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Ubiquitous learning in higher secondary education

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Abstract
The main aim of this work is to better understand and measure students' improvement, involvement towards the importance of ubiquitous learning in higher secondary education. This work clearly indicates that facilitating ubiquitous learning can improve the higher secondary education by enhancing ways of communication among students, teachers and supporting staff. The biggest advantage of this technology is that it can be used anywhere, anytime and its usage is easy access to a larger number of higher secondary students.

Keywords: learning, education ubiquitous learning higher secondary education

Introduction
Ubiquitous is a term referred (Weiser M 1991) [25] of a world where invisible devices would support people in everyday activities, offering boundless access to learning resources anytime and anywhere. In a higher secondary educational environment, teachers and students can take advantage of new trends in ubiquitous computing, employing ubiquitous devices and technologies in the learning space. Actually, young people carry mobile devices anywhere and anytime and enjoy playing with new gadgets (Cook DJ & Das S.K 2012) [5]. Educators and curriculum developers need to acknowledge this reality and adopt "Learning device gadgets on 21st-century tools for 21st-century learners" (Norris C & Soloway E 2008) [21].
An electronic learning (e-learning) environment is characterized by the dissemination of knowledge over the Internet. In e-learning, desktop or laptops computers, software tools such as e-tutoring and self-assessment and communication applications such as chat, forums and video calls can be used to support learning. A ubiquitous learning (u-learning) environment is a learning environment supported by ubiquitous devices such as Web Pads, Ultra-Mobile PCs, Tablet PCs, Personal Digital Assistants (PDAs) and smartphones. These devices can connect to Internet through wireless communication technologies. Mobile learning (M-learning) is considered either as a subset of e-learning (Mellow P 2005) [19] or an extension of e-learning (Motiwalla L 2007) [20]. M-learning is not just e-learning with mobile devices. Information is accessed from anyplace (spatial aspect of mobility), at anytime (temporal aspect of mobility) and also by anyone (individually and collaboratively) (Herrington A, Herrington J, & Mantei J 2009) [9].

Role of Ubiquitous in Education
The integration of ubiquitous in education has led to the emergence of ubiquitous learning (u-learning) (Kanagarajan S, Ramakrishnan S 2017a) [12]. U-learning environments integrate not only m-learning into e-learning environments (Casey D 2005) [4], but also pervasive learning environments that utilize invisible computers such as wearable computers, or sensors and computers embedded in objects (Kolomvatsos K 2007) [17]. While m-learning environments focus on mobility, pervasive learning environments focus on embeddedness. Therefore, u-learning integrates m-learning and pervasive learning to a high level of mobility and a high level of embeddedness (Ogata H & Yano Y 2004) [22]. U-learning environments are supported by mobile and ubiquitous technologies including mobile devices, embedded computer devices such as GPS, RFID tags and sensors, pads and badges, as well as wireless sensor networks. The another work (Hwang GJ Tsai CC & Yang S J H 2008) [11] clarified the confusion of the term "u-learning" and the related terms "m-learning", "learning with u-computing technology", and "context based u-learning". In particular, the definition of u-learning as "anywhere and anytime learning" is broader than m-learning, which demands mobile devices and wireless communication. Then, "learning with u-computing technology" is a special case of m-learning, since it emphasizes not only the usage of wireless communication but also sensor technology (Kanagarajan S, Ramakrishnan S 2017b) [13]. Finally, "context based u-learning" that employs mobile devices, wireless communications and sensor technologies in learning activities, can be considered a special case of learning with u-computing technology. Therefore, a u-learning environment is considered a superset of the other three types of environments.

Ubiquitous Learning in Higher Secondary Education
The classroom of the future will be based on the operation of Ubiquitous Systems (US) with a single logon, which include components that all are interrelated and interconnected. Main components of the US will support all the forms of learning: classroom and online courses, ubiquitous learning environments based on ubiquitous technologies, m-Learning, blended-learning, before, during, and after the lesson. Content

handling will be done online, and in real time. Other important components will be included in the US:

1. for supporting the collaborative development of learning content,
2. to offer/gain access to multimedia information,
3. to personalize and adopt content according to the needs, and
4. to use Social media for informal learning, communication, encouragement of participation, etc.

Ubiquitous learning is defined as the provision of education and training on various devices: Personal Digital Assistants (PDAs), smart phones and mobile phones (Kanagarajan S, Ramakrishnan S 2016a) [14]. One of the characteristics of u-learning is that it uses devices which students are used to carrying everywhere with them, which they regard as friendly and personal devices, which are cheap and easy to use, which they use constantly in all walks of life and in a variety of different settings, except education.

Advantages of Ubiquitous Learning in Higher Secondary Education

According to the researchers finding, there are several advantages inherent in ubiquitous learning:

- Helps to improve desirable learning in behaviour
- helps learners to improve literacy and numeric skills
- helps learners to recognize their existing abilities
- can be used for independent and collaborative learning experiences
- helps learners to identify where they need assistance and support
- helps to overcome the digital divide
- helps to make learning informal
- helps learners to be more focused for longer periods
- helps to raise self-esteem and self-confidence
- Comparatively more achieved with other technologies enabled learning

In various parts of the world ubiquitous learning developments are taking place at three levels:

- The use of ubiquitous devices in educational administration (Kanagarajan S, Ramakrishnan S 2016b) [15]
- Development of a series of 5-6 screen u-learning academic supports for students

Covering the problem of learners through ubiquitous learning. The common problems of learners can be summarized as follows

- Lack of personal contact and immediate instructor feedback that some learners prefer (Brown, 1996; Carr, 2000; Garland, 1993; McGivney, 2004) [2, 3, 7, 18].
- Sense of isolation (Galusha, 1997; Gibson & Graff, 1992; Heverly, 1999; Sweet 1983; Wojciechowski & Palmer 2005) [6, 8, 10, 24, 23].
- Requirement of pre-course orientation to help manage courses (Ashby, 2004) [1].
- Requirement of the tutor support counseling sessions during course of study (Ashby, 2004) [1].
- Improved information and formative advices (Ashby, 2004) [1].

Ubiquitous learning can provide helps in following dimensions

- The provision of course content to absent students
- The provision of feedback to absent students
- The provision of student support services to absent students
- Links to the WWW and other resources
- Student-to-student interactivity
- Student to teacher and institution interactivity.

Conclusion

Ubiquitous technologies are perceived by the higher secondary students in this work to be good in improving communication and learning. Ubiquitous technology devices such as mobile phones, PDA's, Tablet PC, however, do hold tremendous potential of flexible mode of communication, which can be strategically used to support and improve student retention. Ubiquitous technologies do appear to have a great future in developing countries. Indeed, ubiquitous devices such as tablet PC's, kindle etc. are one of the less expensive, most accessible and popular media among students of all ages. Flexible and low cost mobile technologies can be used to maintain and enhance contact with students and teachers, and, by arranging training effective use can be enhanced in ubiquitous learning.

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