

Overview of E-Learning in India

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ABSTRACT

E-learning composes all formats of electronically supported teaching and learning methods. The information and communication systems, whether it is network-oriented learning or not, serves as a specific media in the implementation of learning process. E-learning emphasizes the network-enabled and computer for transferring of skills and knowledge's. Applications and processes of E-learning include computer-based learning, Web-based learning, digital collaboration and virtual education opportunities. This paper reflects Overview of E-Learning in India.

1. Introduction

E-learning composes all formats of electronically supported teaching and learning methods. The information and communication systems, whether it is network-oriented learning or not, serves as a specific media in the implementation of learning process. Most likely, this term will be use to refer via technology, in-classroom and out-of-classroom educational experiences, though development continue in regards to curriculum and devices.

E-learning emphasizes the network-enabled and computer for transferring of skills and knowledges. Applications and processes of E-learning include computer-based learning, Web-based learning, digital collaboration and virtual education opportunities. Contents are distributed via the Internet, Audio/Video tape and Satellite TV. It can be instructor-led or self-paced and include medium in the format of text, animation, image, and streaming of Audio and Video.

E-learning is also synonym as CBT (Computer-Based Training), IBT (Internet Based Training) or WBT (Web-Based Training). Nowadays, still discover anyone can find these keywords being used, accompanied with different forms of E-learning. These terms will be used throughout this paper to show their validity under the broader terminology of E-learning.

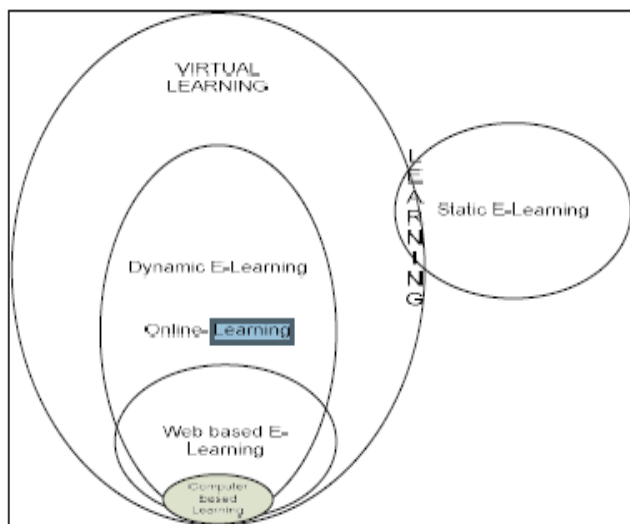


Figure 1.1: Technology Dimension of Learning Process

- **E-Learning is simply web-based training-** There are no CDs or software to install on your computer. All you need is a web browser (such as Internet Explorer or Chrome/Mozilla Firefox etc) and internet connection. Training professionals like Watch, listen and learn demonstrate each lesson right on your computer screen.
- **Always available -** All of our courses are available 24x7 hours, i.e. 24 hours a day, 7 days a week. Once you purchase your subscription, simply login for instant retrieval to your courses. Our courses are designed by software training professionals with years of classroom training experience. Learn at your office or home - at your own pace or footstep.
- **Comprehensive -** Includes all the topics covered in classroom trainings.
- **FREE access to e-manuals -** Your subscription includes access to classroom e-manuals (in PDF), along with practice exercises & keyboard shortcuts. Customize your training with the easy-to-use menu.
- **Clear, easy-to-follow, step-by-step instruction-** view the training period as much as you want while practicing in your software and creating it the most realistic practice available.
- **The best & most appropriate way to learn on your own -** at a fraction of the price of classroom training. The confidence in knowing your training was created by software training professionals.

2. Scope of E-learning

Online education goes behind the principality of secondary, higher-secondary and tertiary education. Also, it includes modules and courses for professional skill enhancement and competitive exam preparation, and other various non-academic subjects.

Key categories of online education	
• Primary and secondary supplemental education	Supplement to school learning for students enrolled in primary and secondary classes in school
• Higher education	Provide an alternative to traditional higher education courses
• Test preparation	Online programmes aimed at coaching students in preparation for competitive examinations
• Reskilling and online certifications market	Courses designed to assist users in skill enhancement, which may result in certifications
• Language and casual learning	Learning of non-academic subjects such as spoken English and playing guitar

Fig. 1.2 : Key Categories of Online education

3. Market analysis of E-learning

According to conservative estimates, E-learning industry in the worldwide is considered to be worth \$48 billion. In this internet and multimedia technologies, expansions are the basic designer of E-learning using the content, consulting, support, services and technologies which is being recognized by the five primary parts of the industries of E-learning [Jochheim, 2008].

3.1 Higher Education

In the United States, 3.5 million students were taken part at higher education institutions in online learning by 2006. As per the Sloan Foundation reports, there has been a growing of around 12–14 % per year in enrollments on average for fully online learning over the 5 years from 2004–2009 at post-secondary system in US compared with of approximately 2% on average increasing per year in overall enrollments.

In India, the market research report of online education gives market segmentation by end-user (and K-12 segment and higher education segment) and by product (services and content). It also provides an extensive analysis of the leading factors motivating the market, including industry-specific challenges, drivers, opportunities and trends.

From the two main products, the content segment holds the greatest market share in 2017, presenting to over 64% of the market share. This segment of product will oppress the global market throughout the period of projection.

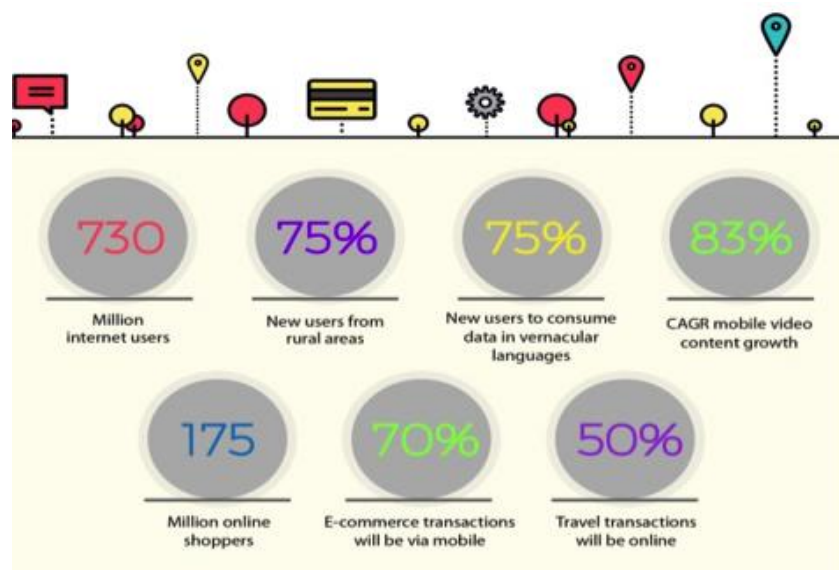
According to the recent report, the E-learning market size of India was USD247 million, including 1.6 million users in 2016. By 2021, it is estimated an 8X rise to reach USD1.96 billion and the recent user base will rise at 44 % of CAGR to 9.6 million users.

In fact, by 2020, E-learning market of India is the second greatest after the US which is estimated to rise by 15.64 % and exceed \$48 billion.

In India, the online education is increasing at a rapid pace owing to the following factors:

Growth of internet and penetration of smartphone

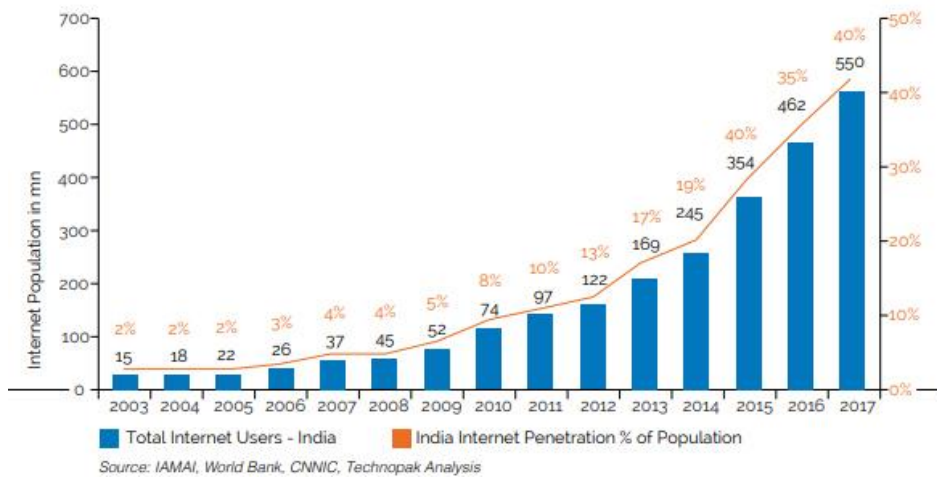
The number of users in internet is estimated to reach 730 million by 2020, almost double from what it is today at 432 million with a penetration of approximately 40%, a significant increase from the current 35%. India may succeed China to have the second greatest users after the US.



1.3 : The Internet in India by 2020

Also, India is the world’s third greatest smartphone market with a number of users approximated to gain 369 million by 2018. At present, it is also approximated that at the end of

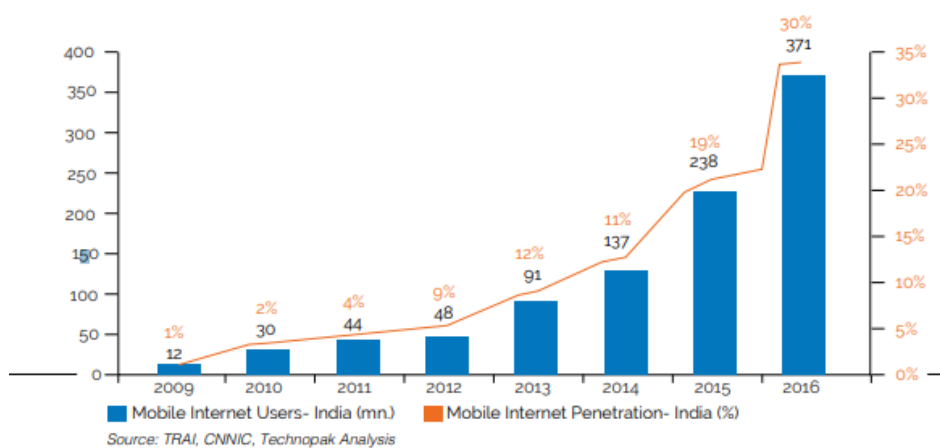
2017, mobile users using internet will cross 300 million from 159 million users.



1.4 : Internet User's growth in India

According to Strategic Analytics Survey reported by 2016, India pass Japan to become the world's third largest 4G LTE market. By 2017, it will also exceed US to become the world's 2nd largest smartphone market. Due to the decreasing selling price, there is a global assumption of smartphones concluding in a large surge in the number of mobile internet users in India.

India is estimated to have 371 million mobile users using internet by 2016. Mobile internet users have seen much faster growth as compared to broadband users. This growth is expected to continue given the increase in the penetration of high-speed Internet, driven by 3G and 4G (more recently) wireless technology.



India's user internet-based increased by 49% in 2015. Mobile internet is mainly responsible for this rise with 94% of users availing the Internet with the use of their mobile phones in urban India. 65% of the traffic of internet comes from mobile phones.

In distance courses learning, the internet offers a vast accessibility to enroll for the young demographic (15-40 years). They are the most dynamic customers of smartphones and internet, and those customers are more likely be searching for online learning modules/courses to complete their requirements of education instead of having to transfer from home, city or office, and spending extortionately.

The education market of India, recently approximated at US \$100 bn, is supposed to reach US \$180bn by 2020. India

has one of the greatest education systems in worldwide. It has the world's greatest population appearing classes at school, an age between 6 to 17 goes about 310 million. A typical Indian student is introduced to formal education at the age of five. The Right to Education (RTE8) Act gives compulsory and free education for all children in the age group of 6 to 14 years as a fundamental right. According to the University Grants Commission (UGC), in 2016, India will hold to 751 universities and over 35,539 colleges. The distance education system provides a quarter of student's enrollments in the Higher Education System, with over 29 million students enrolled in the Higher Education Systems in India.

	Schooling	Higher Education	Vocational Education & Skill Development	Ancillary Segments
Segments	Early Childhood Education (Pre-schools)	Graduation (General & Professional)	Vocational Education in Manufacturing	Test Preparation and Tutoring
	K-12 Schools	Post Graduation (General & Professional)	Vocational Education in Services	Content: Textbooks and e-Learning
		Research (PhD.)		Allied Services etc.
Market Opportunity	Market Size: \$52bn	Market Size: \$15bn	Market Size: \$5bn	Market Size: \$28bn
	CAGR: 14%	CAGR: 20%	CAGR: 20%	CAGR: 22%
Regulations	ECE: For Profit K-12: Not for Profit	Not for Profit	For Profit	For Profit

Online education supplier is now growing to the abundance instead of incurring administrative investment’s cost or setting up an infrastructure physically or such as stationery,

books, staff salaries, etc. Hence, the savings cost is proceed to the users.

The E-learning can complement the traditional model, and fulfil the gap to substantial extent.

Educational Infrastructure		
Schools (K-12) 1.5 mn	Colleges: 35,539 Universities: 751	Vocational Training Centers 22,000
Govt. 1.1 mn Private 0.4 mn	Govt. 8,000 Private 28,283	Govt. ITI: 2,571 Pvt. ITI 9,673 Polytechnics: 9,900
No of Students: 260mn	No of Students: 29mn	No of Students: 4.5mn
Annual Intake 18 mn	Annual Intake 5 mn	Annual Intake 3 mn
Additional Capacity Required 40 mn	Additional Capacity Required 20 mn	Additional Capacity Required 20 mn
Additional Requirement for Teachers- 2 mn	Additional Requirement for Faculty- 1.7 mn	Additional Requirement for Trainers- 1 mn
Additional Resources US\$60 bn	Additional Resources US\$100 bn	Additional Resources US\$40 bn

1.5 : Educational Infrastructure

The additional capacity requirement in the K-12 segment is 40 million. There is an additional capacity requirement of 20 million in both higher education and vocational training segments. While digital learning cannot replace the conventional brick & mortar model of education, it can supplement it by filling in the existing need-gaps.

3.2.K-12 Learning

In the current years, the aspects of K-12 learning has experiences a service and yet the journey has begun. Many rising form of digital learning , including learning management systems, interactive games and hands-on learning methodologies, have eliminate the landscape with the assurance of expanding learning outcomes and experiences.

Students from primary classes to Class 12 are now actively accessing apps and websites in their search for

outstanding tutors. In the previous few years, the approach of the student, teacher and parent’s solidarity in India is swing towards the world online, especially in semi-urban and urban in India.

The system of K-12 education is about assuring the basic primary education to students from Kindergarten to the 12th grade standard. Many countries adopt this system as a mandate. Also, in India, schools are squeezing K12 education model to set with the conception of the Right to Education (RTE) and Sarva Shiksha Abhiyan (education for all). The most important attribute of K-12 process is categorizing the whole period of a student's school journey, into three phases — Kindergarten, Middle, Senior.

In India, the K-12 sector can be divided by board of affiliation, levels of education and ownership. In India, 25% of all K-12 schools are owned privately, therefore by accounting

for 40 % share in student's enrollment. 54% of all 1.46 million K—12 schools in India are controlled by the Central Government / State Government, 21% are controlled by Municipal corporations while for 25% of private schools account from whole number of K-12 schools in India. In regards to the affiliation, in India, 96% of K-12 schools are affiliated to state boards, 1% to CBSE, 0.1 % to CISCE and 2% goes unrecognized. In regards to the boards of India, a huge number of schools across are tie up with International Boards.

The K-12 model is within those revolutions that Indian education system has widely accepted and made it necessary to acquire for both government and private schools. In K-12, there is a lot of student-teacher interaction where the teacher inspires a lot of assignments and question-answer sessions to develop learning habits in students. This education system provides attention of individuals. This method is more into developing the self-educating capabilities in students. Here the students are motivated to combine values to their assignments in the formal of personal ideas and views that makes this system more beneficial than the conventional education systems. Students are also open to taking participate in various discussion clubs and forums to present their ideas and views.

3.3 .Corporate

E-Learning has now been adopted and used by various companies to inform & educate both their employees and customers. Large companies with their spread-out distribution chain use it to trained their sales staff to get knowledge about the latest developments of product without the requirements of organizing physical courses. Also, consent has been a big field of rise with banks with the use of it to take their staff's CPD's level up. The specialized companies in this discipline includes likes of In Style Creative and Epic.

4. Approaches To Integrating Simulations With E-Learning Tools

As computers were primarily used in education, development of E-learning services become preferable. There is always a tendency to move towards services blended learning, where activities based on computers are combined with classroom based or practical situations. According to Bates and Poole (2003) and the OECD (2005), different kinds or forms of E-learning can be observed as a continuum, from no E-learning, i.e. without using of computers and or the Internet for learning and teaching , based on the classroom aids such as making PowerPoint slides, classroom lecture available to students, through a learning management system or web site based course , to handheld devices or laptop programs where students need to bring laptops in to class and use them as a part of face-to-face class, to hybrid learning where time is reduced for classroom but not eliminated, with more time given to online learning, through to completely online learning, which is a formation of distance education. This classification is quite related to that of the Sloan Commission reports based on the E-learning, which refers to web supplemented, web dependent and web enhanced to consider growing intensity of technology used. Based on the Bates and Poole continuum, 'blended learning' can includes laptops,

hybrid learning, classroom aids, while 'distributed learning' can include either fully online learning or hybrid.

4.1 Computer-Based Learning

Computer-based learning (CBL) is used for any type of learning using computers. Computer-based learning provide use the elements of interaction of the software and the applications of computer and the capability to represent any kind of medium to the learners. With many benefits of Computer-based learning, the benefits of learning users at their own pace and also learning in absence of an instructor to be physically present.

Computer-based learning is also called as computer-aided instruction.

Computer-based learning give refers using the computers as a main element of the environment of education. While this can also refers using the computers in a classroom. Broadly, this term can more refers to a well- structured framework in which computers are used for the purposes of teaching.

4.2 Computer-Based Training

Computer-Based Training (CBT) require the use of a networked or personal computer for the access and delivery of training programs. CBT can be asynchronous and synchronous, also web-based, mobile, online and distance learning. CBT is especially helpful when training learners on a particular computer application, but also can be made to train the learners on general skills and knowledge. The greatest limitation of CBT is that it is costly to deliver and develop, generally for small students' group. CBT would be more cost-effective when it is built to provide training to a vast number of students.

CBTs gives learning stimulus behind the conventional learning methodology from learning materials, textbook, or classroom-based instruction. For example, CBTs provide solutions to user-friendly for satisfying regular requirements of education. without giving chances to limiting students to reading printed materials or attending courses, students are enabled to acquire skills and knowledge through the methods that are much more beneficial to preferences of individual learning. For example, CBTs provides benefits of visual learning through video or animation, not typically provide by any other means.

An alternative of CBTs is printed-learning materials since growing media, including animations or videos, can easily be attached to improve the learning procedure. Another benefits to CBTs is that it can be well transferrable to a vast audience at a comparatively low cost immediately after the starting development is finished.

4.3 Computer-Supported Collaborativ E-Learning (CSCL)

CSCL is mainly concentrated on how collaborative learning with the support of technology can increase work in groups and peer interaction, and how technology and collaboration enable distributing and sharing of expertise and knowledge within the members of the community." (Lipponen, 2002). Computer-supported collaborative learning (CSCL) is mostly an optimistic revolution to enhance learning and teaching with the use of current information and communication technology. In the present-day, in CSCL, most developments have been called E-Learning 2.0, but the concepts of group learning or collaborative however an instructional method are

designed to motivate students to work cooperatively on learning of tasks has existed long time. Comparing to the conventional 'direct transfer' methods with the collaborative learning, it has been seen that the instructor is supposed to be the transferring of skills and knowledge, which is generally given the neologism E-Learning 1.0, despite the fact that, direct transfer method is more exactly reflects as to Computer-Based Learning systems (CBL).

4.4 Technology-Enhanced Learning (TEL)

The word Technology-enhanced learning (TEL) is used to represent the application of technology to learning and teaching. In other words, TEL is a technology that expanded the learning experience. This term can be used to represents both digital and analogue technologies, but currently, we have seen that digital TEL is proceed over education with the format of different types of educational software. TEL is transforming and improving educational institutions and education beyond recognition. Therefore, it is absurd to be ignore.

The main objectives of Technology enhanced learning (TEL) is to gives socio-technical innovations (also enhancing cost effectiveness and efficiency) for practices of E-learning, respecting organizations and individuals ,irrespective of place, time and pace. Therefore, the domain of TEL concerns with the help of a learning activity using technology.

5. Benefits of e-learning

There are many benefits of E-learning to computer-based and online based learning when compared to conventional face-to-face learning.

Flexibility, Accessibility and Convenience

Learners can progress along with a training program "at their own place and at their own pace." They can obtain the E-Learning courses as much as they require and at any time they want. This is also referred as "Just in time and just enough."

Consistency and Scalability

E-Learning allows educators to receive a vast range of area to distribute the message in a uniform way for their target pupils. This confirms that all learners are getting the similar kind of training using the learning model. E-Learning helps in communicating and making new training concepts, policies and ideas. Whether it is used for formal education or entertainment, E-Learning is a very fasted way of learning.

Support Cross-platform

Courses of E-Learning can be access by Web browsers on any platform: Mac, OS/2, Windows, UNIX, Linus, Amiga, etc. Anyone can deliver their training program to any machine over the Internet without having to specific author to a program for each platform.

Browsers and Internet Connections are Widely Available

Most of the computer users have access browser such as, Chrome, Netscape, Internet Explorer, Mozilla Firefo, and are connected Internet and/or have access to the company's intranet.

Worldwide Distributions are Inexpensive

No particular means of transmission mechanism is needed. E-Learning courses can be access from any computer and anywhere in the worldwide, which stores cost of delivery to be low.

• Updates are easier

After the release of E-Learning courses, updates can be easily made on the server who are releasing the program and at the same time everyone can quickly access the updates in the world. Whenever the E-Learning courses run, the courses can be designed to be access by a selected recent information, such as the latest specifications of product, from any other server worldwide for an on-the-fly update.

• Savings in traveling time and cost

There is not necessary to traveling costs to bring remote employees to a centralized workshop, because the Web is always available from all desktops. According to analysts, the exact time needed by computer for training approximated up to 50% to that of instructor-led training, which is further saving the money.

• Less Impact on Environment

As E-Learning is a way of learning without paper, it saves the environment to a lot of expanse. As per a research done on E-Learning courses, it has been reported that distance-based learning programs take around 90% less power and produce 85% less amount of CO₂ emissions as related to conventional classroom-based educational courses. With E-Learning, for obtaining paper, there is not required to cut trees. Thus, E-Learning is a greatly eco-friendly ways of learning i.e. not harmful to the environment.

6. Limitations of static e-learning

- E-Learning depends on technology a lot
- Some finds it hard to organize and motivate themselves
- Some students might feel isolated
- The feedback might not be enough

The other limitations of online or computer-based learning are as follows:

- Learners with low interest or poor study habits may fall behind.
- Without the structures of schedule of a conventional class, students may lose or unclear about course deadlines and activities.
- Students may feel solitary from the classmates and instructor.
- When the students are learning online or they need help, they will not get any instructor available always.

7. Contemporary Trends In E-Learning

The emerging attentiveness in E-learning seems to become from various directions, including organizations that have conventionally produce distance education programs in a single, dual or mixed mode setting. They see the inclusion of online learning or through Internet learning in their repository as a rational increase of their distance education scheme. In the other way, the corporate sector is more focused in E-learning in a way of justifying the cost of their existing staff training scheme. E-learning is also be interested by residential organizations of campus-based educational institutions. They notice E-learning is a way of enhancing programs access to them and also is a way of tapping into rising niche markets.

The rise of E-learning is directly associated to the enhancing access to information and communications technology with its decreasing cost. The scope of Information

and Communications Technology is also suitable to the increasing interest in E-learning to assist multimedia resource-based teaching and learning.

Growing number of teachers are growing using Information and Communications Technology to support their teaching.

Although, in E-learning this degree of interest is not with the constraints and limitations. The basic difficulty to the increase of E-learning is insufficient access to the infrastructure of required technology.

The technological trends of e-learning today are enormous and growing with very rapid pace. In this combative world, everyday various latest trend is increasing to gives well learning methods to the learner, throughout the regular technological e-learning trends, some of which are listed below:

1. Mobile Learning:

Mobile learning has the capability of a person to observe or gives educational content on personal pocket devices such as mobile phones, PDAs and Smartphone's. These devices along with access to internet connection or with the availability of the resources on itself will be a great source of e-learning. Today everyone has smart mobile phones on which huge memory and faster internet availability can be retrieved and this provides the user to study anything they want it in anywhere and at anytime. Mobile phones are considered to be best platform for e-learning because:

- Potential to reach masses.
- Carried all the time.
- Easy to use.
- Cheap.
- Just in time learning.

2. Micro Learning:

Micro learning is a way of delivering and teaching materials to learners in a small, very specific burst. The learners are in control of what materials they are learning and when they are learning. Typically, developed and distribute in the form of rich media, it is a learner-centered approach that gives training of just-in-time trainer which is accessible on multiple devices.

4. Cloud based e-learning:

This type of e-learning is making lap in the domain of education and business. These-learning systems are present on the internet and can be accessed easily by signing into a service provider's site. Instead of installing all the courses and software on learner's and user's computer, the instructional designers will directly use their browsers to create new courses, to upload content of courses and communicate with users and learners directly. These are all done by learner management system, which also gives the designer the capability to store information on the cloud, which can be accessed remotely by approved users and others.

5. 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 creates

interest in them and make them do again and again for long time. Gamification is not only providing online learners to take skills and knowledge more efficiently but also it provides them to keep the information and accomplished it to long term memory for the future use.

6. Adaptive e-learning:

Adaptive e-learning uses computers as an interactive teaching device. These methodologies arrange the allocation of mediated resources and human in accordance with the unique learning requirements of individual learner. 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 performed on the internet for use in group collaboration and distance learning. The domain of distance learning is mainly integrating the features of adaptive learning. Adaptive learning has been developed in several types of educational systems such as intelligent tutoring systems, adaptive hypermedia, computer-based pedagogical agents .and computerized adaptive testing.

7. Augmented reality:

This technology superimposes a computer-generated image on a user view of real world. It is connected to a more common 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. This technology has just introduced in 1962. Google glass is a very good example for augmented reality.

8. Video e-learning:

This type of learning provides the learners 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.

9. 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 distribute signals to nearby devices through low-energy, Bluetooth connections. This is used as an Indoor Positioning System (IPS). These IPS beacons can wirelessly find objects and people within a particular range and then stimulate an action on a nearby wireless device.

8. Artificial Intelligence:

This technological trend can be a big shaper to e-learning world. Artificial Intelligence and robots are not same things. It is something like intelligent software which is designed to take some intelligent actions reading entire environment around it. This can produce a very good instructor which helps in making individual and every student a good expert in their own field.

Some latest outcome in artificial intelligence learning instructors are like SIRI and VIV, these are software which will answer simple queries to much complex queries of the learners. The involvement of artificial intelligence in e-learning provides the learner to bring a wise decisions and quality resource, which in turn provides the learner to make and excel his achievements at faster phase.

9. Opportunities And Affordances Of E-Learning

Although such type of learning designs are suitable for any teaching and learning context/media, their efficiency and effectiveness can be slightly constrained by the space, fixed time and pace limitations in conventional campus-based classroom settings. Similarly, while printed study materials afford transportability, they are also limited by their inability to capture and carry as much else other than pictures, text, and illustrations. Information and communications technologies, on the other hand, afford us a wide range of opportunities to

capture, store and distribute information and resources of all types and formats.

Besides the pictures, text and illustrations, these includes multimedia-based simulations of complex processes from all types of domains like agriculture , biological and medical sciences, educational practice and engineering which are not easily or cheaply available in real time settings.

10. Conclusion

The main contributions of this thesis are the exploitation of **Dynamic E-Learning** to enhance an E-Learning Management System where the e-Learning is viewed as part of more general framework. It will benefit eLearning developer in designing an E-Learning system in the point of view simulation as broader architecture. It also benefits for education practitioner to implement social constructivist pedagogical approach in a courseware.

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