCs are true pocket able devices and offer traditional or full-fledged operating systems like Windows XP, Vista, and Linux (some UMPCs, though, run Windows CE and other specialized operating systems). UMPCs offer broader traditional or general-purpose application support than smartphones, and a much smaller form factor than laptops or netbooks.

XIII. SMARTPHONES

Smartphones, with their combination of Internet and Wi-Fi access as well as cellular communication capabilities, are perhaps *the* devices driving mobility today, for both professional and consumer purposes. iPhones and Android smartphones in particular are showing rapid growth, soon to surpass feature phones. With smaller screen sizes than UMPCs, however, and many smartphones lacking hardware keyboards, working off a smartphone for extended periods of time can be limited. They are great communication devices, however, and for Internet surfing on the go; many business mobile apps also enable "anytime, anywhere" productivity.

XIV. PERSONAL DIGITAL ASSISTANTS (PDAs)

Lastly, there's the venerable PDA. Though PDAs like the Dell Axim and HP iPAQ are going out of favor, since smartphones can do what PDAs do plus add telephony and data, PDA users still abound and using a PDA has some advantages over smartphones. Many smartphones require, for example, a monthly data plan, whereas you can use a PDA at a Wi-Fi hotspot for free data connectivity. There's also a lot of business-oriented PDA software still available, since the earliest PDA adopters were business users. The downside, however, is that PDA development has come to a halt, and the demise of the

standalone PDA may just be a matter of time. As the earliest type of pocket-sized mobile computing device, though, PDAs have earned their place in the mobile device hall of fame.

XV. MOBILE LEARNING APPROACHES

Various approaches can be used in implementing mobile learning in schools:

Classroom

- Allowing students to use handheld computers, PDAs, smart phones or handheld voting systems (such as clickers) in a classroom or lecture room (Tremblay 2010).
- Allowing students to use mobile devices (such as a Pocket PC and tablet) in the classroom to enhance groupcollaboration among students and instructors.

XVI. CLASS MANAGEMENT

The mobile phone (through text SMS notices) can be used especially for distance education or with students whose courses require them to be highly mobile and in particular to communicate information regarding availability of assignment results, venue changes and cancellations, etc. It can also be of value to business people, e.g. sales representatives who do not wish to waste time away from their busy schedules to attend formal training events.

XVII. PODCASTING

Podcasting consists of listening to audio recordings of lectures. It can be used to review live lectures (Clark & Westcott (2007) and to provide opportunities for students to rehearse oral presentations. Podcasts may also provide supplemental information to enhance traditional lectures (McGarr 2009) (Steven & Teasley 2009). Psychological research suggests that university students who download podcast lectures achieve substantially higher exam results than those who attend the lecture in person (only in cases in which students take notes) (Callaway & Ewen 2009). Podcasts may be delivered using syndication, although this method of delivery is not always easily adopted (Lee, Miller & Newham 2009).

XVIII. OUTDOORS

- Learning in museums or galleries with handheld or wearable chronologies
- Learning outdoors (e.g. on field trips)

XIX. ADVANTAGES OF MOBILE LEARNING IN EDUCATION SYSTEM

(I) Adapting new ideas and methodologies

The education system we work in is not always known for its speed at latching on to new ideas and methodologies, but with mobile learning it is catching up-

quickly. The iPod Touch, for instance, is among the more popular mobile learning devices to hit classrooms across the country. This touch-screen device is easy for children to use, and comes with built-in Wi-Fi to access the Internet. However, it also has the ability to tap into the thousands of apps available at the iTunes store. For instance, you can use the dictionary and thesaurus on Dictionary.com, explore the world with Google Earth, or plot equations with Quick Graph. Download the Kindle app and turn your iPod into an e-reader, create your own stories with Story Kit, and find out about the latest space missions with the NASA app. These, and many others, are free downloads that are ideal for educators to use with their students in school. Using smart phones and tablet computers, students have easy access to knowledge. They use their devices as supportive educational tools. They now have access to diagrams, articles, essays and other academic information which can improve student performance in the classroom.

(II) Enrich learning process

The research that has been done on the use of mobile apps like these has been very promising. For example, a recent study funded by the Department of Education [4], looked at the link between learning, and the PBS Kids educational gaming app, Martha Speaks Dog Party. The study found that after children had used the app every day for two weeks, the vocabulary of Title 1 children between three and seven years old improved by as much as 31 percent. A similar study, conducted at the Abilene Christian University, centered upon the use of the Statistics 1 app. Students used it in and out of the classroom and remarked that they understood the content better, and were more motivated to do well, when using the app. The instructors agreed with this observation, and added that the students were also better prepared for classes.

(III) Benefit Students with special needs

One example of mobile technology for children with special needs is Proloquo2go, an assistive technology app available on iTunes. Students with autism spectrum disorders and others who may have difficulty speaking, can use the

XX. CONCLUSION

The advancement of computing and communication technologies have promoted the learning paradigms from conventional learning to e-learning, from e-learning to m-learning and now it is evolving to u-learning. U-learning aims at accommodating learners in their learning style by providing adequate information through mobile devices at anytime and anywhere as they wish for it. To promote a more effective application of u-learning, we have provided definitions and characteristics of u-learning and mobile devices. These definitions and characteristics will assist researchers in understanding the concept of u-learning and help application designers to plan and develop u-learning applications.

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