

A Revolution of E-Learning Tools & Its Impact on Higher Education with Special Reference to E-Learning Courses: A Study

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The Asian Conference on Literature & Librarianship 2015
Official Conference Proceedings

Abstract

21st Century is the leading edge of electronic expansion worldwide. It comprises IT, ICT, BT and nano-technology. In this day and age, ICT (Information communication Technology) is considered as an eccentric technology stretched across whole life invariably. The ICT revolution has changed the learning process of childhood up to the real world. The role of technology in the educational sector is increasing at a phenomenal rate and has revolutionized traditional form of teaching –learning processes. In India, globalization has generated a good vibration and life for education. E-learning technological tools such as blogs, wikis, specialized software and YouTube caters to the diverse backgrounds and demands of learners of higher education. This article discusses the broad features of e-tools for e-learning and its benefits in the education field. The paper also explores distinct pedagogic principles which make teaching-learning more effective. Finally, attention is being drawn towards diverse e-learning tools used by the higher educational institutes in India.

Objectives of this paper are:

- To explore the scope for e-learning
- To find out e-learning content preparation and presentation of e-tools.
- To examine the application of e-learning in various types of methodologies used
- To explore the challenges that will be faced by e-learning in India
- To study the future of e-learning and its impact on Higher Education system.

Keywords: e-learning, e-tools, Blogs, Wiki, YouTube

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Introduction

E-learning is a hot topic in higher education and has been growing as a popular topic since the inception of the first web-based courses in the mid- to late 1990s. However, defining “e-learning” is an exercise in frustration for many. There is disagreement as to whether e-learning encompasses online learning, distance learning, hybrid learning, blended learning, all of the above, or not necessarily any of the above; and even these terms, which are said to constitute e-learning, are difficult to define.

It may be necessary, therefore, to operationalize e-learning definitions for each use in the literature, thereby enabling comparisons among studies. For the purposes of this study, e-learning is defined as learning that involves a web-based component, enabling collaboration and access to content that extends beyond the classroom. This definition was provided to this study’s survey and focus group participants to enable conversations and data collection around the topic of e-learning. Although a large part of the study was devoted to online or distance learning, the study also addresses the idea that some e-learning components may enhance traditional face-to-face classroom instruction.

E-learning raises the level of education, literacy and economic development in countries where technical education is expensive, opportunities are limited and economic disparities exist.

“Education is what remains after one has forgotten what one has learned in school.”
--Albert Einstein.

While Einstein’s words may have been intended in good humour, they aptly reflect the fact that effective education is constant and always evolving. In fact, the face of education has experienced a sea change over the decades. Once characterised by the traditional classroom model, education has metamorphosed into learning that is instant, online, self-driven and on the go. The journey of education in India, too, has been dotted with innumerable milestones—the most recent among these is e-learning.

In any society, the imparters of education have a higher moral responsibility to positively influence the student generation. Educators are beginning to realize that to teach future leaders and citizens they need to be technologically better equipped themselves. At the same time, the demand for higher education is growing annually, globally. This increasing complex demands of the new environment challenges educators to devise new solutions and achieve competitive advantage. In spite of various challenges, educators and educational institutions put their best efforts and invest in all possible means to equip students with the required knowledge and skills to prepare them to be competitive and successful. Some of the major challenges include.

- Rapidly changing and increasing demands of a global world and economy
- Increasing diverse student population with different educational expectations and needs
- Changing student demographics and trends
- Increasing demand for accountability from a wide variety of education stakeholders.

- Prepare students for a global academic and economic competition.

E-Learning

E-learning refers to the use of information and communications technology to enhance and/ or support learning. It covers a wide range of tools and technologies including e-mail, internet, video streaming and virtual classrooms. E-learning in context of a student connecting to a network and accessing course material, getting his queries answered and collaborating with teacher and/ or students. Normally this will include asynchronous tools like video streaming and virtual classrooms.

The government is a strong supporter of e-learning and the Department of Electronics and Information Technology (DeitY) has been actively developing tools and technologies to promote it. DeitY has supported e-learning-focused R&D projects at various academic educational institutes. These include content development, R&D/technology initiatives, HRD projects and faculty training initiatives to improve literacy through distance education.

Growth of Higher Education in India

India has one of the largest education systems in the world, with 25.9 million students enrolled. India has more than 36000 Colleges.

Table 1: Growth of Higher Education in India

Sr. No.	Growth	Years	
		1950-1951	2013-2014
1.	Students	397	20 million
2.	Universities	30	700

Source:

Expanding E-Learning

The rapid increase in internet connectivity has been an important catalyst for the growth of e-learning. A robust internet ecosystem, with a multitude of local and global players, will help online learning make further inroads. The story is not limited to schools alone. Indian companies are adopting e-learning platforms as continuous employee learning has become a strategic necessity.

With the number of internet users in India expected to reach 250 million, rivaling the US and second only to China, India's potential as a huge market for e-learning is enormous. A large number of new users are accessing the internet for the first time from their smart phones, which is an ideal, personalized and commerce-enabled platform for e-learning adoption. Universities will see more students accessing their coursework from outside the traditional classroom. As per the Docebo report issued in July 2014, the worldwide market for self-paced e-learning reached \$35.6 billion in 2011. The five-year CAGR is estimated to be 7.6%, so revenues should reach \$51.5 billion by 2016. While the aggregate growth rate is 7.6%, several world regions have higher growth rates. The highest rate is in Asia at 17.3%, followed by Eastern Europe (16.9%), Africa (15.2%) and Latin America (14.6%). According to another report,

India's online education market size is set to grow to \$40 billion by 2017 from the current \$20 billion. India has one of the largest education systems in the world with a network of more than 1 million schools and 18,000 higher education institutions. More than half of the country's 1.2 billion population falls in the target market for education and related services.

Table 2: Country-Wise Internet Usage Statistics (2014)

Rank	Country	Internet Users	1 Year	Penetration	Country's	Country's share of World Internet Users
1	China	641,601,070	24,021,070	46.03%	19.24%	21.97%
2	United States	279,834,232	17,754,869	86.75%	4.45%	9.58%
3	India	243,198,922	29,859,598	19.19%	17.50%	8.33%
4	Japan	109,252,912	7,668,535	86.03%	1.75%	3.74%
5	Brazil	107,822,831	6,884,333	53.37%	2.79%	3.69%
6	Russia	84,437,793	7,494,536	59.27%	1.97%	2.89%
7	Germany	71,727,551	1,525,829	86.78%	1.14%	2.46%
8	Nigeria	67,101,452	9,365,590	37.59%	2.46%	2.30%
9	United	57,075,826	1,574,653	89.90%	0.88%	1.95%
10	France	55,429,382	1,521,369	85.75%	0.89%	1.90%

Source: <http://www.internetlivestats.com/internet-users-by-country/>

Advantages of E-Learning

E-learning brings unique advantages, the prominent being the ability to provide personalized attention to all students. In a conventional set-up, this is only possible when a highly skilled tutor offers one-to-one tutorials. However, considering that most institutions have a classroom-based set-up, such attention becomes difficult. Another advantage is people living in smaller towns and cities can get access to the best possible learning resources from across the world, at a very affordable price. This helps create a level-playing field.

The developing wave of adaptive learning will help students with various levels of intellectual capabilities to glean the best from the learning process at their own pace, without feeling left out. Online tutoring will definitely pose a threat to conventional methods of teaching—while online learning can never look at completely replacing schools because schools offer much more than just academic knowledge inside their campuses. However, private tuition centers will have to take a second look at their business model and adopt digital learning aids to sharpen their offerings.

Aspects of E-Learning

Although the foundation of education is still reading, writing and arithmetic, today's students need broader education. So, what can e-learning deliver?

1. Live Instruction

Certain curricula may require specialised instructors. By using live broadcasts, these instructors can remain in one location and provide instruction to many students in other locations. This type of specialisation increases as students move into higher levels of education, for example towards advanced degrees in medicine.

2. Video Content Delivery

Pre-recorded content such as lectures, documentaries and other video content may be delivered in a store and forward model so that the material can be viewed when needed.

3. Student-to-Student Interactions (Video-Conferencing)

Students may learn just as much from each other as they do from teachers. So communications technology can be used to connect students.

4. Remote Test Administration

In some countries, standardised tests are used to evaluate students on a level-playing field. These tests must be delivered securely and on-time to meet testing schedules. In Indonesia, this is a daunting task simply because of geography and population size. Digital delivery could be the solution.

5. Up-to-Date Materials

Basics seldom change. However, virtually all textbooks must be updated. Textbooks are expensive to purchase, maintain and deliver. Digital delivery solves this issue when coupled with e-readers.

6. Self-Learning

Computer-based training or self-paced learning is common in higher education and trade-oriented learning. Kiosks to support this may be located close to under-served areas where populations already work.

At the higher educational level, collaboration is vital to research. Post-graduate students in remote locations may be able to consult instructors at the university when needed. For example, in the medical field, tele-medicine can only be facilitated using broadband.

7. The VSAT Advantage

Satellite broadband, typically VSAT (very-small-aperture terminal), is ideally suited to bridging this gap. In the past, satellite connectivity was typically thought of as too expensive, too slow and not reliable. With the advent of high throughput satellites (HTS) and advances in radio technology, the cost and reliability of satellite connectivity has made it an attractive option. Satellite broadband offers distinct

advantages such as competitive cost; multicast capability; universal coverage; and low cost and simple installation.

Further, specialised equipment such as digital white-boards, video-conferencing systems, multimedia systems and even 3D learning experiences may be connected to take advantage of the broadband connectivity.

As e-learning tools become more advanced, so does their bandwidth requirement. Depending on which applications are in use, bandwidth requirements can vary from several hundred kbps all the way to multi-megabit connections.

Business Opportunity of E-Learning in Education

In underdeveloped and developing countries, e-learning raises the level of education, literacy and economic development. This is especially true for countries where technical education is expensive, opportunities are limited and economic disparities exist.

Thanks to satellite technology, the costs have come down so significantly that every student—whether a grade school student or medical student doing a rotation in a remote area—can take full advantage of bandwidth provided by broadband satellite systems.

E-learning Initiatives in India in Last Few Years

E-learning is a new technology in the field of education. At present it can support the traditional teaching and learning but it cannot be recognized and accredited. E-learning will suit a country like India which is spread over a vast geographical area. E-learning with its wide accessibility can reach the learners, having a telephone line, a modem, a Net connection and a machine, who are dispersed over a large area. It is sure e-learning is the only way by which we can make India, a knowledge based society.

- In 1984, the Government of India started a project called CLASS (computer Literacy and Studies on Schools). As a result of this project; computer literacy is made compulsory for classes XI and XII. The infrastructure for the computer science teaching, like computers, electricity and other fittings were brought by the respective state governments. In the 7th five year plan 2598 schools & in the 8th five year plan 2371 schools started computer literacy, laying foundation step towards E-learning in India.
- Under the Education Technology Scheme 1987, Audio-software (cassettes) and videocassettes were provided to the schools for training the students. Bihar, U.P, Orissa, Maharashtra, Gujarat, Kerala and Andhra Pradesh started broad casting educational programs through radio and Doordarshan. By the year 1999 the state governments for the primary schools sanctioned 75,903-color televisions. At present, in India, many schools: - both private and government aided: - started computer science as a subject and the schools have augmented the infrastructure with Television, audiocassettes and videocassettes, CD-ROMs etc. In Indian schools, the future development can be attributed to E-training.

- During the year 2003, Indian Government launched an ambitious project of E-learning and E-governance and planned to spend \$2660 million in the next four years. The main aim of this project is to take E-learning to schools in every district across the country. This project, will ultimately cover 6, 00, 000 schools in India. Karnataka State Government launched another major E-learning project in 2003. The Government of Karnataka and IBM India signed a Memorandum of Understanding to promote E-learning within the state. Under the project, IBM will develop an E-learning platform for BITES (Board for IT Education Standards) for higher technical educational institutions in Karnataka. The E-learning platform with the Government of Karnataka will create one such eco-system and develop educational institutions in the state as Centers of Excellence. Next few years will determine whether or not the dream of making E-learning available to our billion strong populations becomes a reality.
- A number of private companies and institutes such as NIIT, APTECH, Institute of Management Technology, Ghaziabad, Gurukul Online Learning Solutions started offering E-learning programmes in various disciplines including computer science and information technology.
- University Grants Commission Higher Education Project – UGC with collaboration of INSAT, started COUNTRY WIDE CLASS ROOMS on 15th August 1984, to upgrade and enrich the quality of education, while extending their reach. In inter university consortium for education communication (CEC) along with a chain of about 20 audio – visual media. Mass Communication Research centers were set up by UGC at different institutions of the countries.
- IGNOU Doordarshan Telecast – Indira Gandhi National Open University started telecasting educational programs from 1991, for distance learners. Now five days a week is telecasted on Doordarshan channel.
- GYANDARSHAN Educational Channel – Ministry of Human Resources Development, Information and Broadcasting Prasar Bharati and IGNOU launched GYANDARSHAN jointly on 26th Jan 2000. It is an exclusive educational TV channel in India; working jointly with SIET, NOS, DST, NCST etc. and at present it transmits educational programs round the clock. The programs from partner institutions are telecast for 23 hours a day and foreign programs for 1 hour a day. The programs of IGNOU, CIET – NCERT are telecast for 4 hours, each, IIT programs for 3 hours, each, CEC – UGC programs for two and half hours and one hour each for IIIT and Adult education.
- EDUSAT provides education to millions of people at their doorstep. It is the world's first educational satellite in India launched in 20th Sept 2004. It enables information to be broadcast in local languages and devoted to long distance learning in India. \
- NPTEL Project: Arguably, the most talked about Indian e-Learning project is the NPTEL project. NPTEL (National Programme on Technology Enhanced Learning) was conceived in 1999 and funded by MHRD (Ministry of Human Resource and Development). Under the project, 7 IITs (Indian Institutes of Technology) and IISc (Indian Institute of Science) Bangalore, worked on the Rs 20.5 crore project from 2003 to 2006, to create 112 video courses and 116 web courses, now total 260 courses (125 web and 135 video) are available. All these courses are on undergraduate engineering topics, and made to meet most of the requirements of an engineering undergraduate program (at any Indian university). These courses are available to students, working professionals and colleges (both

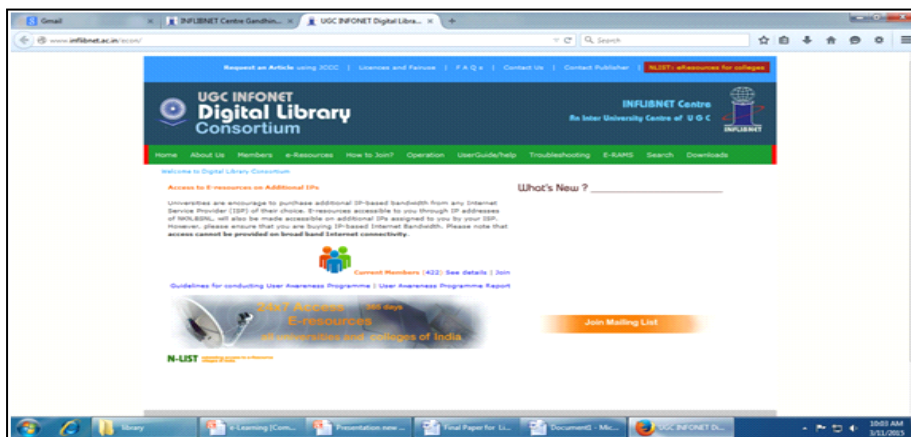
government-aided and private) at virtually no cost or very low cost.506 institutions are using NPTEL Courses as of 26th April 2011.

Figure 1: Screenshot of NPTEL



Source: <http://www.nptel.ac.in/>

Figure 2: Screenshot of UGC Infonet Digital Library Consortium



Source: <http://www.inflibnet.ac.in/econ/index.php>

- Another commercially successful initiative is MBA Programs being conducted for Working Professionals using Satellite Video technology, by institutions like IIM-Calcutta, IIM-Calicut, IIT-Delhi, IIFT, IIT Bombay, XLRI etc. This was done by these institutions using services provided by companies like HughesNet (formerly Hughes Direcway), Reliance Infocom and now NIIT Imperia.
- Premier institutes like IIMs, IITs, XLRI etc provided faculty who take the classes, run the program, ensure quality and institutes provide certificates to students. Institutes spent valuable faculty time and effort in creating and upgrading courseware specifically for these programs during the last 10 years or so.
- Sakshat Portal from MHRD is another well-known e-Learning initiative. Modeled on lines of MIT OCW, it has been designed and developed by IGNOU for

Ministry of HRD, as a repository of eBooks, eJournals, Digital Repository and other student-relevant information. Study material is classified into various topics.

- **E-Gyankosh:** Another related initiative again from IGNOU is eGyankosh – another digital repository for learning resources. It has been developed with the objective of long-term preservation of learning materials.

Types of E-Learning Tools

E-learning is being implemented today in various forms and through various tools emails, blogs, wikis, e-portfolios, animation, video links, specialised software, etc. We can create through these tools a learning situation spread over distance and location that is picturesquely termed as a virtual classroom\ Blogs or individual platforms are increasingly being used by innovative teachers to place educational materials, visuals, exercises, assignments, etc and access made available to select group of persons – students or other learners. This allows comments or questions or answers to quizzes to be put up by students which are then assessed by the teacher administering the blog.

Wiki is a group of Web pages that allows users to add content, similar to a discussion forum or blog, but also permits others to edit the content ([3]). The main difference between Wiki and blog is that there is no inherent structure hard-coded: wiki pages can be interconnected and organized as required. the wiki offers a vast simplification of the process of creating HTML pages, and thus is a very effective way to build and exchange information through collaborative effort.

Educational Benefits of Wiki

Using wikis, students can easily create simple Websites without prior knowledge or skill programming in HTML or current software used for Website authoring, thus

Blog

Blog refers to the term a log of the Web– or Weblog. A Weblog or blog can be described as an online journal with one or many contributors. The word blog is both a noun and a verb. In simple definition it is a Website with dated entries, presented in reverse chronological order and published on the Internet. People who maintain a blog are called bloggers. The act of posting to a blog is called blogging and the distributed, collective, and interlinked world of Strategies for using e-Tools in Teaching, Learning and Supporting of e-Learning Courses: A Selective Study

Educational Benefits of Blogs

The potential benefits of Blogs for Class rooms include the following:

Creative and associational thinking in relation to blogs being used as a brainstorming tool and also as a resource for interlinking, commenting on interlinked ideas; can promote critical and analytical thinking; can promote creative, intuitive and associational thinking;

Potential for increased access and exposure to quality information; combination of solitary and social interaction

The growing popularity of blogs suggests the possibility that some of the work that students need to do in order to read well, respond critically, and write vigorously, might be accomplished under circumstances dramatically different from those currently utilized in education.

Podcasting

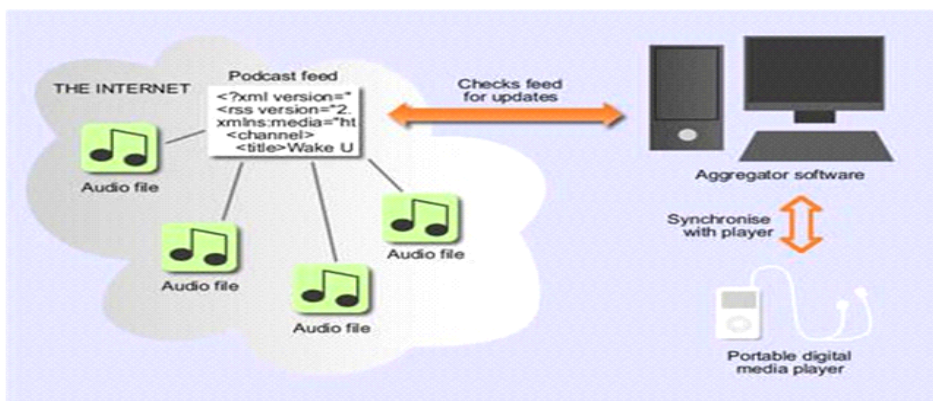
Podcasting is comprised of either audio or video MP3/MP4 recordings that can be downloaded directly to the desktop computer as well as to various mobile devices. A podcast does include digital audio files hosted on the Internet, but it also involves another special file called a FEED which is also hosted on the Internet. This file has a particular format which can be read by the podcast aggregating software and it is this file that allows podcast listeners to SUBSCRIBE to a podcast. Podcast listeners can use any device capable of downloading and playing the digital media including iPods, some mobile phones and most commonly a PC.

Educational Benefits of Podcasting

Podcasting is being utilized not only to provide a repeat or summary of a lecture given but also to provide timely academic material such as law-related news to students. Such usages could create the relationship that is based on continuous communication and interaction between teachers and students by having students engage in academic debate and in accessing timely academic research.

Characteristics of Podcasting

Figure 3: Podcasting: How it Works



Source:

http://www.sddu.leeds.ac.uk/online_resources/podcasting/how_it_works.html

Youtube

YouTube is a popular video sharing website where users can upload, view, and share video clips.

Educational Benefits of YouTube

Video can be a powerful educational and motivational tool. Effective instructional video is not television-to-student instruction but rather teacher-to student instruction, with video as a vehicle for discovery. However, a great deal of the medium's power lies not in itself but in how it is used.

A-View

India's own A- View is another techno-tool that can be converted into an effective PLN. Developed by Amrita university, is part of Talk to a Teacher program led by IITBombay .The technology provides a number of innovative facilities to the teacher as well the learner. These include, Interactive chat Board, Digital White Board, 2D,3D, and also Video sharing, Desktop and Application sharing, Library and Quizzes and poll.

Wiz-IQ

Is a major online virtual learning platform that has caught the imagination of many educators. It can be used without any installation and works on any operating system, and also switch between multiple tabs of the online white board

Benefits for Faculty and Students

E-learning initiatives help meet students' demands for increased flexibility, an enhanced learning experience, and decreased time to degree. E-learning can also help improve or revitalize faculty teaching

Flexibility

The greatest benefit e-learning offers students is increased flexibility, both in course offerings and in access to course resources. Changes in work or family circumstances often leave students unable to take courses on campus or on a set schedule. When courses are offered online, students can often access lectures and other course materials on their own schedules. This enables institutions to retain many nontraditional (or post-traditional) adult, working, continuing education, and military students.

Improved and Revitalized Teaching

E-learning initiatives nearly always involve course redesign. Instructors often must undergo training before teaching online courses, and improved pedagogy results when new techniques are introduced and there is a concerted effort to specify learning objectives or outcomes. Because academic leaders and faculty have concerns about quality, online education is often more open to scrutiny. Therefore, instructors and

course designers spend more time to develop a structured, high-quality experience for students, often using standards such as Quality Matters.

Pedagogy and E-Learning

- Learning and collaborative/co-constructive pedagogies go together.
- The dynamics of classrooms change when e-Learning is part of the regular learning environment.
- Using collaborative, interactive pedagogies that also foster co-operation, appear to lead to effective learning and better teacher/student relationships over time.
- Technology in classrooms becomes an effective tool when teachers deliberately use them in relation to appropriate and targeted pedagogical practices.
- Preventing access in schools to mobile technologies or firewalling some sites does not teach effective and critical uses of these technologies that students have ready access to outside of school.
- Virtual worlds and gaming have potential in compulsory education. They are already used widely in medicine and aviation and other tertiary learning environments, and are increasingly being used in business as part of research and development, as well as employee induction.

ICT and E-Learning

Technology is a major force for change. It is a dynamic subject that is continuously producing new ideas and development. However, the adoption and effective use of technology in learning operates to a different timeline. As young people enter adult education they will expect technology to be both available and employed to assist their learning. However, adult education includes a wide range of learners with other expectations and a work force with varying skills not only in ICT but also in e-learning pedagogy. A large part of the population does not have access to or the skills to use ICT . Digital inclusion is not simply about access to technology it involves meaningful access, technical skills and information literacy. There is considerable interest in the potential for individuals to become independent learners through the use of technology but this assumes a sophisticated learner and at the moment probably only a tiny proportion of learners have the required skills, knowledge and attitudes.

Future Challenges

ICT and e-learning provide a wide range of challenges including:

- 1. Staff Training:** the need to ensure the educational workforce has the e-learning and technical skills to employ technology effectively.
- 2. Equality of Opportunity:** the need for the whole of adult education to be able to offer access to, support with and effective use of ICT. At the moment there are major differences across the different sectors that make up adult education.

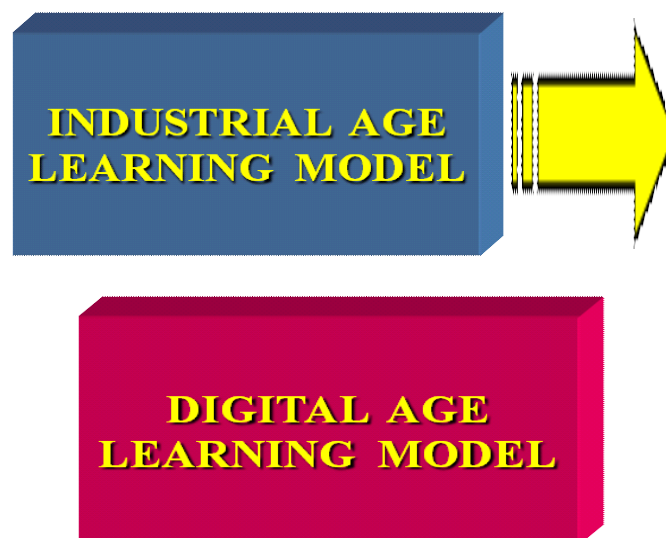
3. Learners Skills: for individuals to benefit from the potential of technology they require not only technical but also learning skills and information and media literacy. These are often not considered in policies or strategic developments.

4. Dynamic: the rapid and continuous change means that policy must be reviewed regularly and programmes sustained. Time limited initiatives are likely to be insufficient to realize the full benefit of technology.

5. Trends: ICT and e-learning are difficult areas to predict beyond the immediate future except that change is inevitable and is likely to impact on where, when and how education is provided.

Learning Models will Need to Change

Figure 4: Learning Model of E-Tools



- How do people learn in a digital environment?
- Is e-learning effective?
- Are learners ready?
- New learning model are needed

Benefits of E-Learning

1. Convenient

- self-service (mix and match)
- on-demand (anytime, anywhere)
- private learning
- self-paced
- Flexibility: (modular package)

2. Media-rich

- Easier to understand & more engaging
- Repeatable- As many times as you like

- Easier to monitor progress
- less administrative work & can be precise

3. Cost-effective

- Virtual
- Earning environment
- Share lessons among Others
- Reduce material cost/ travel/accommodation costs

Conclusion

The various types of e-learning tools have been developed to cater to the needs and of diverse nature of learners. The benefits of various tools like connectivity, flexibility, interactivity have been outlined. However, one should be careful in the use of these tools so that learners do not feel overwhelmed by the upgraded technology. E-learning tools should integrate the pedagogic principles with the learning theories. While e-learning has come to stay in today's educational environment, one should be careful in its use so that teaching-learning becomes effective, interesting and encompasses the diverse range of students' backgrounds and abilities. ICT and e-learning are often described as having the potential to enable learners to learn at anytime, anywhere and at their own pace. However, achieving these results is not simply about access to technology. It is also about the competent users of technology, having e-learning skills and being media and information literate as almost a quarter of the population do not use ICT. The main concern is to motivate the users to realize the relevance of ICT in their lives and giving them meaningful access. Motivated people will in turn acquire the required ICT skills. Technology is a major change factor and must therefore be considered in all discussions of education and training policy.

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