E-Learning: Evolution to Revolution

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Abstract

The E-Learning considered as Computer assisted Learning has been around since the 1960s' but its adoption and popularization mainly started after the popularization of the Internet and the Web. Since its introduction till present days the E-learning rapidly evolved regarding the technology and the E-learning methods/tools used. It captures a broad range of electronic media like Internet, Intranet, Extranets, Satellite broadcast, Audio/Video tape, Interactive TV and CD –Rom to make the learning Procedures more flexible and user friendly. Because of the flexible nature of E-learning, it has got more demand among the people of our country and the demand is increasing day by day. The basic objective of the paper is to understand the concept of E-Learning and to examine its historical background. Focus has also been given on technological trends in the field of E-Learning .The paper also outline and discuss some major Indian initiatives in E-learning. The research showed that there is abundance of available technology and E-learning tools that foster and support the learning process. It is evident that E-learning is widely used in education sector and it is expected to grow further. Our research revealed that the trends that dominate and will further shape the E-learning landscape include but are not limited to: Mobile Learning, Micro Learning, Internet of things(IoI),Cloud based E-Learning, Blended Learning, Gamification, Personalized Learning, Continuous Learning, Adaptive Learning, Augmented Reality, Video E-Learning, Beacon E-Learning and more. Having gone through numerous diverse evolutionary phase, E-learning is still evolving mutually alongside the upsurge in modern technology. Advancement in new technology makes it practical to blend synchronous and asynchronous training into one. Modern e-learning methods are considered to be revolutionizing contemporary learning systems. E-learning is an effective tool for development of education sector in India.

Keywords: E-learning, Development, Trends, Indian Initiatives

1. INTRODUCTION

E-Learning is as an approach to instruction and learning that utilize Information and communication technologies to communicate and collaborate in an educational milieu. This includes technological expertise that supplements traditional classroom training with web-based components and learning environments where the educational process is experienced online (Imran 2012). E-

learning is the practice of using information and communication technology to create learning experience that can be formulated, organized and created with ample freedom without any boundaries (Horton, 2006). It is a process where a set of lessons is provided on digital devices like computers or any mobile devices that supports the learning. E-Learning is interactive learning in which the learning content is available online and provides automatic feedback to the student's learning activities. Besides acquiring general knowledge, one of the other main goals of e-learning is to develop professional skills and understanding to help learners to achieve their learning objectives. In an era where educational and technological modernizations are redefining the standards of education, the converging point of interconnection is e-learning.

The basic elements of an eLearning process can be identified as: technological infrastructure, e-learning platform, e-learning content and participants. The two major perspectives/aspects of e-Learning are technological and pedagogical (Devedzic, 2006). The technology including the infrastructure and the platform should enable development, hosting and delivery of e-learning content for its users. The pedagogical aspect concerns the e-learning content and its use for expanding the knowledge of the learners. The two significant modes/types of e-learning are synchronous training and asynchronous training. When both, the instructor and the learner participate in e-learning activity at the same time, via internet is known as synchronous learning. Communication between them can happen in various means such as webinars, instant messaging, video chat etc. Whereas in asynchronous learning, the instructors posts the content in advance then users can engage in web based training at their own pace whenever they need it.

The e-learning activities are important for the development of any country. Soon after independence in 1947, the Govt. of India had the challenge of bringing uniformity in educational system and providing education to large segments of the population. Due to various schemes undertaken by Government of India to improve the literacy rate has resulted in increase in literacy rate from65.38% in 2001 to 74.04% in 2011. E-learning can prove helpful to reduce the illiteracy as the advancement in technology and communication has made teaching and training possible anywhere, anytime. The Learner can learn anywhere; i.e. outside the boundaries of formal classroom (Gaikwad 2016).

2. HISTORICAL DEVELOPMENT OF E-LEARNING

As the origin of the word e-Learning is not certain; it is proposed that the term probably originated during 1980 (Moore, et al, 2011). In this digital Era, e-learning is becoming more viable and approachable. What once was just "Computer based training" now became "Take your class anywhere you go". E-learning can be considered as natural evolution of distance learning. It has always taken advantage of the modern technology to develop and adapt the framework of educational tool for shaping education.

E-learning has its origins from mail-learning method through correspondence courses. Sir Isaac Pitman's mail courses used shorthand technique to teach in 1840. It has said to be the first distance learning course. The concepts remained the same throughout the history, but medium multiplied as the technology developed. Evolution of distance learning can be described as an inconsistent pedagogy method which uses unconventional, conventional and new communication medium to deliver instructional material without any geographical constraint. Since distance education began its course, authors and academics have diverse definitions for it. Content delivery format for distance education have taken various forms such as mail delivered instructions, materials in print format, classes over electronic medium, via mobile devices and now, virtual classes. Distance education has been around for centuries, but it was only since 1960, e-learning has started to evolve

Sidney Presley's concept of 'teaching machines' emerged in 1920's. It was only later in 1950's it was widely popularized by the works of B. E Skinner. As, the cumulative demand for education cannot be met by building more schools and teachers, the teaching machines empowered schools to direct programmed instruction to their students. Later in 1980, the era of personal computers began which paved the way for e-learning. Over the past 50 years a number of new approaches have been in practice to aid the instructor's role in the classroom.

In early 90's CD-based training was considered as the new training technology of e-learning. Occasional workshops were held as a part of CD-ROM based training. More than 95% of the content comprised of Information Technology lessons. Public chat boards were created in websites and it was called "mentoring". Around 1998, Web took over CD based training not only by providing learning instructions and materials over the web, but also by providing a 'personalized' learning experience aided with chat rooms, study groups, newsletters and interactive content (Cross, 2004).

When internet and personal computers became phenomenal and started to flourish in the late 20th century, it was really when the concept of e-learning began to take form. The technology, the concept and the device complemented each other well, providing new learning trend. The first web based Learning management system (LMS) named Cecil was launched in 1996 (Sheridan, et al, 2002). LMS is a software application that organizes, documents, records and delivers e-learning courses. The modern LMS are mainly web based and enable hosting and/or delivering of different types of learning content including but not limited to: reading materials, video and audio, wikis, web conferencing, chats, forums, blogs, learning games, testing, grading etc.

The development of the mobile technology brings a new era in E-Learning known as m-learning. Mobile learning can be defined as the portable and lightweight platform where the learner can engage in learning activity without having any geographical constraint. Mobile phones, smart phones, palmtops, handheld computers, Tablet PCs, laptops and media players are aided in Mobile-learning technique (Kukulska-Hulme, 2005).

Having gone through numerous diverse evolutionary phase, e-learning is still evolving mutually alongside the upsurge in modern technology. Advancement in new technology makes it practical to blend synchronous and asynchronous training into one. Modern e-learning methods are considered to be revolutionizing contemporary learning systems. (Sir John Daniel, 2014).

3. DIFFERENT TECHNOLOGICAL TRENDS OF E-LEARNING

The technological trends of e-learning today are enormous and growing with very rapid pace. In this competitive world everyday some new trend is emerging to provide good learning techniques to the learner (Vivikananda 2017). Among the popular technological e-learning trends some are listed:

I. Mobile Learning:

Mobile learning is the ability of an individual to obtain or provide educational content on personal pocket devices such as PDAs, Smartphone's and mobile phones. These devices with access to internet connection or with the availability of the resources on itself will be a great source of e-learning. Mobile learning has a great role to accomplish the success of e-learning.

II. Blended learning

Blended learning can be defined as the process of combining two or more teaching methods such as web-based technologies, pedagogical approaches, instructional technologies and job tasks. Blended learning technique uses different teaching medium to create a training course for learners. Traditional teaching method and digital teaching method complements each other according to the course needs. The objective of blended learning is to make training media into a combined unit to create great impact.

III. Personalized learning

Rather than relying completely on service providers and expecting to improve the service; personalized learning offers an opportunity for students to partake completely and becoming co-producers in choosing the content and structuring the learning instructions. New pedagogical prototypes, tools and methods which support collaborative learning are developed consequently to the growing necessity and for creating new outlooks. Personalized learning involves authentic and performance modes of assessment, so it can build authenticity and interest.

IV. Continuous learning

Continuous learning or 'Lifelong learning' can be identified as the continuous pursuit for knowledge and expertise for own or vocational purpose. This trend can be defined as the extension of educational facilities beyond the orthodox school ages and to aid education as a tool to improve the eminence of life (Sharma, 2004). It is a profound learning method that is possible only after continuous involvement in a confined learning milieu. The three principles of continuous learning are: the centrality of learner, equality of opportunity, high quality and relevance. Two types of continuous

learning are: Work-based learning which instructs and trains for employment and short-term necessity, Life-based learning coaches for employment and for fulfilled life in the long term.

V. Micro Learning:

Micro learning is a way of teaching and delivering content to learners in small, very specific bursts. The learners are in control of what they are learning and when they are learning. Typically designed and delivered in rich media formats, it is a learner-centric approach that provides just-in-time training that is available on multiple devices. All these aspects ensure that it can be easily accessed, quickly completed, and easily applied by the learners.

VI. Internet of Things (IoT):

It refers to the ever growing network of physical things or objects around us which hold IP address for internet connectivity, and the communication that occurs between these connected objects and other internet enabled devices and systems. IoT can be a great tool for the learners' instant learning for like daily study exercises, daily news or any information study the learner instantly plan to learn. In this kind of technology the learner will be assumed like an object in the whole system, where the system connected will detect the new updated and specific learner IP and gives him all the updates he desires from the whole network of physical devices or objects in which he is connected.

VII. Cloud based E-Learning:

This type of e-learning is creating ripples in the field of education and business. These learning systems are hosted on the internet and can be easily accessed by logging into a service provider's site. Rather than installing all the software and course on user's or learner's computer, the instructional designers will simply use their internet browsers to upload course content, create new courses, and communicate with learners and users directly. This is all done by learner management system, which also gives the designer the ability to store information on the cloud, which can be remotely accessed by other, approved users.

VIII. Gamification:

In e-learning, Gamification is the hot topic today with lots of good reasons. It has proven to be useful in helping learners further comprehend and apply new information they want. This type of e-learning is through games and it really depends on the program and the audience desires. Especially children can benefit more from this kind of e-learning because it create interest in them and make them do again and again for long time.(Hamari 2014). Gamification not only helps online learners acquire knowledge and skills more effectively but also allows them to retain the information to long term memory for the future use.

IX. *Adaptive E-Learning:*

Adaptive e-learning uses computers as interactive teaching devices. This is also known as intelligent tutoring and it has its origin from artificial intelligence and started gaining its popularity in recent decades. Adaptive learning system can be implemented on the internet for use in distance learning and group collaboration. The field of distance learning is greatly incorporating the aspects of adaptive learning. Adaptive learning has been implemented in several kinds of educational systems such as adaptive hypermedia, intelligent tutoring systems, computerized adaptive testing, and computer-based pedagogical agents.

X. *Augmented Reality:*

This technology superimposes a computer-generated image on a user view of real world. It is related to a more general concept called mediated reality. It is really a great boon technology for the students or learners in general. Whenever the learner wants to know more of the things he is seeing in the real world, using a device like mobile phone on which the augmented reality software in enabled, the learner can get all the information regarding the object. This technology needs device, internet and software of augmented reality. This technology has good future in e-learning. This technology has long way to go for making the learners learn the things just by projecting the device. Google glass is a very good example for augmented reality.

XI. *Video E-Learning:*

This kind of learning helps the learner to grasp the content by watching the videos. When a learner wants to get an idea on some specific topic in details he visits the youtube.com for sure. This kind of e-learning gives a very quick idea and helps to understand the things with multimedia affects. Youtube.com is a rich source of video e-learning content and in the same way TV, CD's and storage devices with educational videos paves the way to this kind of e-learning and these days this kind of learning is on full swing as it saves lots of time of the learner compared to reading line by line full stuff on computer or any other electronic device and also it might take little concentration of the learner than to reading stuff. This serves as very effective medium of e-learning.

XII. *Beacon E-Learning:*

This is one more boon technological trend to the e-learning. This beacon e-learning or beacon technology is a wireless device that transmits signals to other nearby devices via low-energy Bluetooth connections. This is used as an Indoor Positioning System (IPS). These IPS beacons can wirelessly locate people and objects within a specific range and then trigger an action on a nearby wireless device. Most importantly this is safe and secure, only accessible through paired applications and easy to download and use. In these modern times almost 99% college students have Smartphone and they can use their phones for effective e-learning.

4. SOME MAJOR INDIAN INITIATIVES

In February 2009, India launched a National Mission on Education through Information and Communication Technology (ICT), which is a billion dollar enterprise. It will provide internet connection to about 20 thousand colleges and other educational institutions. The United Nations Educational Scientific and Cultural Organization (UNESCO) are intended to play a significant role as a global clearing house of ideas and to foster the growth of knowledge based societies. They wish to offer sharing the e-learning materials prepared by India under this national mission by 3 the Indian Institutes of Technologies (IITs) so that all those around who wish to access quality knowledge can do so freely (ASVINA, 2009).

The E-Gyankosh, a National Digital Repository of learning resources, project was started by Indira Gandhi National Open University, in 2006. The repository was developed using DSpace open source software, which ideates to store, index, preserve, distribute and share the digital learning resources of open and distance learning (ODL) institutions of the country. A support to a large aggregation and integration of learning resources in different formats such as self-instructional study materials, audio-video programmes, and archives of radio and television-based live interactive sessions is supported by it.

Inter University Consortium for Technology-Enabled Flexible Education and Development (IUC-TEFED) is the latest initiative of IGNOU which works as a nodal point to undertake all types of collaborative activities involving Open and Distance Learning, new knowledge creation, e-learning, appropriate technology, etc. The structure of Inter University Consortium is on the lines of Pan-African e-Network and the existing consortia of University Grants Commission (UGC), Association of *Indian* Universities (AIU), etc. All the open universities in the country can be its founding members while conventional universities as its associate members. The Non-Governmental Organizations (NGO) and organizations involved in the development of Education and Training, Industry, etc. can also be invited for alliance and partnership. The consortium is expected to facilitate convergence and sharing of knowledge through judicious mix of media and technology (IGNOU IUC Report,2008).

An initiative was launched by CEC known as Learning Object Repository (LOR) which is an Open Courseware initiative having educational resources in different subjects like Archeology, Biology, Botany, Chemistry, Commerce, Computer Science, Economics, Education, English, Fine Arts, etc. The users have the facility to browse the LOR by using various options such as topic, subject, learning object, keywords, etc. The system has grown to 17 (seventeenth) Educational Media Research Centers and Audio Visual Research Centre (EMMRC).

In an another initiative by government of India, a project undertaken by the The National Council of Educational Research and Training (NCERT) in the form of online textbooks showed that e-learning can reach to maximum. The NCERT publishes school textbooks and it has initiated a step towards making school textbooks freely available on the internet for students and teachers through its

website. This portal provides easy navigation to textbook chapters by title/subject of the book for a particular class. The textbooks available there are written in English, Hindi and a few in Urdu (SARMA; MAJUMDER, 2008).

An E-Learning Portal for Awareness Raising on Information Literacy was launched by the Indian Society for the Advancement of Library and Information Science (SALIS), in collaboration with UNESCO in 2006. This project has its genesis in recommendations of a UNESCO supported Workshop on Information Literacy Competency Development for Information Professionals and Special Educators organized in November 2006 by SALIS in Chennai, India, and subsequent Information Literacy sensitization workshops held in Delhi and Nagpur in December 2006. The e-learning portal will cover a number of self-learning modules, such as: Information communication technologies (ICT), Lifelong learning and development of life skills, Information literacy assessment, Information services for disabled people and Freedom of information/Right to information.

Another collaborative project of Documentation Research and Training Centre (DRTC), Bangalore and Goethe-Institut in New Delhi, in 2007, came in the form of Indo-German e-Gurukul on digital libraries to facilitate self-paced learning on digital libraries. Presently this e-learning portal has various modules covering different aspects of digital libraries and has been designed using Moodle open source software. The Indian digital library experts, in collaboration with their German counterparts, have developed the content of these modules.

Another open education initiative is Ekalavya, launched by Indian Institute of Technology, Bombay in 2004. In this project, content developed in various Indian languages is distributed over the Internet. The Ekalavya project has developed an Open Source Educational Resources Animation Repository (OSCAR) that provides web-based interactive animations for teaching. The OSCAR provides a platform for student developers to create animations based on ideas and guidance from instructors. The ekalavya portal is an attempt to generate an interactive platform for the creation, absorption, dissemination and usage of knowledge for the well-being of the individual and the society. It is a significant step forward to bring together students, teachers, and working professionals to meaningfully enhance the productivity of the group and spread knowledge. The Ekalavya portal aims at a free exchange of knowledge and ideas, by placing all the relevant academic material in the Open Source, thus making considerable contribution to society (EKALAVYA, 2004).

In 2002, deliberations of various committees were held that led to the setting up of the UGC-INFONET towards the end of 2004. The UGC also joined this crusade of introducing e-learning. Wholly funded by UGC, UGC-INFONET provides electronic access to scholarly literature available over the Internet in all areas of learning to the university sector in India. The UGC plans to link all Indian universities and Research and development institutes together with a strong intranet network, which will ensure smooth and quick dissemination of information and will be a big step towards Educational Development in the country (UGC,2002).

In July, 2005, the agreement signed between the US and India, 6 (six) leading American Universities representing the US and the Indian Space Research Organization (ISRO), the Department of Science and Technology (DST) along with Amrita Vishwa Vidyapeetham representing India, will participate in a project designed to enhance higher education and research in India through a satellite e-learning network. The beneficiary institutions are IITs, NITs IIIT, BIT Ranchi, and a few other prestigious Institutions across the country.

Another project to provide web based training is the National Programme on Technology Enhanced Learning (NPTEL), which is being funded by the Ministry of Human Resource Development (MHRD). This was first conceived in 1999, to pave the way for introducing multimedia and web technology to enhance learning of basic science and engineering concepts, was launched in September 2006. The 6 (six) major engineering disciplines have been covered in this project so far at the undergraduate (B.E./B.Tech) level.

The NPTEL has developed curriculum based video courses (110 new courses, 109 existing courses encapsulated in digital video format and 129 e-courses web-based). This has been undertaken by 7 (seven) IITs, IISc Bangalore as Partner Institutions (PI) and other selected premier institutions as Associate Partner Institutions (API) through a collaborative effort. The target group for this project consists of students and faculty of institutions offering undergraduate engineering programs in India. It was the first initiative in which all IITs and IIMs shared a common vision and proposed to work together to improve the quality of science, engineering and management education all across the country by offering courses through VCTEL.

The visit of Microsoft Chairman Mr. Bill Gates to India focused, among many things, on bridging the digital divide and kick-starting e-learning initiatives in the country. After detailed discussions, Microsoft agreed to give US$ 20 million for training the trainers in the e-learning program, also known as 'Shiksha'. Under this 80,000 teachers and 3.5 million students would be trained between a period of 3 (three) and 5 (five) years.

The 24x7 learning (2009) inform that the Indian Talent Lifecycle Management Company announced that it is enabling Thapar University, Patiala, and Punjab – one of the oldest and established engineering institutions of India – to provide B.Tech courses through e-Learning mode. Though B.Tech programs for diploma holder working professionals were available through distance learning in India, this is the first time that it is being offered online. The entire program will have around 300 of online classroom sessions to facilitate the learning process. The practical sessions will be conducted with the support of local engineering colleges in major cities across India or at Thapar University, Patiala.

Other State governments like Delhi, Gujarat, Assam, Uttar Pradesh, Arunachal Pradesh, Goa, Jammu & Kashmir, among others, are also in the process of spelling out their IT policies.

5. CONCLUSION

Since the first pioneer systems till present days e-learning significantly evolved in parallel with the development of the Information and Communication Technologies. The real growth and development of the e-learning technologies and methodology started after the introduction of the Web and still is developing coping with the new challenges. At the beginning, the main concerns for the e-learning process were focused on the reliability of the technology that supports it. Nowadays, the focus is on the usability of the platforms and tools and their pedagogical considerations. Our research revealed that the trends that dominate and will further shape the e-learning landscape include but are not limited to: Mobile Learning, Micro Learning, Internet of things(IoI),Cloud based E-Learning, Blended learning, Gamification, MOOCs, Personalized learning, Continuous learning, Adaptive Learning, Augmented Reality, Video E-Learning, Beacon E-Learning and more. The new E-Leaning methods gave open access to information and provided communicative and Interactive features to learners. E-Learning not only does allow students to study when they want and how they want, but it also lets them study where they want. This Flexibility cannot be matched in a formal classroom setting-E-Learning is a boon to the society and it can reach to any part of the world. It is emerging as a future trend of learning in India and has created new dimensions in education, both within and beyond the curriculum and is still looking at further opportunities of becoming more practical.

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