

E- AND M-LEARNING: A COMPARATIVE STUDY

Assist. Prof. Dr. Santosh Kumar BEHERA
 Department of Education
 Sidho-Kanho-Birsha University
 Purulia, West Bengal, INDIA

ABSTRACT

21st century declared to be the age of information and communication technology. This is the time when more people everywhere are involved in acquiring new knowledge and skills. The world is undergoing transformations due to rapid development of Information and Communication Technology. We can not work in the society without on-line technology. Online technology is also entered in the field of education. Electronic Learning is a subset of Distance Learning and Mobile Learning is a Subset of E-learning. E-learning and M-learning have become extremely important buzz words of the educational technological revolution; each characterising a whole raft of ideas and resources for the tech-savvy teacher. But the two terms are not always used correctly, with some confusion about the differences between them and where they overlap. And in more complex terms, thinking about the differences between E-learning and M-learning can be particularly useful for teachers who use technology in the classroom, as it can help them to pick out which techniques are best for which education scenario. The present paper was based on secondary sources of data highlighting the comparison of concept, characteristics, advantages, disadvantages, similarities and differences between E-learning and M-learning.

Key Words: E-learning, M-learning, U-learning, ICT, Technology, ET, Distance learning.

INTRODUCTION

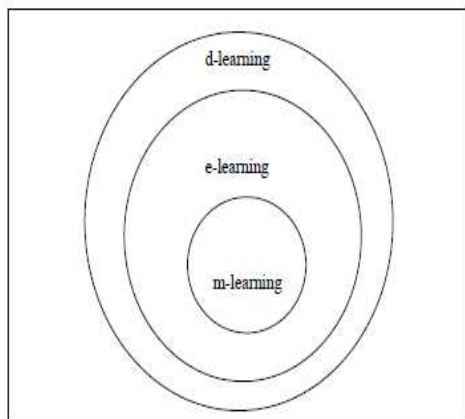
E-learning plays an important role in the educational growth of any nation. It also offers opportunities for developing nations to enhance their educational development. It can also plays a critical role in preparing a new generation of teachers, as well as upgrading the skills of the existing teaching force to use 21st century tools and pedagogies for learning. So it is the changing trend in education. The modern technologies particularly the internet made education no longer limited to the four walls of the class room. E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked or not serve as specific media to implement the learning process. The term will still most likely be utilized to reference out-of classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum.

Mobile learning combines E-learning and mobile computing. Mobile learning is sometimes 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. Mobile learning has the benefits of mobility and its supporting platform. M-learning is a means to enhance the broader learning experience. M-learning is a powerful method for engaging learners on their own terms. E-learning and M-learning diagrammatically mentioned below:--

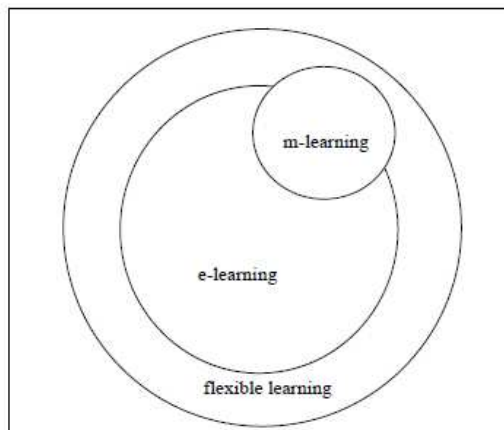
Functionality		Mobility		
Computer	Laptop computers	PDA's handhelds palmtop	Smart phones	Mobile phone
E- Learning		M-Learning		

(Functionality and mobility in a definition of mobile learning)

Though there are some differences lies between E-learning and M-learning, they are closely related. M-learning is a sub-set of E-learning. Their relationships are diagrammatically given below:-



Perspective of learning paradigms
 (Georgiev et al., 2004)



Relationship of E-learning, M-learning
 & Flexible Learning (Low and O'Connell, 2006)

Mobile technology in word open various ways for new educational technologies aimed at fulfilling the country's educational needs. There are various ways to use mobile phones for enhancing learning. Mobile phone plays an important role in our day-to-day lives in various purposes. One of the important purposes is learning. Mobile learning, as a novel educational approach, encourages flexibility; students do not need to be a specific age, gender, or member of a specific group or geography, to participate in learning opportunities. Restrictions of time, space and place have been lifted.

SIGNIFICANCE OF THE STUDY

In this new millennium modern technology plays inevitable role in our lives. The technological revolution poses tremendous challenges to the educators to rethink their basic tenets, to apply technology in creative way to redesign education. In this context, E-learning and M-learning play an important role. These are the new innovations which help greater learning opportunities for the students. The study will cover a wide range of topics relating the context of E-learning, M-learning, their characteristics, advantages and disadvantages. The present study also judges the similarities and differences between E-learning and M-learning. The study reveals with supporting education through modern technology, solving educational problems, promoting educational outcomes linking it with real life situations.

Objectives Of The Study

The following were the specific objectives of this study:

- To shed light on the concept of E-learning and Mobile learning.
- To focus on the characteristics of E-learning and Mobile learning.
- To compare the advantages of E-learning and Mobile learning.
- To compare the disadvantages of E-learning and M-learning.
- To judge the similarities and differences between E-learning and Mobile learning.

Research Questions

The study addressed the following questions:

- What is meant by E-learning?
- What is meant by M-learning?
- What are the characteristics of E- learning?
- What are the characteristics of mobile learning?
- What are the advantages and disadvantages of E-learning?

- What are the advantages and disadvantages of mobile learning?
- What are the similarities and differences between E-learning and mobile learning?

Design Of The Study

The researcher was adopted the analytical descriptive approach in collecting data, information, facts, concepts and opinion related with various phases of this study. The researcher was also reviewed previous literature of the concept, characteristics, advantages and disadvantages of E-learning and Mobile learning.

Plan Of The Study

The study was done in five main phases:

1. First Phase: The concept of E-learning and M-learning.
2. Second Phase: The characteristics of E-learning and Mobile learning.
3. Third Phase: Comparison between the Advantages of E-learning and M-learning.
4. Fourth Phase: Comparison between the Disadvantages of E-learning and M-learning.
5. Fifth Phase: Similarities and differences between E-learning and mobile learning.

1. First Phase: The concept of E-learning and M-learning

E-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. It may include the use of web-based teaching materials and hypermedia in general, multimedia CD-ROMs, websites, discussion boards, collaborative software, e-mail, blogs, wikis, test chat, computer aided assessment, educational animation, simulations, games, learning management software, electronic voting systems and more, with possibly a combination of different methods being used. E-learning is an approach to facilitate and enhance learning through and based on both computer and communication Technology. It is used to support distance learning through the use of WANS (Wide Area Net Workers), and may also be considered to be a form of flexible learning where learning is possible in no time. E-learning is also called 'online learning'. It is developed to apply information technology skills to education getting connected to the internet or any network is essential for E-learning. E-learning or Electronic learning is a general term used to refer to computer-enhanced or technology enhanced learning. E-learning is naturally suited to distance learning and flexible learning, but can also be used in conjunction with face to face teaching, in which case the term blended learning is commonly used. E-learning is a means of education that incorporates self-motivation, communication, efficiency, and technology. It is a flexible term used to describing a means of teaching through technology. E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance (Rosenberg, 2001; Wentling et al., 2000). In general, E-learning is the expression broadly used to describe "instructional content or learning experience delivered or enabled by electronic technologies" (Ong and Wang, 2004). Broadly, we can define it as "the use of the Internet, intranets / extranets, audio and videotape, satellite broadcast, interactive TV, and CD-ROM, not only for content delivery, but also for interaction among participants". Elliott Masie defines "E-learning as the experience dimension of E-learning, which includes such factors as engagement, curiosity, simulation and practice". E-learning can be defined as the use of any of the new technologies or applications in the service of learning or learning support (Laurillard, 2006). E-learning means sharing knowledge using technology, computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer-based learning, virtual classroom and digital collaboration. Content is delivered via Internet, intranet/extranet, wireless telephonic, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio. It is the use of the Internet and related technologies for the development, distribution and enhancement of learning resources. This form of learning currently depends on networks and computers, but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted. E-learning can take the form of courses as well as modules and smaller learning objects. E-learning may incorporate synchronous or asynchronous access and may be distributed geographically with varied limits of time (Wentling, Waight, Fleur, Wang, and Kanfer, 2000).

There are some other definitions of E-learning which are as follows:

- E-learning is instruction that is delivered electronically, in part or wholly – via a Web browser, through the Internet or an intranet, or through multimedia platforms such as CD-ROM or DVD (Hall, 1997).

- E-learning is a structured, purposeful use of electronic system or computer in support of the learning process (Allen, 2003).
- E-learning covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes delivering content via the Internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM (ASTD, 2001).
- E-learning is training delivered on a computer (including CD-ROM, Internet, or intranet) that is designed to support individual learning or organizational performance goals (Clark and Mayer, 2003).

Mobile learning, sometimes called M-learning, is learning accomplished with the use of small, portable computing devices. These computing devices may include: smart phones, personal digital assistants (PDAs) and similar handheld devices. There is some debate on the inclusion of tablet and laptop computers. Often, wireless two-way internet connection is assumed as an integral component. Mobile learning refers to the use of mobile or wireless devices for the purpose of learning while on the move. Typical examples of the devices used for mobile learning include cell phones, smartphones, palmtops, and handheld computers; tablet PCs, laptops, and personal media players can also fall within this scope (Kukulska-Hulme & Traxler, 2005). M-learning is the idea that a student can learn from any place at any time using portable learning devices. M-learning or 'mobile learning' is any sort of learning that takes advantages of learning opportunities offered by mobile technologies.

- M-learning means "*acquisition of any knowledge and skill through using mobile technology anytime, anywhere that result in alteration of behaviour".*
- M-learning also brings strong portability by replacing books and notes with small RAM's filled with tailored learning contents.
- M-learning implies different things to different people. Here there are some definitions of M-learning given below:
- According to Quinn (2000) "*Mobile learning is learning through mobile computational devices*".
- Shepherd (2001) Says: M-learning is not just electronic, it's mobile.
- Colazzo, Ronchetti, Trifonova, and Molinari (2003) state that, "*A mobile learning educational process can be considered as any learning and teaching activity that is possible through mobile tools or in settings where mobile equipment is available.*"
- Polsani (2003) defines "*mobile learning as a form of education whose site of production, circulation and consumption is the network*".
- Pinkwert et. al. (2003), who defines M-learning as ". . . *E-learning that uses mobile devices and wireless transmission.*"
- Trifonova (2003) Any form of learning (studying) and teaching that occurs through a mobile device, or in a mobile environment.
- Sharples (2005), who defines M-learning "*. . . as a process of coming to know, by which learners in cooperation with their peers and teachers, construct transiently stable interpretations of their world.*"
- Traxler (2005) defined it as "*any educational provision where the sole or dominate technologies are hand held and palmtop devices.*"
- Pea and Maldonado (2006) stated that mobile learning incorporates "*transformative innovations for learning futures*".
- Parsons & Ryu (2006) M-learning is broadly defined as the delivery of learning content to learners utilizing mobile computing devices.
- 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.

M-learning provides the potential to provide the right information to right people at the any time and any place using portable learning devices. Thus the M-learning can be summarized in a single statement – "***deliverance of education or any learning via any portable devices***".

2. Second Phase: The Characteristics of E-learning and Mobile learning

There are some important characteristics of E-learning mentioned below:

- **Empowered by digital technology:** E-learning is pedagogy empowered by digital technology.
- **Computer enhanced learning:** E-learning is a term which is used to refer computer enhanced learning.
- **Technology enhanced learning:** E-learning includes all types of technology enhanced learning (TEL), where technology is used to support the learning process.
- **Online learning:** Use of E-learning is generally confined to “on-line learning” carried out through the Internet or Web-based technology, with no face-to-face interaction.
- **More than CBL and CAI:** E-learning conveys broader meaning than the terms CBL (Computer based learning) and CAI (Computer assisted instruction).
- **More than on-line learning:** E-learning is broader in its meaning that they conveyed through the simple terms like “on-line learning” or “on-line education”.
- **Not synonymous to audio-visual and multimedia learning:** E-learning should not be considered as synonymous to audio- visual learning, multi-media learning, distance education or distance learning. Although the audio-visual and multimedia technology and distance education programmes are based on the Internet and Web services provided through the computers, yet these are not identical but complementary.
- **Confined to Web-based and Internet-based learning:** The use of the term E-learning should be confined to the type of learning carried out, supported or facilitated through Web enhanced instruction and the Internet based communications like e-mail, audio and video conferencing, mail list, live chats and telephony.
- **Exclusion of non-Internet and non-Web technology:** All types of non-Internet and non-Web technology are not included in E-learning.
- On the other hand M-learning has following characteristics:
- **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** - The environment can adopt to the learners real situation to provide adequate information for the learners.
- **Permanency** - The information remains unless the learners purposely remove it.
- Flexible Learning, Large mass covered, reduces students’ indiscipline and unrest problem.
- Used Very where at every time.
- Most of mobile devices have lower prices than desktop PCs.
- Similar size and light weight than desktop PCs.
- Ensure bigger students engage as M-learning is based on modern technologies, which students use in everyday life.

3. Third Phase: Comparison between the Advantages of E-learning and M-learning

The following are the advantages of E-learning:

- **Individualized instructions:** E-learning provides individualized instructions suiting to the need, abilities, learning styles and interests of the learners. E-learning has much potential to make the education, instruction and learning opportunities provided to the learners adaptable to the need, local need and resources at their hands. Thus, it is learner centred.
- **Easy access:** The learner gets access to learning by breaking all barriers of time, place and distance. The learners can access information and educational contents anytime and at anyplace. E-learning is available even in areas where there is no school or college. It can reach any remote or far off areas of the country or world.
- **Disadvantageous children:** it is available for those with poor health or disadvantageous conditions that can inhibit them from under going any institutionalized education. E-learning enables even handicapped liked deaf and dumb to learn.

- **Qualitative:** E-learning has a unique feature of arranging an access to unlimited number of students the same quality of the content that a fulltime student has.
- **Effective media:** E-learning can prove an effective media and tool for facing the problem so lack of trained teachers, shortage of schools and needed facilities for providing quality education to the number of students residing in far and wide corners of the country.
- **Different learning styles:** Unlike traditional classroom education, E-learning can cater to different learning styles and promote collaboration among students from different localities, cultures, regions, states and countries.
- **Flexibility:** The flexibility of E-learning in terms of delivery media (like CD, DVD, Laptops and Mobile Phones), type of courses and access may prove very beneficial for the learners.
- **Play-way spirit and learning by doing:** Learning experiences via simulated and gaming techniques may also provide the advantages of getting richer experiences on the useful pedagogical footings of play-way spirit and learning by doing or leaving.
- **Interesting and motivating:** E-learning may make the students more interested and motivated towards learning as they may get a wide variety of learning experiences by having an access to multimedia.
- **On-line, Off-line and live interaction:** The opportunities of having an on-line, off-line and live interaction between the students and teachers and among the students themselves may make the task of E-learning a joy and best alternative to the lively face-to-face interaction and real time sharing of the experiences in a traditional classroom settings.
- **Self-learning and self-improvement:** E-learning leads to self-learning. It can be utilized for improving technical and vocational skills.
- **Evaluation and feedback:** E-learning can also provide opportunities for testing and evaluating the learning outcomes of the learners through teachers, peers and auto-instructional devices and software available with there a ding material online, or through the internet and mobile phone facilities

There are also a lot of advantages of mobile learning. These are listed below:-

- **Increased mobility:** Learning is not restricted to fixed locations any more. Mobile devices allow learners to access learning content and learning interactions anywhere, such as factories, museums, hospitals, shopping malls, cafes and outdoor areas.
- **Time-saving:** People can now study when they are commuting and traveling.
- **Environmental-friendly:** It is amazing to find out how much information a mobile device can carry despite its light weight. Less printing is required.
- **Interactive:** Mobile technology enables students to closely link with their peers, teachers, distant partners, and even interest groups worldwide.
- Use of relatively inexpensive everyday technologies.
- Better opportunities to acquire skills at one's own pace, with a degree of privacy that may be missing when using shared computer facilities or relying on equipment belonging to somebody else.
- Good support for preferred modes of interaction, e.g. accessing audio content or participating in social networks on the move.
- Catering for interests beyond what is provided in class, through access to additional content such as podcasts or free learning materials (e.g. Open Learn).
- Handheld devices are often an everyday part of business, so learning can contribute directly to enhancing employability, life skills and work practices.
- Opportunities for learners to give immediate feedback on their learning experience.
- Better assessment and diagnosis of learning problems as they occur.
- Psychological support for those at risk of dropping out, through social networks or personal guidance from a mentor.
- Learning materials can become accessible to a larger audience, through podcasts, mobile applications, blogs and e-books, which are seen by potential students.
- Catering for disadvantaged social groups for whom mobile learning presents an opportunity to improve their life chances.

- Revitalizing the curriculum, rethinking teaching methods and implementing improved feedback to learners.
- Turning geographically dispersed learners into a valuable teaching resource by enabling them to contribute their local knowledge and research data more easily.
- Supporting learner retention, progression and transition.
- Making the learning experience more tailored to the changing needs of individuals, encouraging learners to return for knowledge updating and further study.
- Mobile educational systems have started to emerge as potential educational environments supporting lifelong learning though other forms of learning like distance learning etc are very popular in India, learning is yet to find a pathway into Indian educational system. Also to notice that India's mobile services market is growing at a very rapid pace and the technological base required supporting mobile devices is also quite strong in India. So India has the potential to be considered as a strong market for M-learning.
- The learning material is mostly colourful and inviting which may prompt students to go back and forth and practice more.
- Learner gets stimulated in learning.
- Convenient.
- Interesting.

4. Fourth Phase: Comparison between the Disadvantages of E-learning and M-learning

The following are the disadvantages of E-learning:

- **Requires knowledge and skills:** E-learning requires special knowledge and skills for the use of multimedia Internet and Web technology on the part of the users. Lack of knowledge and skills on this account may prove futile in taking advantages from the valuable services of E-learning.
- **Lack of equipment:** Most of our schools are not at all ready, willing and equipped for making use of E-learning in the proper interest of the teachers and students. Leaving aside a small number of self financing public schools meant for children of rich parents, most of the schools in our country cannot even imagine for venturing in the area of E-learning.
- **Costly:** E-learning is more costly than traditional education. E-learning tools are very expensive. Their repair is also very expensive. Hence, E-learning is beyond the rich of most of the students. They do not have resources for purchasing electronic equipment.
- **Feeling of Isolation and Missing Social Contact:** The feeling of isolation experienced by the users of E-learning is one of the main defects quite visible in any system of distance learning including E-learning. There is no face-to-face interaction and humanistic touch profoundly available in the traditional class room setup. Moreover the lack of social participation and community sharing experiences may prove handicap to the students of E-learning in their adequate physical, emotional and social development.
- **Lack of provision for teacher training programme:** There is lack of provision of equipping the teachers in their pre-service or in-service programmes for getting acquainted with the knowledge and skills required on their part for the use of E-learning at their work places. As a result, the teachers neither have any inclination towards E-learning nor have any competence for its organization in the school or providing guidance to their students in its use.
- **Negative attitude:** An overall attitude of the learners, teachers, parents, educational authorities and society is usually found negative towards the processes and products of E-learning. E-learning is adjusted as second rate in comparison to regular classroom teaching.
- **Adverse effect on health:** E-learning adversely affects the eyesight and some other parts of the body. The learners become physically inactive. Sometimes they become victims of physical diseases.
- **Lack of co-curricular activities:** Co-curricular activities have great importance in the field of learning and education. But these activities are neglected in E-learning.
- **Technical defect:** E-learning is based on technology. When technical defect occurs, E-learning stops. As a result, continuity of learning is broken and there is no progress in E-learning.
- Stressful and consumed more time.

There are also a lot of disadvantages of mobile learning. These are listed below:

- There is no denying that the storage capacities of PDA are limited.

- Device may become outdated quickly and students have to keep combating obsolescence.
- The buttons on the keypad or styles pens are small and can be tricky for some people to manipulate. There are attachable keyboards available for some devices but these are also small, can be different to use to cost money.
- Too small display.
- Usable with some models only.
- Network connectivity limitations.
- Expenses / Costs.

5. Fifth Phase: Similarities and Differences between E-learning and Mobile learning

E-Learning is a subset of Distance Learning – Mobile Learning is a Subset of E-Learning. The conceptual shifts from E-learning to M-learning then to u-learning are given below:-

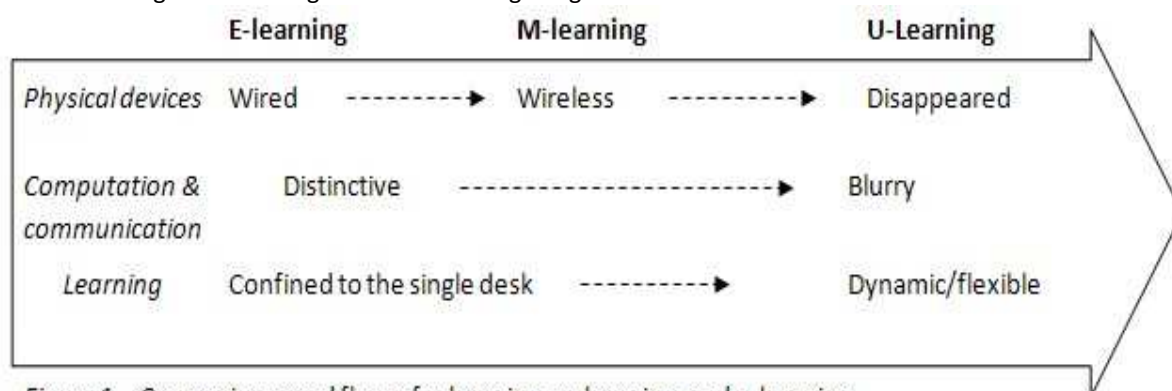


Figure 1. Comparisons and flow of e-learning, m-learning, and u-learning.

Similarities

- Each of them needs an infrastructure and a wide community base in dealing with wire and wireless electronic computer technologies.
- Each of them needs a high cost technological system.
- E- and M-learning provide students with digital literacy focusing on information processing.
- Students are centre of learning process in both models (Self- Learning).
- In both learning models students can access and surf the internet.
- E-and M- learning models allow communication between individual students and between students and teachers anywhere and at anytime from one hand, and communication with local and international on the other via the use of e-mails and text message.
- In both learning models the learning content is delivered in the form of texts, images and video clips.
- Both learning models depend on developing problem solving and creative thinking skills among students.
- E-and M- learning models are capable of providing learning opportunities to many students.
- Learning material can be updated continuously in both learning models.

Differences

- E- learning use fixed, wire devices such as PC's, but mobile learning uses wireless communication devices such as cell and smart phones, micro computers and personal digital assistants.
- In E- learning, access to the internet is achieved the available telephone service, while mobile learning uses IR when accessing the internet anywhere at any time.
- In E- learning, messages are exchanged via the internet whereas MMS and SMS messages are used to exchange information between users.
- In E-learning, it is difficult to transfer books and files between individual learners, while in mobile learning, Bluetooth and IR technologies are used to exchange books and files among learners.
- Storage applications used in E-learning are more effective than ones used in mobile learning.

- Communication channels used in E-learning have low protection levels as learners use more than one device, whereas mobile learning provides users with more protection as learners use their own devices to connect with others.
- It is difficult to pass devices through learners in E-learning while these devices are easy to pass between learners in mobile learning.

In an attempt to distinguish E-learning from M-learning, Sharma and Kitchens (2004).

<u>E-learning</u>	<u>M-learning</u>
Computer	Mobile
Bandwidth	Bluetooth
Multimedia	Objects
Interactive	Networked
Hyperlinked	Situated Learning
Collaborative	Realistic Situation
Distance Learning	Constructivism
Simulated Situation	Social Interaction
Hyper Learning	Collaborative

Traxler (2007) attempts to further distinguish E-learning from M-learning by analyzing the descriptions of both fields found in the literature. Comparison of E-learning to M-learning (Traxler, 2007):

<u>E-learning</u>	<u>M-learning</u>
Structured	Personal
Media-Rich	Spontaneous
Broadband	Disruptive
Interactive	Opportunistic
Intelligent	Informal
Usable	Pervasive
	Situated
	Private
	Context-Aware
	Bite-Sized
	Portable

Differences between E- and M-learning environments with respect to methods of Evaluation, communication between actors, and terminology.

E-learning	M-learning
Computer	Mobile
Bandwidth	GPRS, G3, Bluetooth
Multimedia	Objects
Interactive	Spontaneous
Hyperlinked	Connected
Collaborative	Networked
Distance learning	Situated learning

Respect to communication between actors (instructor and student)

E-learning	M-learning
Communication	Communication
Asynchronous	Synchronous
Scheduled	Spontaneous
Time-delayed	Instant delivery
Passive	Instant

Student and student

E-learning	M-learning
Face-to-face	Flexible
Audio-teleconference common	Audio and video- conference possible
Private location	No geographic boundaries
Travel time to reach Internet site	No travel time since wireless connectivity

Respect to methods of Evaluation

E-learning	M-learning
1-to-1 basis possible Asynchronous and at times delayed	1-to-1 basis possible Both asynchronous and synchronous
Mass/standardized	Customized
Instruction	Instruction
Benchmark-based grading	Performance & improvement-based grading
Simulations & lab based experiments	Real-life cases and on the site experiments
Paper-based	Less paper, less printing, lower cost

CONCLUSION

However E- and M-learning play an important in the field of modern education. In spite of some differences, there are some relationship lies in them. E- and M-learning encourage both teachers and students to take personal responsibility for their own learning. When teachers succeed it builds self-knowledge and self confidence in them. The recent trend in E-learning sector is screen casting. E- and M-learning will also bring a substantial change in the method of spreading knowledge to improve the quality in teacher education and hence will make teachers of global standard. Thus, these are beneficial to education, corporations and to all types of teachers / learners. It is the effective learning process created by combining digitally delivered content with learning support and service. Therefore, we can conclude that teachers need to acquire technological skills in order to succeed in E-learning. Mobile technology is also used in learning purpose. It is an innovative educational approach which provides learning opportunities to the students.

BIODATA AND CONTACT ADDRESS OF AUTHOR



Dr. Santosh Kumar BEHERA is an Assistant Professor, Department of Education, Sidho-Kanho-Birsha University, Purulia, West Bengal, INDIA. His research interests are Sc and St Education, Distance Education, Peace Education, Environmental Education, Human Rights Education, Teacher Education, Philosophy of Education and Educational Technology. He is the Editor-in-Chief, EDUQUEST, An International Refereed Journal in Education (ISSN: 2277-3614).

Dr. Santosh Kumar BEHERA
Department of Education
Sidho-Kanho-Birsha University
Purulia, West Bengal, INDIA,
Pin-723101
Mobile: 91-9475660604 or 9635928135
E Mail: santoshbehera.jkc@gmail.com
santoshbehera.vb@gmail.com

REFERENCES

- Allen, M.W. (2003). *Michael Allen's guide to E-learning*. Hoboken, New Jersey: John Wiley & Sons, Incorporated.
- Ally, M. (Ed.). (2009). *Mobile learning: Transforming the delivery of education and Training*. Athabasca University Press.
- Ahuja, N., Ahuja, T. & Holkar, A., *Need and Significance of E-learning in Education*, Retrieved from <http://pioneerjournal.in/conferences/tech-knowledge/14th-national-conference/3802>.
- Attewell. J. (2005) *Mobile Technologies and Learning*, London Learning and Skills Development Agency.
- Awad. A. A (2007) *Technology of M- learning ... A step toward a better learning*, Available: amanysm9498.jeeran.com
- Begum, A.J., Natesan, A.K. & Sampath, G. (2011). *ICT in Teaching Learning*, New Delhi: APH Publishing Corporation.
- Clark, R.C., and Mayer, R.E. (2003). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. San Francisco, California: John Wiley & Sons, Incorporated.
- Colazzo, L., Molinari, A., Ronchetti, M., & Trifonova, A. (2003). Towards a Multi-Vendor Mobile Learning Management System. Proceedings for the *World Conference on E-learning*. Phoenix, USA. Retrieved April 24, 2007.
from: [http://www.science.unitn.it/~foxy/docs/Towards%20a%20multivendor%20Mobile%20LMS%20\(long\).pdf](http://www.science.unitn.it/~foxy/docs/Towards%20a%20multivendor%20Mobile%20LMS%20(long).pdf)
- Conrad, K. (2000). *Instructional design for web-based training*. Amherst, Massachusetts: HRD Press.
- Dahshan, J. A., *M-learning ... Its characteristics*, Available: www.etar.net/vb/showthread.php
- Desmond. K. (2010) *The future of learning: From E-learning to M-learning*. Available on line at [http://learning.ericsson.net\(2010\)](http://learning.ericsson.net(2010))

Dahshan,J, Younis.J (2009) M- learning A New Form of Remote Learning. *.A research presented to the first scientific seminar of Education College titled "Hypothetical Higher Education Systems*, Kefir AL-Sheikh University, Egypt.

Faqeeh. A. (2009). *M-learning...A New vision by using wireless technology*. Available: Math – Nablus,y007.com/search. Forum.

Georgiev, T., Georgieva, E. & Smrikarov, A. (2004). *M-learning – A new stage of e-learning. Proceedings International Conference on Computer Systems and Technologies –CompSysTech'*, 1-5. Retrieved February 2011 from <http://ecet.ecs.ru.acad.bg/cst04/Docs/sIV/428.pdf>

Ghazaw. A.M (2009). *M-learning...A New vision by using wireless technology*. Available: Math – Nablus,y007.com/search. Forum.

Hall, B. (1997). *Web-based Training*. John Wiley & Sons, Inc., New York.

Hammami, M (2006). M-learning, a new stage of e- Learning, Information. *Magazine- Automation in leaning*, No.6, pp.70.

Hana M. Eltayeb Abdalla and Mohammed Osman Ali Hegazi. *Mobile phone: Portable Devices In Learning*. Ppt.

Harithi, M. A, "M-learning", A research at King Saud University, published in Riyadh Newspaper, 20/1/2008.

James Kadirire (2007) Instant Messaging for Creating Interactive and Collaborative M-learning Environments, *International Review of Research in Open and Distance Learning*, Volume 8, Number 2. June.

Jaiswal, D. (2012) New Approaches in Learning: E-learning, M-learning and U-learning. *Scholarly Research Journal for Interdisciplinary Studies*. Vol-1, Issue-II, Sept.

Jason G. Caudill, 'The Growth of m-learning and the Growth of Mobile Computing: Parallel developments', *The International Review of Research in Open and Distance Learning*, Vol. 8, No 2, 2007. From <http://www.irrod.org/index.php/irrod/article/view/348/873> (last access: 08, November 2011).

Kaveh, Mohammed Hussain. *E-learning: Advantages and Disadvantages*.

Khmis.M. Attiyah (2010). E-learning Systems and Technology, Retrieved. [Eaat. Net/ ar/plugins/ content, php? Content 14](http://www.net-ar.com/plugins/content.php?Content=14)-(2010).

Kukulska-Hulme, A., & Traxler, J. (2005). *Mobile learning: A handbook for educators and trainers*. London: Routledge.

Kynaslathi, H (2003). In search of element of Mobility in the Context of Education. In *Mobile Learning*. pp.41-48.

Laurillaard, Diana (2002), *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies* (2nd edition) (London: Routledge Falmer).

Low, L. & O'Connell, M. (2006). Learner-centric design of digital mobile learning. OnlineLearning and Teaching Conference – OLT Conference 2006. 26 September, Brisbane,Australia. Retrieved March 15, 2011 from https://olt.qut.edu.au/udf/OLT2006/gen/static/papers/Low_OLT2006_paper.pdf

Moussa, A. A, E- learning: characteristics, Advantages, Obstacles. *A research paper presented to the forum of future school,, King Saud University,16-17/8/2010*.

Ong, C.S., Lai, J.Y., & Wang, Y. S. (2004). Factors Affecting Engineers' Acceptance of Asynchronous E-learning Systems in High-Tech Companies. *Information and Management*, 41 (6), 795-804, p.01.

Paul Resta, E-learning for Teacher Development: Building Capacity toward the Information Society.

Patil, V.N. & Sawale, A.N. (2012). M-learning: The Revolutionary E-Learning for Enhance Learning. In Nikose, R.L.(Ed.). *Teacher Education: Issues and Challenges*. New Delhi: APH Publishing Corporation.

Paliwal, S. and Sharma, K.K. Future Trend of Education – Mobile Learning Problems and Prospects.

Polsani, P. (2003). Network learning. In K. Nyinri k. (ed.) *Mobile Learning Essay on Philosophy, Psychology and Education*, Vienna: Passage vertaq, 2003 139-150, ISBN – 38511656032.

Pea, R., & Maldonado, H. (2006). WILD for learning: Interacting through new computing devices anytime, anywhere. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 427-441). Cambridge: Cambridge University Press.

Park, Yeonjeong (2011). A Pedagogical Framework for Mobile Learning: Categorizing Educational Applications of Mobile Technologies into Four Types, *The International Review of Research in Open and Distance Learning*, Vol.12, No.2, February. <http://www.irrodl.org/index.php/irrodl/article/view/791/1699>

Parsons, D., & Ryu, H. (2006). A framework for assessing the quality of mobile learning. *Massey University website*. Retrieved February 20, 2007 from: <http://www.massey.ac.nz/~hryu/M-learning.pdf>

Peters, K. (2007). M-learning: Positioning educators for a mobile, connected future. *International Journal Of Research in Open and Distance Learning*, 8(2), 1-17.

Quinn, C. (2000). M-learning: Mobile, Wireless and In-Your-Pocket Learning. *Line Zine*.

Romesh Verma (2007), E-learning Strategies in Teacher Education, *University News*, Vol 45 No.18 April.

Rosenberg, M. J. (2001) *E-learning Strategies for Delivering Knowledge in the Digital Age*, New York: McGraw-Hill.

Saleem, T.A. (2011). Mobile Learning: A New Step in E-learning. *Journal of Theoretical and Applied Information Technology*. Dec. Vol.34. No.2.

Shepherd C. (2001). M is for May be. Tactix: Training and Communication Technology in context. p.5.

Sharma, S.K. & Kitchens, F.L. (2004). Web services architecture for M-learning. *Electronic Journal on e-Learning*, 2(1), 203-216.

Sharples, M. (2005). Learning as conversation: Transforming education in the mobile age. *Proceedings Seeing Understanding, Learning in the Mobile Age*, Budapest, April 28-30,147-152. Retrieved January 2011 from <http://www.eee.bham.ac.uk/sharplem/Papers/Theory%20of%20learning%20Budapest.pdf>

Srisakdi Charmonman, and Natanicha Chorpothong (2005) Digital Lifestyle and the Road Ahead, Special Issue of *the International Journal of the Computer, the Internet and Management*. Vol.13 No.SP3, November.

Thaisit, P. and Jitgarun, K. (2006). Advantages and Disadvantages of m-Learning for University Students in Thailand, *APERA Conference, 28 – 30 November 2006 Hong Kong*.

Trifonova, A. (2003). Mobile learning – Review of the literature. *Technical Report DIT-03-009, Informatica e Telecomunicazioni, University of Trento*. Retrieved February 2011 from <http://eprints.biblio.unitn.it/archive/00000359/01/009.pdf>

Traxler, J., (2005). Defining Mobile learning. *Proceedings IADIA International conference on mobile learning 2005, Malta*. Pp – 261-266. [www.mlearning.org.20/cd/papers/Lauris%20 & 20% Eteokel pdf](http://www.mlearning.org.20/cd/papers/Lauris%20&20%20Eteokel.pdf) (retrieved on 17.08.2010).

Traxler, J. (2007). Defining, Discussing and Evaluating Mobile Learning: the Moving Finger Writes and having Written. *International Review of Research in Open and Distance Learning 8(2)*.

Wagner, E. (2005). Enabling Mobile Learning. *EDUCAUSE review, 40(3)*. May/June. Retrieved February 2011, from <http://www.educause.edu/ir/library/pdf/erm0532.pdf>

Wentling, T. and Others (2000). *E-learning: A Review of Literature*. Retrieved from: <http://learning.ncsa.uiuc.edu/papers/elearnlit.pdf> on Nov.2005.

[www.mlearning.org.20/cd/papers/Lauris%20 & 20% Eteokel pdf](http://www.mlearning.org.20/cd/papers/Lauris%20&20%20Eteokel.pdf) (retrieved on 17.08.2010).

www.mlearn.org.za/CD/papers/Barker.pdf

www.slideshare.net/yash2/elearning, Feb 14,2012

<http://mlearning.wikispaces.com/advantages>

Yuhsun Edward Shih and Dennis Mills (2007) Setting the New Standard with Mobile Computing in Online Learning, *International Review of Research in Open and Distance Learning, Volume 8, Number 2.*, June.