Rs. 25.00
ISSN-0566-2257

University News

A Weekly Journal of Higher Education

Association of Indian Universities

Vol. 55 No. 51 • December 18-24, 2017

Special Issue

on

Designing Higher Education Institutions: Role of Digital Initiatives

on the Occasion of

AIU South Zone Vice Chancellors' Meet–2017

at

University of Calicut, Calicut

Ubiquitous Learning: Transforming Knowledge in Higher Education through Integration of U- Technologies

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Higher education is an area in which generation of knowledge takes place in different styles, forms, techniques and modalities. Integration of technology was seen as an essential component of learning in the early part of 20th century but nowadays, it is not integration which promotes learning but it is technology itself generates which learning in many ways. Various e-learning systems have been developed in the past decade; the majority of these systems are either teacher centred or repository centred.

Teacher centred or repository centred e-learning systems reflect actual learning scenarios in which teachers act as the content producers while students act as the content consumers. M-learning is often thought of as a form of e-learning, but it would be more correctly defined as a part, or sub-level, of e-learning. They believe M-learning is a new stage in the progress of e-learning and that it resides within its boundaries.

The ubiquitous learning environment provides an interoperable, pervasive, and seamless learning architecture to connect, integrate, and share three major dimensions of learning resources: learning collaborators, learning contents and learning services. Ubiquitous learning is based on ubiquitous technology. The definition and characteristic of U-learning is not unique. There are different views in defining and characterizing U-learning.

Higher education institutions have invested significantly in digital technologies for learning and teaching. However, technologies provided by higher education institutions have not been universally successful in terms of adoption and usage. Our increasingly globalized world is driven by shared knowledge, and nowhere is that knowledge more important than in higher education. Now more than ever, there is a demand for U- technology that will assist in the spread of knowledge through customized, self-paced, and on-demand learning. International education systems provide a perspective on the need for U-learning through the integration of U-technology in higher education.

The integration of technologies in the higher educational setting has great impact nowadays. With the emergence of U-technologies, the digital nature of learning environments has changed the face of higher education. The integration of these U - technologies into classroom instruction is essential for promoting student learning. In the context of higher education, educators should be up to date; employing latest U - technologies in order to deliver knowledge according to student learning style.

Ubiquitous learning environments, equipped with ubiquitous devices and exploiting ubiquitous technologies can encourage student's involvement in the learning process, without requiring student's active attention. U-learning can relate learning to the learner's situation and increase effectiveness and efficiency of education system. It provides facilities for remote teaching and also to support the student with additional material which will be available anytime and anywhere, using mobile devices. It is apparent that these features are not far from being widely used in the near future, as mobile devices gain in power and processing capabilities and as their price is becoming lower.

The Evolution of Ubiquitous Learning

The development of mobile learning and the gradually increasing range of opportunities to develop educational processes anytime anywhere, ultimately led to a new learning approach called ubiquitous learning (Peng et al. 2009). Weiser first introduced the notion of a ubiquitous computing environment in 1991, defining ubiquitous computing as an environment where the computer is integral yet entrenched into the background of everyday life (Yahya, Ahmad, and Jalil 2010). Applying this concept to the field of education, ubiquitous learning (U-learning) encompasses learning in an environment where "all students have access to a variety of mobile computing devices, whenever and wherever they need them" (Van't Hooft et al. 2007). In a ubiquitous computing environment, users can learn

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to use available technology so well and so frequently that they are not even consciously mindful of its presence (Bell and Dourish, 2007).

Ubiquitous Computing

Ubiquitous computing can be considered as 'a new trend of Information and Communication Technologies' (Sakamura & Koshizuka, 2005). Here computational learning has become accessed to all at their will. The term `ubiquitous computing` was coined by late Mark Weiser (1952 – 1999), described as "the calm technology, that recedes into the background of our lives". This allows people and the environment with the combination of various computational technologies to exchange information and services at anytime and anywhere (Weiser, 1991). The learning generated in one place can be transferred and used in places everywhere. This can be treated as a latest computing technology which is all pervasive in terms of knowledge generation.

Ubiquitous Computing Technologies

Computing and communication technologies are among the key technology that is forming ubiquitous computing. Ubiquitous Computing can occur using any device, in any location, and in any format.The growth in using computing technologies and wireless communication technologies now a days help out to support the expansion of ubiquitous computing. The underlying technologies to support ubiquitous computing include Internet, advanced middleware, operating system, mobile code, sensors, microprocessors, new I/O and user interfaces, networks, mobile protocols, location and positioning and new materials. In recent years, a variety of computing and communication technologies have been developed, such as sensors and actuators, RFID (Radio Frequency Identification) tags and cards, wireless communication equipment, mobile phones, PDAs (Personal Digital Assistant), and wearable computers.

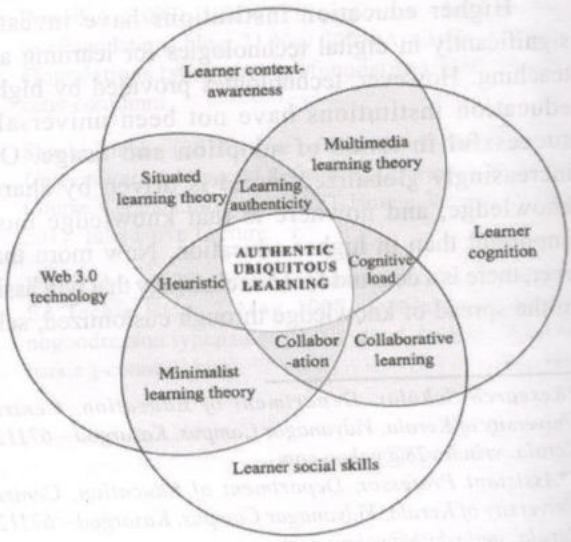
What is Ubiquitous Learning (U-Learning)?

Ubiquitous learning or U-learning is a new learning paradigm. It is an amalgam of electronic (e-learning), mobile-learning (m-learning) and U-learning takes place independent of time and place. That is, Ubiquitous learning (U-learning) refers to a ubiquitous learning environment that enables individuals to conduct learning activities in the right place and right time.

U- learning: Conceptual Framework

The theoretical construct has been given by many researchers in different ways. The study done by M.L. Koole, adapted a framework in the Rational Analysis of Mobile Education (FRAME) model has detailed about the integration of four different domains like awareness on learner context, learner recognition, learner social skills and web 3.0 technologies in learning. The Learner context-awareness is the actual knowledge of the learner about the circumstances in which the learner wants to perform with the resources available at that point. Learner cognition is the intellectual capacity of the learner to react in situations where learner feels comfortable. The Learner social skills are the ability to adapt to the learning environment. The Web 3.0 technology comprises of mobile blogs, mobile augmented reality, and mobile tags. The intersection between these four aspects is defined as the learning theories and approaches that are integrated are namely, situated learning theory (for investigation of context-awareness), multimedia learning theory (to study learner cognition), minimalist learning theory (to study Web 3.0 technology), and collaborative learning (to investigate learner social skills). The overlap between these learning theories and approaches are further defined as constructs and are measured, which are authentic learning, cognitive load management, collaboration and heuristics. The intersection between all the aspects results is the goal of the study, which is 'authentic ubiquitous learning'.

Fig. 1: U- learning Conceptual Framework Adapted from M.L. Koole (2009)



Features of Ubiquitous Learning

- Permanency: The information remains permanent 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: It involves collecting information in a surrounding or condition at any given time and matching behaviours accordingly. Context may be applied more flexibly with mobile users, especially with users of smart phones.
- Situating of instructional activities: The learner needs to be aware of the problems encountered that match particular actions relevant. Situating of instructional activities is a part of context - awareness characteristic.

Types of U-learning

Some types of U-learning are:

Mobile Based Learning (MBL)

With the abundance of knowledge the Internet provides, mobile phones become an invaluable pathway for that knowledge. Mobile learning is considered as any educational provision where technologies used are handheld or palmtop devices. It provides faster access to learning resources, news information, etc.

Technology-Based Learning (TBL)

Learning in which teachers use electronic technology to teach and learners learn with aid of it is referred to as Technology-based learning (TBL). It includes Internet, intranets, satellite broadcasts, audio and video conferencing, bulletin boards, chat rooms, webcasts, and CD-ROM. It also corresponds to terms, such as online learning and web-based learning which include learning via the Internet and computer based learning with the use of computers.

Web-Based Training (e-learning)

Web-based learning or e-learning encompasses the use of electronic devices (computers, tablets, or phones) to deliver educational or training content to learners at any-time .There are two kinds of Web-based training: Synchronous and Asynchronous (self-directed, self-paced).

i. Synchronous e-learning

Synchronous learning refers to a learning event in which a group of students are engaging in learning at the same time. It involves online studies through chat and videoconferencing. It is like a virtual classroom which allows students to ask, and teachers to answer questions instantly, through instant messaging at the same time. These online courses allow students and their teachers to interact during the course. Synchronous leanings are as follows: Internet telephony, Web conferencing, online lectures, and Audio/video conferencing, teleconferencing, MOODLE, Coursera, Edex, etc.

ii. Asynchronous e-learning

Asynchronous learning can be carried out even when the student or teacher is offline. E-mail and messages posted on community forums are perfect examples of asynchronous e-learning. In such situation, it helps the students to learn at their own pace and use the internet as a supportive tool. Asynchronous e-learning are the following: Self-paced courses taken via internet on CD-ROM, Stored audio/video level presentations or seminars. Asynchronous learner can generate self pace learning, repetition learning and can be taken for evaluation of the knowledge generated even in the absence of the facilitator.

U-learning in Higher Education

U-Learning is getting widely integrated into higher education instruction as the stakeholders are aware of the pedagogical and economical benefits of using advanced technologies. Learning management systems like MOODLE provide instructors with tools for uploading content items, facilitating communication and managing the learning. The use of such systems brings about behaviour modification of learners in higher education sector. Universities provide instructors and students an atmosphere to facilitate U- learning. But it is important to understand how these systems are being used in practice. Applying U-learning in higher education system can enhance student's online activity in university courses. Instructors may use this knowledge to benefit their teaching and to promote their students. Education researchers should take necessary actions to promote U-learning. University policy-makers might deepen their knowledge of the cost-effectiveness ratio of these systems. Bringing together all these points of view will help to transform knowledge in higher education and in making them more efficient for all.

Conclusion

U- Learning environment enables people learning at any time and any place. But the fundamental issue is how to provide students right information at the right time in the right way. The issues of right time and right place learning in a ubiquitous computing environment are tackled in this study. Learning is an aspect of living not of place. We have always been able to learn in diverse settings other than the formal classroom, and often in a more pleasant, memorable, and useful way. Ubiquitous learning serves to fulfill the need of learning with the affordances of new U-technologies. This growing trend toward ubiquitous computing or pervasive computing using the power of networks has opened the door for learners and instructors to access the world's knowledge from almost anywhere and at any time. Thus the use of u-technologies offers various opportunities for transforming knowledge in higher education. In light of these developments, educators must update learning and ensure that their pedagogical theories are aligned with the active and collaborative nature of such technologies.

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UNIVERSITY NEWS 55 (51) December 18-24, 2017 Regd. No. RNI-7180/1963
Published on Monday: 18.12.2017 No. of Pages 88 including covers Posted at LPC Delhi RMS, Delhi-6 on Tuesday/ Wednesday every week

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**All speaker's names are in alphabetical order.* Many of the speakers have confirmed participationwhile others are in the process of doing so. The final list will be published in due course.*

Sessions

DAY 1 10th January 2018	Globalization of Indian Higher Education – Drawing the Roadmap • Indo-US Vision 2030 • Indo-Europe Vision 2030 • Indo –Australia Vision 2030 Teacher to Teacher Connect Discussion on Opportunities to Collaborate
DAY 2, 11th January 2018	Value- based Universal Education: Foundation for World Peace Quality in Higher Education: Truth and Reconciliation Use of Technology in Education – Impact Vs Impediment Teacher to Teacher Connect Discussion on Opportunities to Collaborate
DAY 3 12th January 2018	Use of Technology in Education – Impact Vs Impediment Teacher to Teacher Connect Discussion on Opportunities to Collaborate Educating the Educators Economics of Education Valedictory Session

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National Teachers' Congress Foundation (Regd. No. IN-DL 495697972347210)

Edited, Printed and Published by Dr. Amarendra Pani, on behalf of the Association of Indian Universities, AIU House, 16 Comrade Indrajit Gupta Marg (Kotla Marg), New Delhi-110 002. Phones: 23230059 (6 Lines). Fax: 011-23232131, E-Mail : sgoffice@aiu.ac.in, advtun@aiu.ac.in, publicationsales@aiu.ac.in, subsun@aiu.ac.in (for subscription), unaiu89@gmail.com, universitynews@aiu.ac.in, Website: http://www.aiu.ac.in
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