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u-Learning, m-Learning and e-Learning: An Introduction to New Age Learning Methods

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Abstract

This paper attempts to compare between u-learning, e-learning and m-learning. E-learning provides organisations with the tools to integrate readily available technology to create a holistic and continuous learning platform. With the support by today's mobile technologies to e-learning within d-learning (distance learning) concept, the notion of m-learning provided technological progress in education. Educational technology is constantly evolving and growing, and it is inevitable that this progression will continually offer new and interesting advances in our world. The instigation of ubiquitous media for the delivery of education is another new emerging approach.

Keywords

e-learning, m-learning, u-learning, mobile learning, ubiquitous learning

Introduction

The development of technologies and technological devices has progressed rapidly in education field in such a way that traditional education methods have left their importance to technological education methods. This progress revealed the notion of e-learning. E-learning environment learners interact with learning materials, their instructors and other learners in various locations often at various times using network technologies.

With the support of today's mobile technologies to e-learning within d-learning (distance learning) concept, the notion of m-learning provided technological progress in education. The development of mobile technologies and the need for movement of the technology in education to new dimensions have

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revealed the new notion m-learning. M learning (mobile learning) is a part of e learning. It is the learning or delivery of content that is facilitated by the use of portable technologies such as mobile phones, PDAs or i-pods.

Educational technology is constantly evolving and growing, and it is inevitable that this progression will continually offer new and interesting advances in our world. The instigation of ubiquitous media for the delivery of education is another new approach now emerging. In the education field, "ubiquitous computing allows us to envision a classroom in which the teacher remains focused on his or her field of expertise while still utilizing technology to enhance student learning" which led to the development of u-learning.

e-learning

e-learning is any type of learning i.e., enhanced by electronic communication online using the latest information and communication technologies. It is the delivery of education, which includes activities related to instruction, teaching and learning through various electronic media such as internet, intranet, extranet, LAN, WAN, MAN, satellite TV, video or audio tape and other tools such as CD-ROM, DVD, floppy, hard disk, pen drive, and personal digital assistants. e-learning refers to electronically supported learning and teaching of any kind. Any form of learning in which digital communication, electronic devices or the internet is used to support the learning process might be described as a form of e-learning, which also comprises education technology.

e-learning includes such processes as computer based learning and internet based learning, but it is important to remember that it does not necessarily require either a computer or an internet connection but only the use of electronics. So learning a language using a CD Rom, for example, or watching an educational television program would also count as e-learning. However, the advent of the internet was the real catalyst for many important advances in e-learning and the term is now used to describe internet-based activity such as collaborative online learning or interactive educational resources.

In e-learning, online information is delivered via dedicated web based hyper text system on the Internet. To produce and manage a comprehensive on- line education service, following components are needed.

a. Human resources
b. Technical resources
c. Information resources
d. Learning resources

Features of e-learning

1. It provides an integrated teaching and learning environment

2. It offers a large amount of information than traditional learning environment
3. It contains a systematically organized academic environment
4. It facilitates more interactive and collaborative ambience among the learners and mentors
5. It allows learners to choose learning content and tools according to their varying interest, need and skill levels
6. It accommodates multiple learning style using a variety of delivery methods geared to different learners
7. It opens a broader learning opportunity and eliminates the geographical barriers
8. This supports the generation of academic reports and provide storage facility

Tools for the e-learning system

- Internet Chat, Servers, Net meeting.
- VRML, Audio Visual Effects
- Web, HTML, HTTP,CGI
- Broad Band, High Speed Network, VSAT, ISDN, WAN, LAN, Wi-Fi
- Digital Library, virtual Library, E- book, CD-ROM
- Latest Computers with Multimedia, Network Support

m-Learning

m-learning is an abbreviation of mobile learning, which means learning using portable devices that allow the student to learn in different environments. m-learning is used for learning that can be delivered and supported entirely by mobile technology.

Nowadays the mobile phones are not only made for verbal communications but also provide various functions which were previously offered by computers only. m-learning is defined as any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantages of the learning opportunities offered by mobile technologies.

m-learning uses using handled devices and mobile phones in learning, training and job aid. The real use of m-learning can be achieved through cell phones and smart phones. m-learning involves learning anywhere with no need to physically connect to an outlet. SMS may be one of the most common wireless applications that are used with mobile wireless phones to support teaching and learning. With SMS, professors and students can send and receive text message to and from most modern mobile wireless phones.

Features of m-learning

1. The learner can immediately retrieve information through m-learning.
2. When the learners need information, it is available at anywhere and at anytime.
3. The learners can interact with teachers, peers and experts efficiently and effectively through different modes.
4. The equipment involved in m-learning (mobile devices) is cheaper.
5. It involves the GPS technology which can provide location depend educator.
6. One of the most unique characteristics of mobile learning is that it should be delivered in short 'nuggets' rather than large units of information.

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. According to Lyytinen & Yoo (2002), "the evolution of ubiquitous computing has been accelerated by the improvement of wireless telecommunications capabilities, open networks, continued increases in computing power, improved battery technology, and the emergence of flexible software architectures". This leads to u-learning that allows individual learning activities embedded in daily life

Ubiquitous learning (u-learning) is equivalent to some form of simple mobile learning, e.g. that learning environments can be accessed in various contexts and situations. The ubiquitous learning environment (ULE) may detect more context data than e- learning. Besides the domains of e -learning, u-learning may use more context awareness to provide most adaptive contents for learners. u-learning involves learning in an environment where all the students have access to a variety of digital devices and services, including computers connected to the internet and mobile computing devices, whenever and wherever they need them.

A ubiquitous learning environment is any setting in which students can become totally immersed in the learning process. So, it is a situation or setting of pervasive or omnipresent education or learning. Education is happening all around the student but the student may not even be conscious of the learning process. Ubiquitous Learning Materials (ULM) is defined as learning materials that may be transferred to mobile devices via cable or wirelessly and be operated in these mobile devices. These materials can be videos, audios, PowerPoint presentations, notes, or any kind of learning materials that can be transferred to and worked on mobile devices.

Features of u-learning

1. Shifts the classroom from a traditional to non-traditional context. It also changes the role of the teacher from being the primary source of information to facilitator and supervisor, and it allows the teacher to pay equal attention to every student.
2. It also gives the student the opportunity to access instructional materials at different times from different locations.
3. Prepares and encourages students to become lifelong learners.
4. Ubiquitous learning environment enables students to become lifelong learners in that they are able to use multiple devices to access and search for knowledge and information while developing their search skills.
5. Ubiquitous learning environment is free of stress.
6. Ubiquitous learning environment is a safe environment for learners to interact with each other and with instructors.
7. Provides several representational modes. ESL/EFL materials are crucial in the learning process. Teachers choose and create ESL/EFL learning materials to make the learning process more effective.
8. The Ubiquitous learning environment offers learners and teachers many cost-effective opportunities to present knowledge.

Figure 1 illustrates the conceptual shifts from e-learning to m-learning then to u-learning.

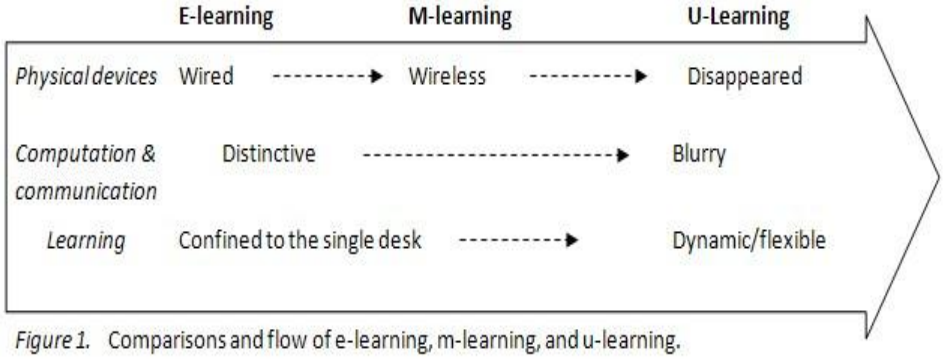

Figure 1. Comparisons and flow of e-learning, m-learning, and u-learning.

e-learning, m-learning and u-learning

The term e-learning represents wide range of applications and processes that is web based learning, virtual class rooms and digital collaboration where as m-learning is a part of e-learning. e-learning is a broad concept including wide range of applications where as m-learning is a narrow concept. In the case of m-learning various electronic gadgets and computer software are used to enhance learning process. The main difference is that m-learning is less restrictive because m-learning allows learning to occur anywhere and at anytime while in e-learning can

be limited by mobility. 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

e-learning covers a wide range of computer technologies including graphics, multimedia and animation where as in m-learning it is quite difficult to do job on graphics. The memory or storage capacity of e-learning is unlimited whereas in m-learning memory capacity is limited. In the case of m-learning, when using wireless networks, bandwidth may degrade with increasing users. Where as in e-learning there is no such problem. e-learning is a type of learning that is offered in a formal and structured manner where as m-learning is defined by learning that is more informal, opportunistic, private, situational and unstructured. e-learning has the potential for even greater impacts than e-learning. e-learning includes wireless laptop, but the full objectives of m-learning cannot be achieved unless we use the smart phone and mobile networks. This is due to the fact that mobile phones and smart phones are accessible anytime and anywhere. Through m-learning we can collect responses in a very short period, but in e-learning we need more time to do it. e-learning has the potential for even greater impacts than e-learning.

Ubiquitous learning is characterized by providing intuitive ways for identifying right collaborators, right contents and right services in the right place at the right time based on learners surrounding context such as where and when the learners are (time and space), what the learning resources and services available for the learners, and who are the learning collaborators that match the learners' needs m-learning is considered merely an extension of e-learning, but quality m-learning can only be delivered with an awareness of the special limitations and benefits of mobile devices. m-learning has the benefits of mobility and its supporting platform. Learning content can be accessed from any location and is personalized for the individual learner.

e-learning refers to electronically supported learning and teaching of any kind. Any form of learning in which digital communication, electronic devices or the internet is used to support the learning process might be described as a form of e-learning, which also comprises education technology. e-learning includes such processes as computer based learning and internet based learning, but it does not necessarily require either a computer or an internet connection but only the use of electronics. m-learning by its electronic nature, a subset of e-learning, but it refers far more specifically to these handheld devices and portable technology the effectiveness and efficiency of ubiquitous learning heavily relies on the surrounding context of learners.

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wireless networks, bandwidth may degrade with increasing users. Where as in e-learning there is no such problem.

The major difference between e-learning and m-learning is the time when learning is expected to take place and the anticipated duration of the learning session. In the case of e-learning, the learner sits at a computer and progress through a specified amount of materials for a period of time. The length of the time ranges from twenty minutes to two hours. But m-learning is ideal for conveying smaller chunks of information that can be absorbed while waiting for the bus, standing in line at the store or located on or around a job site.

e-learning has come to define any dissemination of educational knowledge over the Internet. This makes e-learning a subset of technology-based training. It also incorporates a number of learning activities conducted on the Internet, of which mobile learning is one part. e-learning can be real-time or self-paced, also known as "synchronous" or "asynchronous" learning. In contrast, mobile learning is often self-paced, un-tethered and informal in its presentation. Because mobile devices have the power to make learning even more widely available and accessible, mobile devices are considered by many to be a natural extension of e-learning. The effectiveness and efficiency of ubiquitous learning heavily relies on the surrounding context of learners.

Table 1: Comparisons of learning paradigms

Criteria	E-learning	M learning	U learning
Concept	Learn at the right time	Learn at the right place and time.	Learn the right thing at the right place and time in the right way.
Permanency	Learners can lose their work.	Learners may lose their work. Changes in learning devices or learning in moving will interrupt learning activities.	Learners can never lose their work.
Accessibility	System access via computer network	System access via wireless networks.	System access via ubiquitous computing technologies.
Immediacy	Learners cannot get information immediately.	Learners get information immediately in fixed environments with specified mobile learning devices.	Learners get information immediately.

Interactivity	Learners' interaction Is limited.	Learners can interact with peers, teachers, and experts in specified learning environment	Learners' interaction with peers, teachers, and experts effectively through the interfaces of u-learning systems.
Context awareness	The system cannot sense the learner's environment.	The system understands the learner's situation by accessing the database	The system can understand the learner's environment via database and sensing the learner's location, personal and environmental situations.

Conclusion

E-learning has brought back the joy in learning through its innovative, interactive content and delivery. E-learning is about embedding and exploiting technologies in all aspects of teaching, and getting ICT embedded across the curriculum for all subjects and in the teaching practices of all tutors. E-learning and M-learning can enhance learning by putting students in a real context and make the process of learning more motivating and interesting. Technology has created a powerful set of tools in the educational world's-learning and has the potential to revolutionize the way of teaching and bring high quality, accessible learning to everyone so that every learner can achieve his/her full potential. Ubiquitous learning is characterized by providing intuitive ways for identifying right learning collaborators, right learning contents and right learning services in the right place at the right time. Many researchers whose investigations involve handheld and mobile devices are referring to their research as ubiquitous learning.

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