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Technological Transfer Through Ubiquitous Learning

Ebole Alpha F[1], (b) Awodele O[2]. and (c) Kuyoro S.O[3]

1. Computer Science Department, School Of Technology, Lagos State Polytechnic, Ikorodu Lagos, Lagos State, Nigeria.

[2,3] Computer Science Department, School of Computing and Engineering Sciences, Babcock University, Ilishan Remo, Ogun State, Nigeria.

ABSTRACT

The emergence of ubiquitous Learning creates new conditions for all working as education professionals and learning as students. We can use new technologies to learn old things in old ways, but the learner's relationship to knowledge and the processes of education have not changed in any significant way. It offers new ways by which learning can be created, stored, delivered and accessed. Learning occurs not just in classrooms, but at home, workplace, playground, library, buses, museum, and in our daily interactions with others. Also, learning becomes part of doing; we do not learn in order to live more fully, but rather learn as we live to the fullest. Education would be better promoted if some new technologies that make ubiquitous learning possible are identified.

KEYWORDS: Ubiquitous Learning; New Technology; and Education.

1.0 INTRODUCTION.

The term 'ubiquitous computing' describes the pervasive presence of computers in our lives. Personal computers and laptops have become an integral part of learning, work and community lives, to the point that, lack of access to a computer is regarded as disadvantaged, located as a 'have not' on the wrong side of the 'digital divide'. Many other devices are becoming more computer-like (in fact, more and more of them are computers or have computer power built in them): such as mobile phones, televisions, global positioning systems, digital music players, personal digital assistants, video cameras, still cameras and game consoles, to name a few. These devices are everywhere, getting cheaper, and becoming smaller and more portable, and they are increasingly networked. The pervasive presence of these machines is the most tangible and practical way in which computing has become ubiquitous to learning. PLATO, the world's first computer learning environment invented at the University of Illinois in 1960, through extensive research and development processes has resulted in a number of iterations over the past four decades.

Different aspects of pervasive computing includes but are not limited to the following:

Situated Computing: ubiquitous computing situates information processing, communications, recording and playback devices everywhere in human lives.

Interactive Computing: ubiquitous computing is interactive. Person connects with machine; machine answers on the basis of its programmed functions. The machine is 'smart' to the extent programmer supplied abstract variables.

Participatory Computing: ubiquitous computing spawns ubiquitous media, which spawns participatory culture. Here are a few the signs of our times: the centrally designed voice of experts, the print encyclopedia,

is supplanted by the tens of thousands of unnamed authors, anyone can post a video to YouTube. Unlike the old media, they are cheap, accessible and easy enough for anyone to do.

Spatial Computing*:* ubiquitous computing creates new senses of space.

Temporal Computing: ubiquitous computing also creates new senses of time. Ubiquitous computing brings together the 'now' and the 'whenever'. Now can be made sooner or later. Observing other people's timetables is increasingly replaced by calendaring for oneself.

Cognitive Computing*:* ubiquitous computing requires new ways of mental getting around, new logics of social navigation, new uses of the computer as appendage to thinking.

Intuitive Computing*:* as a matter of habit, ubiquitous computing becomes a deeply intuitive part of human life experience. Adults have managed to learn their way into the world of ubiquitous computing, or at least those on the 'have' side of the digital divide. They become fluent second-language speakers of the languages of ubiquitous computing.

The focus of this paper is to improve the Technological transfer of knowledge through Ubiquitous Learning.

REVIEW OF RELATED LITURATURE

Mobile devices for learning are limited by screen size, computational power, battery capacity, input interface and network bandwidth, and their applications must occasionally connect to a remote server to increase the efficiency and usability of a function. Many mobile applications have been developed to aid working, traveling, tour guiding and learning. According to (Trifonova & Ronchetti, 2004). U-learning becomes key element of national information technology strategy recently in many countries. Besides the u-learning context-aware related digital learning research also discussed and published widely in promotion of future technology learning vision (Chen et al., 2009; Chen et al., 2008; Chu, et al., 2010; Hwang et al., 2009; Hwang et al., 2008; Liu 2009; Peng et al., 2009; Wang, 2009). According different context familiarity, integrating GPS with multimedia u-learning, provide the u-learning environment in whole school area, not only in class rooms. (Tan and Liu, 2004). Another research team (Chen and Hsu, 2008; Chen and Chung, 2008; Chen et al., 2007), they developed personal PDA mobile vocabulary learning system by IRT (Item Response Theory), the system recommend suitable vocabulary for students learning in accordance with their level automatically. The National Cheng Kung University research team (Huang et al., 2012) developed u-learning system to assist students utilized ubiquitous technology developing learning material and media clips system indoor and outdoor adopted RFID and GPS. Taiwan scholars (Huang et al., 2010) has used the questionnaire survey to 147 college students for experiment teaching, the independent variables as of Knowledge Sharing Attitude, System Quality, Information Quality and Service Quality, exploit multivariate regression methods to assess students learning satisfaction in cooperation service platform, as a result, the four independent variables caused satisfaction of the cooperation service platform. Taiwan scholars (Tsai et al., 2012) has used the questionnaire survey to 117 college students for evironmental education, developed u-learning system adopted WiFi and RFID. Foreign countries Scholars (Sandberg et al., 2011), uses u-learning model for the study of animals characteristics in a zoo. Nine students in the university under the guidance by Nicolas (2012) using their own mobile phone recording a selected foreign language subject for 30 seconds video file weekly. This

study found that mobile video recording process is a useful activity. For years, researchers used to focus

on reading and writing skills, but now the feedback from video recording proceeding enhance students self confidence. (Zurita and Nussbaum, 2004, 2007) also try to use PDA and Wi-Fi communication technology for elementary school junior students learning Spanish and mathematics collaborative learning. Foreigner scholars de Jong, Spechtand Koper (2010) has used Apple iphone as mobile devices for Deutsch learning, they arranged 35 students to participated experiment teaching, to assess seven kinds of multimedia presentation method (including context filtration and content selection methods alternately), in order to acquaint the knowledge, evaluate the teaching course and system function appraise.

TECHNOLOGICAL TRANSFER

There are needs for us to explain the technology involved in the conceptual design of the ubiquitous learning environment. The conceptual design includes device adaptive and user model adaptive components. Briefly, the scenario shows that students can learn using Desktop PCs, laptops, PDAs and cell phones in the ubiquitous

learning environment. Students' learning behaviors through any learning device are recorded to tune the ''default'' student model in the learning website. Notifications and adaptive learning support messages are sent to learners by SMS. Students can then use the mobile learning devices or available computers to perform learning tasks immediately. Moreover, the learning system can recommend mentors that questioners can consult using a cell phone according to the constructed student model. Because students may use different devices when they are in different places, the learning system should support the presentation of learning materials and interaction with learners through all devices. This system fulfills the ''ubiquitous'' learning environment since students can receive instructions, notifications and recommendations on their cell phones. Students can connect to the learning system later to browse or interact using portable devices or desktop computers.

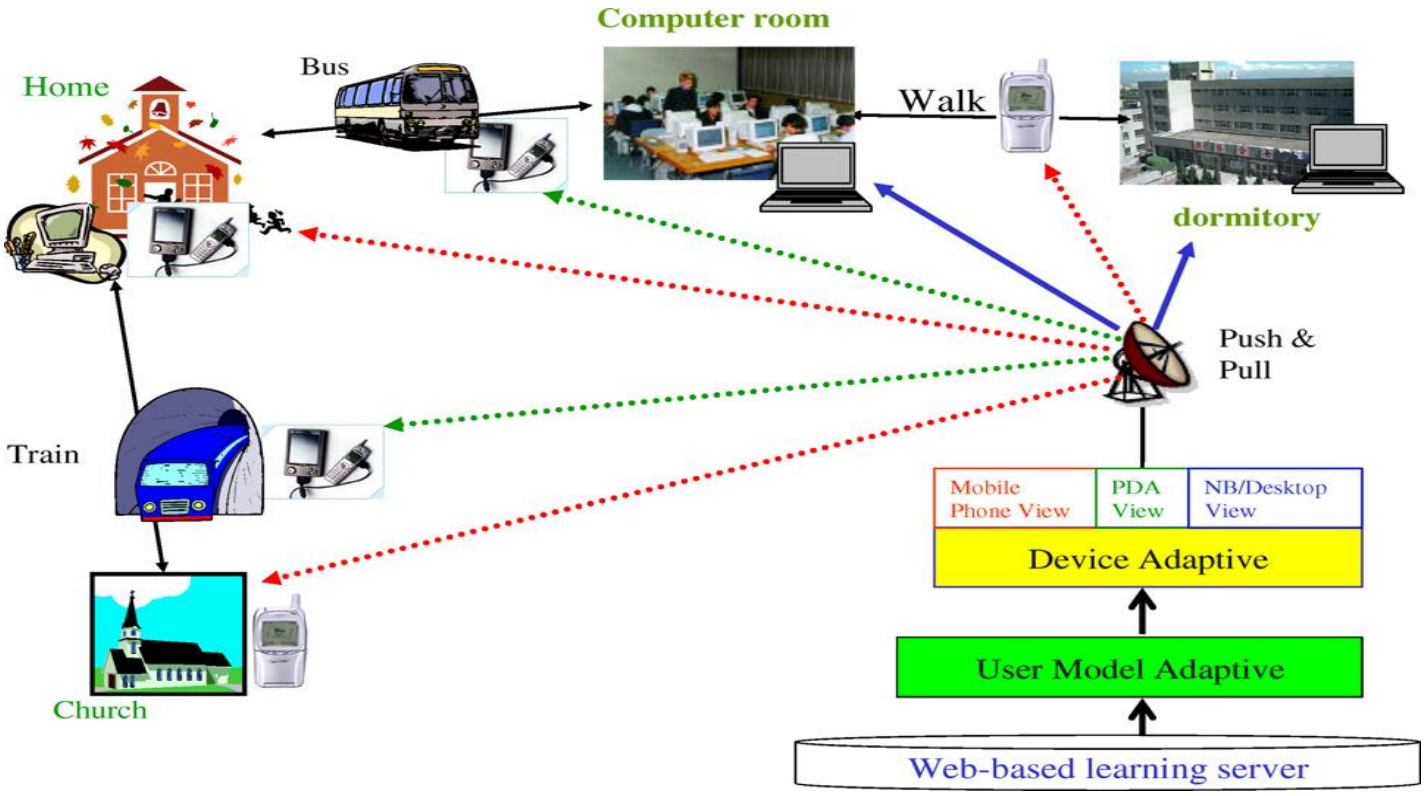


Fig. 1 conceptual design of the ubiquitous learning system.

Difference Learning Methods in Focus.

The Difference Learning Methods that have been put forward by researchers and discover that they overlap each other based on their strength. We propose five major differences, which are:

Permanency: The information remains unless the learners purposely remove it.

Accessibility: The information is always available whenever the learners need to use it.

Immediacy: The information can be retrieved immediately by the learners.

Interactivity: The learners can interact with peers, teachers, and experts efficiently and effectively through different media.

Context-awareness: The environment can adapt to the learners real situation to provide adequate information for the learners.

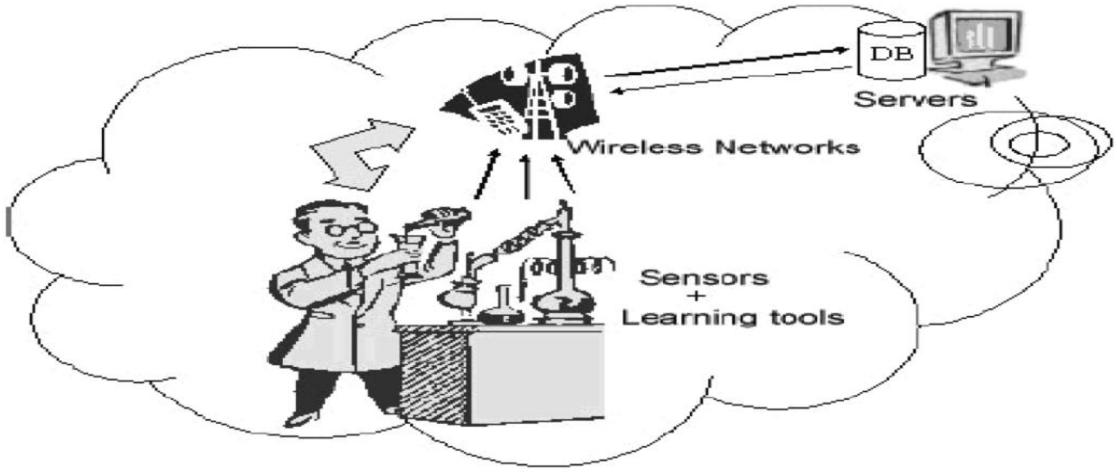
It is obviously indicated that *permanency*, *accessibility*, *immediacy* and *interactivity* are considered common to u-learning. We also agree that context-awareness is the major difference that distinguishes u-learning from others.

Criteria	u-learning	m-learning	e-learning
Concept	Learn the right thing at the right place and time in the right way.	Learn at the right place and time.	Learn at the right time.
Permanency	Learners can never lose their work.	Learners may lose their work. Changes in learning devices or learning in moving will interrupt learning activities.	Learners can lose their work.
Accessibility	System access via ubiquitous computing technologies.	System access via wireless networks.	System access via computer network
Immediacy	Learners get information immediately.	Learners get information immediately in fixed environments with specified mobile learning devices.	Learners cannot get information immediately.
Interactivity	Learners' interaction with peers, teachers, and experts effectively through the interfaces of u-learning systems.	Learners can interact with peers, teachers, and experts in specified learning environment.	Learners' interaction is limited.
Context-awareness	The system can understand the learner's environment via database and sensing the learner's location, personal and environmental situations.	The system understands the learner's situation by accessing the database.	The system cannot sense the learner's environment.

Table 1: Difference Learning Methods.

UBIQUITOUS LEARNING APPLICATIONS

The scenario of u-learning can be demonstrated in the diagram below. When a student gets into the lab or stands in front of an instrument, the devices will sense and detect the situation of the student and transfer the information to the server. All the related rules and procedures will be displayed to the student based on the information received.



Currently, ubiquitous learning is carried out in various educational settings and investigated in different directions such as ubiquitous pedagogy, classroom-centered u-learning mode, specific curriculum centered u-learning mode, faculty education for the implementation of u-learning, development standards of u-learning resources and development of u-learning instructional management system (Zhang, 2008; Bomsdorf, 2006).

CONCLUSION AND RECOMMENDATON

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. To promote a more effective application of u-learning, we have provided definitions and characteristics of u-learning. 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. Based on the definitions and characteristics, we have proposed our own u-learning definition and characteristics which incorporates the

previous definition. Through the use of these definitions and characteristics, we hope to further increase our understanding of u-learning.

The Technological knowledge of Ubiquitous Learning can be improve by the provision of more reduced digital devices with the improvement on the speed of processor, Memory, storage devices, reduced voltage consumption by DC battery as well as the Web browser software that can send and received HTML. It also involved the availability and improvement on the Wireless Network connectivity in line with the International Networking.

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