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A COMPARATIVE STUDY OF E-LEARNING AND M-LEARNING AND VARIOUS TECHNOLOGIES USED FOR MOBILE LEARNING IN EDUCATION

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ABSTRACT

From the last two decades the popularity and use of smart phones appears to extend exponentially and this rise have introduced the terms Mobile Learning and e-learning within the field of education. M-Learning introduces the academic applications for all age groups and for different ability levels, from games for preschoolers like alphabetic/number games, to applications like physics concepts for scholars. Both E-learning and M-Learning are becoming the backbone of distance learning. But Mobile learning as compared to eLearning is more instant and detailed. Mobile Learning can be used as a supplement to classroom or as on-line learning instead of delivering the course in a classroom. With eLearning, a student can get additional activities away from the classroom-like simulating a school course or technical coaching. ELearning is usually delivered in some sort of course work format and completed over amount of many weeks or months. This paper presents the concept, merits, demerits and differences between E-learning and M-learning. Also various technologies used for leaning on mobile are discussed with conclusion and future scopes.

Keywords: -

E-learning, M-learning, U-learning, ICT, Technology, ET, Distance learning, mobile technology, distant education, mobile devices

INTRODUCTION

Distance education (Girginer, 2002) training was born with the developments in technologies related to the industrial and commercial revolution in European and American countries within the late eighteenth and early nineteenth centuries. With the event of commercial technologies, particularly in communication engineering the teaching at a distance began. Even these days distance education was not be possible if there was no adequate increase in industrialization. The evolution in distance education learning may be defined as a movement from d-Learning (distance learning) to e-Learning (electronic learning) and finally to m-Learning (mobile learning) (Inceoglu, 2006). These three steps of development played a vital role in the development of society, for example the physics revolution of the Eighties and then the wireless revolution by Bell laboratories in 1960s. The online working is changing into a dominant technology because of its capability to access thousands of learners from a commonplace (server). Satellite broadcasting is also playing a valuable role in several developing countries wherever an outsized variety of learners don't have access to the Internet. Videoconferencing, on the opposite hand, has restricted uses, relies on terribly low telecommunications prices and lacks the flexibleness and potential of the online. Harris(2001) defines mobile learning as interaction to supply mobile and pc technologies and internet-based learning to be 'every time, every where' learning expertise. Grosso, 2003; defines mobile learning as getting of data and talent by exploiting mobile technologies.

Mobile learning can be defined as the extension of e-Learning; however the quality m-learning can only be delivered by providing awareness to learners about the special limitations and advantages of mobile devices like quality and ease of use. Learning content may be accessed from any location and is customized for a individual learner. Personalization may be a key part of m-Learning since the issue of navigation and little screen size of mobile devices makes it essential to focus on learning material the maximum amount as potential.



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OBJECTIVES OF THE STUDY

The following were the important objectives of the study:

- To study the important step of moving from d-learning to e-learning.
- To discuss the introduction to Mobile learning.
- To find out the differences between E-learning and Mobile learning.
- To compare the merits and demerits of E-learning and M-learning.
- To find various technologies used for Mobile Learning in education.

E-LEARNING: AN IMPORTANT STEP AHEAD OF D-LEARNING

E-learning refers to the utilization of electronic media, knowledge and various communication technologies like GSM, GPRS, 3G etc. in the field of education. This method completely changed the traditional methods of classroom teaching in electronic way. In a classroom, a teacher provides information, the delivers a prescribed syllabus to the students and manages sequence of the course content and the assessments which are associated with the content. E-learning in the same way manages and distributes relevant content to the students and the learners. E-learning comprises of mainly four components: content, delivery/distribution system, management system and finally the consumers/customers. Collaboration of above said three components – content, delivery/distribution system and management system - will result in a satisfying and productive e-learning expertise for a consumer.

Some important definitions of E-learning are as follows:

- ❖ E-learning is electronically delivered instruction may be in a part or wholly with the help of Internet or an intranet, or through any multimedia system such as CD/DVD-ROM (Hall, 1997).
- ❖ E-learning can be defined as a structured, purposeful use of personal computer or laptop for the learning process (Allen, 2003).
- ❖ E-learning consists of various applications and processes, for example, Web-based learning, virtual classrooms, digital collaboration and computer-based learning. It consists of delivering content by the intranet/extranet, LAN/WAN, audio/videotape, satellite broadcast/interactive TV, and CD/DVD-ROM (ASTD, 2001).
- ❖ E-learning is a training delivered by a system which includes CD/DVD-ROM, Internet/intranet which are specially designed for individual learning and also for organizational performance goals (Clark and Mayer, 2003).
- ❖ E-learning is an instructional content or learning experience delivered by the various electronic technologies (Ong and Wang, 2004).
- ❖ E-learning can be defined as the use of new technologies and applications in the service of learning (Laurillard, 2006).

Global e-learning market, which was over ninety billion dollars, last year, is that the quickest growing market within the education sector. Indian e-learning trade is about to achieve \$1.29 billion by the coming 2018 with the e-learning content expected to grow at a CAGR of 18.4% during the years 2014 to 2018. Indian e-learning technology market is additionally growing YoY. So therefore the range of web users in India crossing 200 million are supporting e-learning as well. A step forward to it is Mobile learning which E-learning and mobile computing altogether. Mobile learning is the extension of E-learning.

INTRODUCTION OF MOBILE LEARNING

The various science discipline technologies and devices have progressed speedily in the field of education in the last two decades. This progress introduced a new term e-learning. Though e-learning is much better as compared to traditional education ways, some deficiencies of its own have lead science world to new pursuits. The rapid development of mobile technologies and its movement in education have unveiled the new notion “m-learning”. The foremost necessary advantage of m-learning to e-



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learning is that the learner can demand information that is independent of time and environment. Mobile learning is type of learning that appeared as a conclusion of co-evaluation of mobile technologies and e-learning fields. Mobile learning is latest way to support traditional learning (Wang, 2004) also a type of advanced distance learning (Mutlu, M.E & others, Barbara et al., 2005).

M-Learning or 'mobile learning' have many some of which are defined below:

- ❖ Shepherd (2001) says: M - learning is not just electronic, it's mobile.
- ❖ Polsani (2003) defines "mobile learning as a form of education whose site of production, circulation and consumption is the network".
- ❖ Sharples (2005), who defines M-learning "as a process of coming to know, by which learners by cooperating peers and teachers, constructs transiently stable interpretations of their own world."
- ❖ Pea and Maldonado (2006) stated that mobile learning incorporates "transformative innovations for learning futures".
- ❖ Peters (2007) also stated that it was a subset of E-learning, a step toward making the educational process "just in time, just enough and just for me" (Peters, 2007, p. 15).
- ❖ Ally (2009) The process of using a mobile device to access and study learning materials and to communicate with fellow students, instructors or institution.

Mobile learning is taken into account to be the power to use mobile devices to support teaching and learning. The term 'mobile' results in more options and practicality for teachers and learners. For instance, podcasts of lectures may be downloaded. Teaching with the help of mobile devices offers the learners mobility, and many other opportunities that cannot be possible with desktop computers. Basic mobile phone options include voice calls, SMS and MMS messages, some basic tools like calculator and also the advanced transportable tools like Bluetooth, Infrared, Camera for taking stills and videos, e-book readers, games, recording audio, GPS services, web browsers etc.

DIFFERENCES BETWEEN E-LEARNING AND MOBILE LEARNING

E-learning has taken learning away from the classrooms and m-learning is taking learning away from a set point. M-learning makes a user to move with informational resources far from their normal place of learning that are classrooms or laptops.

M-learning is extending e-learning, with the soft-cover and alternative moveable resources. Technology currently permits learners to hold immense resources in our pockets and access these where we discover convenient. Technology conjointly permits learners to move with our peers instantaneously and work along remotely.

M-Learning has been gaining attractiveness among younger generations who likes moveable game devices and wireless technology. During this sense, m-Learning appeals not only to those learners that would like learning moveable, but also to those that have mature up with a psychological feature of mobile devices.

More difference between E-Learning and M-Learning are as follows:-

- ◆ E-Learning uses fixed and wired devices such as personal computers, but on the other hand m-learning uses wireless devices such as mobile and smart phones, tablets and PDAs.
- ◆ E-learning is the access to the internet achieved by the telephone service but m-learning uses microwaves for accessing the internet anywhere and any time.
- ◆ In E-learning emails are exchanged by the internet on the other hand MMS and SMS are used to exchange data between users.



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- ◆ In E-learning, transferring books and files is difficult as compared to mobile learning in which Bluetooth and IR technologies are used to exchange these files between learners.
- ◆ Applications which need more storage are more effective in E-learning than ones used in m-learning.
- ◆ In E-learning it is difficult to pass devices between learners while the devices can easily be passed between learners in m-Learning.

Sharma and Kitchens (2004) compares them as :-

E-learning	M-learning
Computer	Mobile
Bandwidth	Bluetooth
Multimedia	Objects
Interactive	Networked
Collaborative	Realistic
Simulated Situation	Social Interaction

Comparison of E-learning to M-learning (Traxler, 2007)

E-learning	M-learning
Structured	Personal
Broadband	Disruptive
Intelligent	Informal
Media Rich	Spontaneous
Interactive	Opportunistic
Usable	Pervasive

The Figure 1 shows the basic difference using various devices.

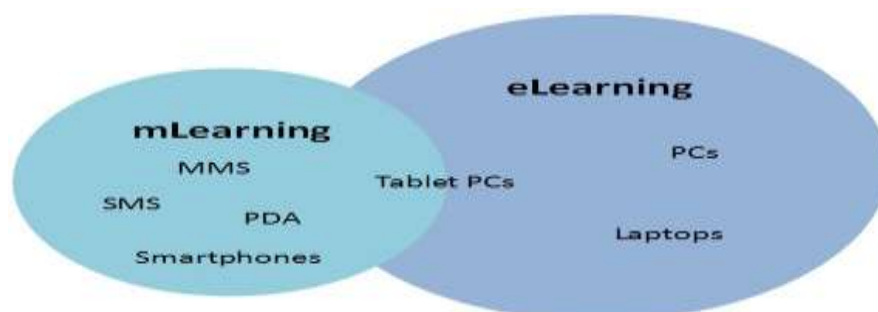


Fig 1. E-Learning is a subset of D-Learning while M-Learning is a subset of E-Learning.



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MERITS AND DEMRITS OF E-LEARNING AND MOBILE LEARNING

The merits of e-Learning are:-

- **Flexibility, Accessibility, Convenience** Learners will proceed through educational program at their own pace and at their own place. Also they can access the e-Learning course anywhere and at any time, and solely the maximum amount as they have. This can be conjointly referred to as "Just in time and simply enough."
- **Cross-platform Support** E-Learning courses can be accessed by internet browsers on any platform like Windows, Mac, UNIX, OS/2, Amiga, etc. For this you can deliver your educational program to any machine over the web or computer network.
- **Browsers and Web Connections** Most laptop users have access to a browser, like web browser or net adventurer, and they are connected to a company's computer network and/or have access to the web.
- **Inexpensive Worldwide Distribution** E-Learning courses can be accessed from any laptop anyplace within the world, that keeps delivery prices low.
- **Ease of Updates** Once the e-Learning course is free, any changes are often created on the server hosting the program and everybody worldwide will instantly access the update. Courses are often designed to access selected current data, like the newest new product specifications, from the other server worldwide for associate degree fastly update whenever the e-Learning course is run.
- **Savings in Travel value and Time** There aren't any travel prices for delivery remote workers to a centralized workshop as a result of the online is accessible from all desktops. in step with some analysts, the particular time needed for coaching by laptop averages concerning five hundredth to it of instructor-led coaching, more saving cash.

The merits of m-Learning are:-

- **Portable:** Mobile devices are light-weight and small in size, and may be simply carried by anyone. inside, outside, to the library, anywhere.
- **Low Cost:** Mobile devices as compared to PCs are less costly. (Note: PCs will typically accomplish more tasks, like spreadsheets, which are hard to do on a mobile device.)
- **Energy Efficient:** Mobile devices need less power to run than PCs.
- **Connected:** Most mobile devices go along with bluetooth or wi-fi as a part of their normal configuration.
- **Rugged:** All mobile devices go along with a solid state drive, instead of moving drive, and may handle accidental drops and misuse.
- **Personal:** No different technology creates such a novel, 1-to-1 feeling with the user than a mobile device. As a result, several academics have seen larger student engagement with mobile devices for learning.
- **Delightful:** In a mobile you are able to bit the screen, manipulate objects, pinch and zoom. you'll be able to hold a tool all told totally different directions and even shake it. You will use it on a table, play with it on the ground, in bed, on the couch or within the automobile.



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- **Special Needs:** Apps will handle special wants during a sort of manners: language, audio, video, colors.
- **Effective:** PBS found that associate degree iPod app will increase vocabulary data by the maximum amount as thirty one %.

Demerits of e-Learning:-

- **Technology dependent:** Learners would like to access to a machine of minimum specification as determined by the e-learning provider.
- **Material Incompatibility:** some materials designed for one explicit system can not operate properly on another (for example, the Apple Macintosh and therefore the Windows PC). Standards can facilitate within the space.
- **Unsuitable for many kinds of Training:** any ability that depends heavily on inter-personal contact though these courses can be supplemented by e-learning.
- **Unsuitable for some kinds of Learners:** elearning needs a high-level of self-discipline and private time management. eLearners ought to be extremely self-motivated to require full advantage of the medium as usually the net learning expertise are often impersonal. operating through 'packaged' programmes are often irritating.
- **Social/economic disadvantage:** will limit or stop access by some student teams (for example, price of kit, on-line access and printing).
- **Too dependent on the Skills:** learners might have restricted IT skills, or be uncomfortable with transmission and wish to be told a way to use the medium effectively.
- **Disabilities:** Students with visual or physical impairments is also deprived.
- **Inflexible:** Flexibility is also lost as adjustments to the course in response to student reaction don't seem to be easy to form once the course is underway.
- **Pedagogically Unsound:** The electronic surroundings doesn't in and of itself provide a didactically enhancing learning surroundings

Demerits of mobile learning are:-

- It is a definite inconvenience of size, because the student needs to learn over the small screen of a smart phone and tablet.
- There isn't any denying that the storage capacities of PDAs area unit restricted.
- Anyone who uses a mobile phone knows that the short battery life and frequent changes of batteries area unit a nuisance.
- Add to the present the absence of a standard hardware platform; this makes it extraordinarily troublesome to develop content to be used by all.
- Devices could become obsolete quickly and students have to be compelled to keep combating devolution.
- Limited wireless bandwidth measure and likelihood is that it should more decrease with the amount of users ever on the rise.



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VARIOUS TECHNOLOGIES USED FOR MOBILE LEARNING IN EDUCATION

Servers: A server is a program that awaits and fulfills requests from client programs of the same or other computers. A given application in a computer may function as a client who requests for services from other programs and also as a server of requests from other programs.

Tablet PC: A tablet PC is a portable PC that is a hybrid of personal digital assistant (PDA) and notebook PC. Equipped with a touch screen interface, a tablet PC usually has a software application used to run a virtual keyboard. However, many tablet PCs support external keyboards. Tablet PCs have built-in Web browsing capabilities, multiple connectivity options, capacitive touch screens and multimedia - including high definition (HD) support. Tablet PCs are also equipped with accelerometers, which allow users to view display screens in portrait or landscape mode.

Smartphones: A smartphone is a mobile phone that includes advanced functionality beyond making phone calls and sending text messages. Most smartphones have the capability to display photos, play videos, check and send e-mail, and surf the Web. Modern smartphones, such as the iPhone and Android based phones can run third-party applications, which provides limitless functionality.

Wireless: A wireless local-area network (LAN) uses radio waves to connect devices such as laptops to the Internet and to your business network and its applications. When you connect a laptop to a WiFi hotspot at a cafe, hotel, airport lounge, or other public place, you're connecting actually connecting to the whole world.

GSM (Global System for Mobile): Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

GPRS: GPRS is a cellular networking service that support web, SMS text messaging, and other data communications. GPRS technology is integrated into so-called 2.5G mobile phones designed to provide faster data transfer speeds than older 2G cellular networks.

Other important technologies include Bluetooth, Infrared, 3G and 4G or LTE which make an important contribution to the learning through mobile in the field of education.

CONCLUSION AND FUTURE WORK

Need of mobile learning (m-learning) in the field of education is the most significant of all the technologies for the better distance education. In this type of learning and gaining knowledge learners does not need time and place. There are many different technologies which are developed for mobiles in terms of revolutionary opportunities like knowledge transfer, knowledge protection and on-line communication. With the evolution and progress of mobile technologies people's desires are fulfilling. The event of mobile technologies has provided necessary benefits in fields of consultants further as for those in want of knowledge. With the above-named benefits, it's currently easier to find out and to access knowledge for people with mobile learning any time and any place. In conclusion, the event of mobile technologies and their in progress have raised the interests of mobile learning (m-learning) and have contributed abundant to each field of education. It will be interesting to see how Mobile Learning continues to develop and change as handheld technology develops and changes as well. The lines between mobile learning and eLearning will probably continue to blur even more as technology advances and learners' attitudes and ideas about education continue to evolve.

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