LEARN MATHEMATICS THROUGH UBIQUITOUS LEARNING

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ABSTRACT
Ubiquitous Learning (u-learning) is a new learning paradigm of the new social structure with mobile devices, sensor devices and wireless technologies. Smart classroom is one of the trending in school education in our government initiative to improve education standard in the country. With the advances of sensor devices technologies, ubiquitous learning could help the government in realizing the initiative. This paper discusses the prospect of implementing u-learning for higher secondary school students. It indicates significant and challenges and analysis of user perceptions on potential software applications through a survey done in higher secondary level school context. The authors propose the u-learning for mathematics by allowing the extension of technology in the traditional classroom in term of learning and teaching.

Keywords: Ubiquitous Learning, Mobile-technology, Teaching Mathematics, Sensor Devices

INTRODUCTION
U-learning introduces a new learning environment due to the emergence of Sensor devices, mobile devices and wireless technologies. It offers a new way to deliver learning objects into our daily life. This could be done by developing learning materials in small and consumable byte of format to its delivery medium. Liang Ting [1] stated that there are various mobile communication mechanisms that support u-learning such as voice communication, access of learning portal on the internet and learning through SMS. This clearly shows that U-Learning could be interactive with the convergence of audio, web and mobile technologies in one package. There are still a large number of schools and educational institutions do not use the available technologies even though those schools are equipped with high-technology equipments to support a new learning approach. There is some schools will use new curriculum for Mathematics and Science with objectives of smart classrooms to improve the learning quality, training, school organization and student presentation. In addition, the learner will develop the critical thinking, learning activities and creativities. Besides, one of the foreign Examination Board also reported that more than 35% of school student have fail the mathematics because of technology teaching lacks [2]. Teaching and learning mathematics have faced many challenges worldwide that either in delivery methods and student’s participations [3]. There are four main problems in the current learning systems in our country that inspires us to work on this project. The problems mainly dwell around the current learning environments, which is too rigid that limit the students’ potential in their learning processes. The problems are:
1. Heaviness of the textbooks used.
2. Student and teachers having hectic daily schedule.
3. Unnecessary and confusing e-learning function for school students.
4. High cost in commercialize system and desktop use.

According to a study done by Chong et al [3] presentation apparatus and courseware have been used extensively in teaching and learning the subject. The teachers still need more time to learn other advanced applications and how to integrate ICT tools in their lesson. One of the major barriers faced by mathematics teachers in our country during integration is insufficient of time on their timetable for projects relating to ICT. This problem could be solved with portable communication devices as their mobility allows teaching and learning to be more flexible and provides new opportunities for interaction [4].

In line with the knowledge work force emphasized by the government, it is crucial for everybody to instill the lifelong learning philosophy. U-Learning could be the best platform for everybody, at any ages to keep on learning. Short and small courses for distance learning could employ u-Learning in transferring the knowledge and providing an interactive yet valuable experience for the learners everywhere at any time. This paper presents the nation prospect of implementing U-Learning that includes significant and challenges of u-Learning, and user perceptions. This new learning approach is to make variety of choice and utilizes the advancement of today technology that embedded with the current way of learning. The framework of U-learning is focusing on learning mathematic in higher secondary schools. It includes mobile quizzes and progress tracking where students to attempt the mobile quizzes online, and teachers as well as parents to monitor the progress of the students.

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RELATED WORKS

Researchers [1, 4, 5] had agreed that U-learning is a new trend of learning paradigm with the emergence of sensor device, mobile device and wireless technologies usage among the learners. Even though some of the countries, especially the developing countries are still in the first phase or perhaps in the research and development phase in implementing this type of learning environment, Kyun Baek and Uk Cheong [6] and Barker, Krull and Mallinson [7] had proved that developing countries as well will soon catch up with this new learning paradigm. This shows that this new learning paradigm will evolve sensor & mobile devices with the rapid usage and ownership among the users. The usage of those devices, as an example, the hand phones could be extended to create the new learning environment.

M-learning will be a successful trend currently and in the future because currently, PDA and tablet PCs are more popular among users because of several factors [8]. One of the factor is that the mobile devices are inexpensive compared to PC. Besides that, the devices are mobile, durable and convenient for the worker on the go and lastly, the familiarity among younger users makes them an attractive mechanism for incorporating M-learning into the curricular. The evolution of learning paradigm from traditional classroom based learning and electronic learning had brought out the new learning paradigm based on mobile devices which is known as m-Learning [9]. A mobile technology have become pervasive, many researchers have questioned whether they can enhance learning experiences. Arguably, it could be thought that u-Learning is an utilization of mobile devices & sensor devices in e-Learning environment that picture a different skill on learning. This is because e-Learning and m-Learning are totally different from u-lerning in terms of its mobility and interaction among the students, as well as the teachers. The development of U-Learning is not intended to replace the
classroom or PC based (eLearning) learning content, but to strengthen and harmonize overall learning strategy. Meanwhile, Ubiquitous Learning offers another way to deliver content and to embed learning into daily life by developing learning materials in small and consumable byte of format which can be delivered through wireless network [1].

**CHALLENGES OF IMPLEMENTING U-LEARNING**

In every new technology, training and support are very important and U-Learning implementers need to take extra consideration about it. Learners and teachers, as well as the parents should be taught a lesson on devices function to fully utilize the u-Learning environment [13]. Any problems such as troubleshooting services should be ready anywhere and at any time if the stakeholders, in this case the learners, teachers and parents, faced any problems in using the technologies. Even though these are quite a many tasks, it should be taken extra considerations to ensure the stakeholders’ could benefits fully from this new learning environment.

The cost of the technologies and infrastructures in implementing u-Learning environment without any doubt will be very high. The cost of the mobile & sensor devices itself still being considered as expensive since there are prove that the devices price is reducing [12]. The term technologies refers to the programs or systems used to develop mobile based system while the term infrastructure refers to the wireless network hardware and devices used to create the framework of mobile communication.

**SIGNIFICANCE OF M-LEARNING**

It is human nature to be attracted to any appealing things and same goes to school students as well. Students at any age are attracted to fun and new activities using new devices. With the technology new learning concept could be applied and it is practical to implement this learning environment for that age group using the ever appealing mobile devices. They could be tempted to involve in the learning process dynamically if the medium is appealing to them in term of the devices’ weight itself which is multiple times lighter than their mathematics textbook.

Besides, everybody likes to stay connected with their devices at any time and at any place in order to ease their work. The confusion that happened by using the unnecessary functions on the current E-learning system can be solve by implementing learning processes using mobile devices and sensor technologies [11]. The nature of u-Learning which includes only necessary functions could make the students feel easy to use the system to its maximum to enhance their learning processes.

**DISCUSSION**

A survey has been conducted to investigate the use of wireless & sensor devices and to determine if higher secondary school students were ready for U-learning. 98 students from various schools volunteered to participate in the survey. The result shows the wireless devices that currently owned by the students that participated in the survey. In general, most of the students already have experience using the wireless learning devices. The survey shows, from the 98 respondents, 46% owned wireless learning devices such as phone, Tablet PC’s, PDA’s, etc. Based on activities engaged in by students, the result shows that they already participated in several of communication activities. About 115 of the respondents engaged in the following popular activities: chatting, downloading songs and playing game. The overall result has indicated their readiness for technology enabled learning. As well the survey result illustrates that more than 50% of the respondents are ready to start u-Learning, 12% are undecided and another 31% are unwilling to learn with the help of devices. U-Learning might not positively considered by some of the students because of the lack of knowledge about the devices.

**CONCLUSION**

The advancement in the field of Computer and Information Technology had broadened the horizon in the environment of education. From traditional based learning environment to electronic learning (e-learning) environment, then, the new way of learning, known as ubiquitous learning (U-Learning) had been implemented in developed countries such as the USA, UK and Japan. The content of U-
Learning could be more appealing to the students since it is the new concept and a new way of learning. U-Learning could be implemented in the future [10]. With the good framework being designed and the support of various organizations, the U-Learning environment could be realized successfully. The result of the survey shows that the wireless devices can be useful in learning mathematics as most of higher secondary school students already use them through many communication activities. Mathematics teachers should start implementing the U-Learning to allow students to independently explore the lesson taught with flexible access to the content and construct the effective teaching environment.

REFERENCES