

Revolution of E-learning (Current and Future Trends in E-learning, Distance Learning and Online Teaching Learning Methodologies)

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Abstract—Due to tremendous inventions in internet technology the whole teaching learning methodologies have been changed. The traditional education system which was fully dependent on the class room teaching learning process and it was named as “Madrasa” or “Gurukul”. This trend was slowly changed to postal coaching in 1970’s. Due to invent of internet and other technologies abrupt changes have been made in teaching learning process. Now a new concept with great influence has come up which is Education for all, anywhere, anytime. This paper will focus on the new innovative teaching learning methodologies and also its importance in coming days. In this paper, I have tried to explore a comparative study among e-learning, distance learning and on-line learning methodologies and how ARM technology can improve the teaching learning methods by reducing the H/W cost.

Keywords: e-learning, distance learning, on-line teaching learning, teaching methodologies, education for all.

1. INTRODUCTION

E-learning or electronic learning typically means that using a computer to deliver part or all of a course. It may be in a school, part of your mandatory business training or a full distance learning course. In early days many people thought that by bringing computers into the classrooms would remove the human element that some learners need but with the passage of time technology has developed and now we embrace smart phones and tablets in the classrooms and offices as well as using a wealth of interactive designs that makes distance learning not only engaging for the users but valuable as a lesson delivery medium. The perfect blended learning environment is provided by the Virtual Colleges to offer anyone the chance to take their online training to the next level by building partnerships with quality training providers and combining this with a dedicated experienced technical team and support staff.

E-learning, online-learning, distance-learning are the common terms to define online-learning. Distance learning is a way to deliver education to the students who are not able to present in

regular classes. Distance learning provides learners (students) a way to learn when they are separated by time, distance or both from accessing information. In distance learning there is no need of physical presence of learner. A campus based institution which may offer courses using e-learning should entirely bounded by internet or other computer networks. E-learning can be defined as an education which is using a process to learn with the help of different electronics applications. E-learning delivers information using various types of media which includes audio, image, animation and video. In addition some applications are also used such as video file, CD, DVD, internet etc. Online-education is a mode of providing education over internet. The above ways of delivering education are somehow related to each other. When learners are far away from educational institutions or they are not able to get education on regular basis due to some personal reasons but eager to learn then the above mentioned modes come into existence. E-learning can be used in or out of the classrooms. E-learning is useful throughout the world, especially in a country like India or China where population is very high, this type of teaching learning methodologies are very much essential. It is assumed that after 15 to 20 years from now the conventional education system will be almost irrelevant as most of the learners will not get admission in conventional educational Institutes. So therefore, the people will be forced to take education through these alternative modes.

2. CONSEQUENCE OF DISTANCE LEARNING

Distance education is the most renowned descriptor used when referencing distance learning. Distance learning is an effort to provide access to those learners who are geographically distant. During the last two decades, the relevant literature shows that various authors and researchers use inconsistent definitions of distance education and distance learning. A proposed definition identified the delivery of instructional materials, using both print and electronic media when computers became involved in the delivery of education.

The delivery of lectures includes an instructor who was physically located in a different place from the learner and will providing the instructions at disparate times. Dede (1996) elaborated on the definition by including a comparison of the pedagogical methods used in traditional environments and referring to the instruction as “teaching by telling.” The definition also stated that distance education uses emerging media and associated experiences to produce distributed learning opportunities. Both these definitions recognized the changes that were apparent in the field and attributed them to the new technologies that were being made available. Keegan (1996) went further by suggesting that the term distance education is an “umbrella” term, and as such, the terms like correspondence education or correspondence study that may have once been synonymously used and these are important subparts of the distance education. King, Young, Drivere Richmond, and Schrader (2001) do not support the interchangeable use of the terms distance learning and distance education, because both terms are different. Distance learning is referred as ability and distance education is an activity within the ability of learning at a distance. Though, both definitions are still limited by the differences in time and place (Volery & Lord, 2000). As new technologies become apparent, learning seemed to be the focus of all types of instruction and the term distance learning once again was used to focus on its limitations associated with “distance”, i.e. time and place. The term then used to describe other forms of learning, e.g. online learning, online collaborative learning, web-based learning, electronic Learning or e-learning, technology, mediated learning, virtual learning etc. Thus the common things found in all these definitions is that some form of instruction occurs between two parties (a learner and an instructor), it is held at different times or places, and uses various forms of instructional materials.

3. CONSEQUENCE OF E-LEARNING

During a Computer Based Training (CBT) seminar which was held in Los Angeles in October 1999 in which a strange word was used for the first time in professional environment that was “e-Learning”. Some other words also began to spring up in search of an accurate description such as “Online learning” and “Virtual learning”. There are some conflicting views regarding the definitions of the terms. In particular, Ellis (2004) disagrees with authors like Nichols (2003) who define e-Learning as strictly being accessible using technological tools that are web-distributed, web-based, or web-capable. Ellis believed that electronic learning or e-Learning not only covers content and instructional methods delivered via CD-ROM, Internet or an Intranet but also includes audio and videotape, satellite broadcasting and interactive Tele Vision (TV). Although technological characteristics are included in the definition of the term, Leybold, Nölting, Röser, Tavangarian, and Voigt (2004) as well as Triacca, Bolchini, Botturi, and Inversini (2004) felt that the technology being used was insufficient as a descriptor. Tavangarian et al. (2004) included the constructive theoretical model as a framework for

their definition by stating that eLearning is not only procedural but also shows some transformation of an individual's experience into the individual's knowledge through the knowledge construction process. Both Ellis (2004) and Triacca et al. (2004) believed that there should be some level of interactivity included to make the definition truly applicable in describing the learning experience, even though Triacca et al. (2004) added that eLearning was a type of online learning.

As there is still the main struggle to what technologies should be used so that the term can be referenced, some authors provide either no clear definition or a very vague reference to other terms such as online learning, web-based training, online course, web-based learning, learning objects or distance learning believing that the term can be used synonymously. What is abundantly obvious is that there is some uncertainty as to what exactly are the characteristics of the term, but what is clear is that all forms of e-Learning, whether applications, programs, objects or websites etc. can eventually provide a learning opportunity for individuals.

4. CONSEQUENCE OF ONLINE LEARNING:

Online learning is a method of delivering educational information via the internet instead of in a physical classroom. Online learning can be the most difficult from all of the three learning methodologies to define. Some prefer to distinguish the variance by describing online learning as “wholly” online learning whereas others simply reference the technology medium or context with which it is used. Others display direct relationships between previously described modes and online learning by stating that one uses the technology used in the other. Online learning is described by most authors as access to learning experiences via the use of some technology (Benson, 2002; Carliner, 2004; Conrad, 2002). Both Benson (2002) and Conrad (2002) identify online learning as a more recent version of distance learning which improves access to educational opportunities for learners described as both nontraditional and disenfranchised. Some other authors discuss not only the accessibility of online learning but also its flexibility, connectivity and ability to promote varied interactions (Ally, 2004; Hiltz & Turoff, 2005; Oblinger & Oblinger, 2005). Hiltz and Turoff (2005) in particular not only elude to online learning relationship with distance learning and traditional delivery systems but then Benson (2002) states that online learning is an improved or newer version of distance learning. There are many authors who believe that there is a relation between distance learning or education and online learning but appear unsure in their own descriptive narratives.

5. FEATURES OF ONLINE LEARNING

The main objective of online-learning is to provide access to learning/training where distance and time are two big barriers. In teaching - learning process; teacher-student communication

takes places through online technologies. Our new improving technologies provide so many advantages to the learners over traditional learning. This type of learning system is more flexible. Benefits of online-learning courses are:

- Online-learning let us choose our own time schedule.
- Avoid class distractions.
- Courses are accessible 24×7.
- 24×7 help desk is available.
- Provide different learning styles.
- Provide many ways of delivery.
- When participants are separated by distance from classes. Students pursuing higher education are finding themselves stuck in financial matter. Online-learning is the solution which is available at very low cost. Students can learn anything at anytime by using this advanced technology. Time is the main barrier to employees who need to improve their skills. E-learning breaks these barriers. Like traditional classes, online-learning systems do not require particular timing. Provide suitable time schedule according to the demand of learners. Individuals can access digital library for study materials. Students can access those documents which are unavailable at traditional libraries. Thus it provides another important advantage to learners by proving access to important and rare documents.

6. ONLINE LEARNING COMPONENTS

LMS (Learning Management System)

The LMS is the platform where individuals can view their syllabus, materials including videos, audio files etc. In some system individuals can interact with others via e-mail or interactive chat.

Learners are free to listen, read or watch assignments on their own available time. Some students order their textbooks while others ask for eBooks. Essential resources include podcasts, PowerPoint Presentation, WordPad, webcasts etc.

Students have their own assignments and due dates. They can use discussion forums while facing difficulties in assignments or projects. Students are asked to discuss their projects via blogs. It is necessary to represent their knowledge.

7. FEATURES OF E-LEARNING

- E-Learning is self-paced and provides a chance to the students to speed up or slow down as necessary.
- E-Learning allows students to choose content and tools according to their interests, needs, and skill levels.
- E-Learning provides greater student interaction and collaboration.
- E-Learning improves computer and Internet skills of the students.

- E-Learning accommodates multiple learning styles using a variety of delivery methods.
- By E-Learning geographical barriers are eliminated, opening up broader education options.
- E-Learning makes the accessibility round the clock and allows a greater number of people to attend classes.
- E-learning is the attention of every major university in the world, most of their own online degrees, certificates, and individual courses.
- Traveling time and associated costs (parking, fuel and vehicle maintenance) are reduced or eliminated.
- Cheap method of achieving education. No need of tuition fee, residence charges, food, child care etc.
- Organizations, companies, institutions are using e-learning because its cost is lower than traditional training.

8. E-LEARNING COMPONENTS

- E-learning approaches can include different types of components:
- E-learning study material
- E-mentoring
- Virtual classroom

9. SYNCHRONOUS & ASYNCHRONOUS E-LEARNING

Synchronous e-learning occur in case of real time. Whereas, asynchronous e-learning is time independent. Comparisons between these two approaches are shown below:

<u>Synchronous</u>	<u>Asynchronous</u>
❖ It includes chat	E-mail
❖ Live discussion on websites	Wiki
❖ Share applications	Blogs
❖ Video conference	Forum

10. NECESSARY BUILDING REQUIREMENTS FOR ONLINE LEARNING COURSES

Different types of training courses involve good planning which is more important in this field. Regular Classes involve a huge effort in delivering the content. Whereas e-learning must be structured and it should be able to used multiple times without making ongoing adjustments.

Technology is necessary for designing and delivering e-learning. Different tools are used for producing e-learning materials. MS word is a program in MS office package which can be used as a tool to produce text documents. MS-PowerPoint is another tool which can be used as a presentation tool. To make content interactive, better tools are required e.g. creating 3D animations, 3D images more tools are required. For creating media components some specialized tools are necessary e.g. Adobe Photoshop, Adobe Flash.

There are some requirements for e-learning such as desktop, notebook, kindle, printers. In addition, Internet connection is necessary. Textual e-learning materials do not need high-speed Internet connection. But presentations, live-conversation requires high-speed Internet connection. Offline classes in e-learning do not need Internet connection. They can be delivered through CD's DVD's etc.

11. FEATURES OF DISTANCE LEARNING

Distance education aims to deliver a high quality university education to students who are not able to be physically present on classrooms. Distance education allows freedom to choose when and where one can complete his/her degree. With flexibility of distance education anyone can study on his/her own way and on his/her own time.

"I am too old to study". This is a common sentence in our daily life. Distance learning develops self-motivation and gives an independent approach to lifelong learning. With relaxation of timing, presence at classes, one can study at his/her own pace.

12. WORKING OF DISTANCE EDUCATION SYSTEMS

Students pursuing education through distance learning need to access their study materials. For this reason, the whole system must provide a central digital library. This library may ask a student about his/her ID and password. Students can see webcasts regarding their courses. They can access eBooks, audio files, presentation etc. Some authoritative tools are also necessary. Lectures delivered by teachers must be live on air so it requires high speed internet connection. Teachers giving presentations to their students require some specialized tools. Adobe Photoshop, MS PowerPoint, Movie Maker, Adobe Flash are some examples of these necessary tools.

What about student knowledge? What about their demonstrations? These can be solved by an automated question & answering system, discussion forum etc. Group chat, email are also great way of communicating with others. Students can share their own thoughts on discussion forum which helps other students in their studies.

13. COMPARISONS BETWEEN E-LEARNING, ONLINE-LEARNING AND DISTANCE LEARNING

E - Learning, Online Learning and Distance Learning are the three terms which are interrelated to one another. E-learning is a special term that is used to define learning through electronic medium. This is learning in which the interaction between student and teacher is online. They may or may not be in the same building the learning and the communication is done online. There may be an offline component (e.g, a student might write a response on paper) but there is always an online

connection (e.g. they take a picture of their response to send to the teacher). It focuses on the terms such as anytime, anywhere. Computer power is involved with this type of learning methodology. Nowadays not only computers are involved with this but mobile phones, tablets, PDAs, kindle like devices are also involved. It removes the concepts like "physical presence in the class room", "scheduled time". Among so many advantages there are some limitations as well which are as under:

- Students will need machine of minimum specification.
- Starting cost of e-learning system is very expensive.
- Machine compatibility issues e.g. some users viewing a document compatible for windows systems, but other students are unable to open that file because they are using some other operating systems.
- It highly depends on internet coverage. If some learners unable to use Internet, they can't access services provide by e-learning.

Online-learning is similar to e-learning. It also removes the problem of distance and time which were main barriers of learning. Online-learning is appropriate for remote places. Like traditional learning, open-learning do not rely on the concept of time schedule and physically presence. Someone doing research in a particular field may face some problems due to the presence of online learning he/she can immediately contact with some expert. Another great advantage of online-learning is that up-to-date information is available.

Advance subjects are available all the time. Experts on advance fields are available 24×7. Open-learning also save money, since some online programs cost less than tradition learning programs. The disadvantages as under:

- Although instructors are available 24×7 through email, IM but some learners may face the lack of face-to-face communication.
- There are still many different fields like engineering, aviation – that require practical instructions which are not available online.
- Online systems are expensive to build.
- The whole infrastructure is greatly dependent on IT and IT professionals.
- Electronic devices are mandatory in this case. Hence a learner without electronic device, internet connection is out of this field.

As a breakaway from conventional learning, distance learning defines a new way of teaching in the absence of a direct interaction with teacher and student. One of the big advantages of distance learning is anyone can access the knowledge by means of post or online programs. This contrasts with other learning systems, e-learning and online-learning. Delivery of knowledge can also use electronic media, e.g. CD, DVD, email. Distance learning provides better

accessibility. If someone goes for the online learning method, he/she will only need to have an electronic device and internet connection. Distance learning system has disadvantages too. There is no direct interaction with teacher or instructor. Someone may find themselves in the deep ocean while they are handling their course material.

One should not get distracted to social networking while e-studying or online-studying. We can see that all these learning methodologies are related directly or indirectly with each other. The key points of these learning systems are:

- Eliminating timing problem
- Cover the problem of geographical separation from learning institutions
- Removes the limitation of discussion with experts
- Gives opportunity to study advance topics

There are some common challenges with these methodologies:

- IT infrastructure involved in these fields is expensive.
- Maintenance of service requires a great monitoring on the entire system.
- Providing accurate materials to students is a common challenge
- Learners use different devices, hence compatibility is also a common challenge.
- Lack of face-to-face interaction.

14. ABSTRACT INFRASTRUCTURE MODEL OF:

1. E-LEARNING
2. DISTANCE LEARNING
3. ONLINE-LEARNING

Currently wide range of web-accessible technologies and other services are present which fit into this field. It includes Virtual Private Networks, Local Web-Hosting, Local Area Network, Web-based video delivery etc. VPNs, LANs, Web-Hosting, all technologies use Client-Server architecture. Some of the main requirements when using the Client-Server architecture are:

- Processing speed of Servers.
- Storage space of study materials on Servers.
- High-speed internet connection.
- Specific desktop-applications and web-based applications for end users.

Implementing such infrastructure are too costly to mid-size organizations or small-organizations. So they have to depend on IT companies. Maintaining such infrastructure is also expensive.

15. ARM ARCHITECTURE

Introduction

ARM architecture is 32-bit RISC (Reduced Instruction Set Computer) architecture, developed by British company ARM Holdings. ARM based computer fits into a single 10 cm by 5 cm circuit board.

Some advantages of ARM based computer:

- It consumes significantly less power.
- Reduce cost.
- Generate low heat Replace servers.
- It uses Linux based open source Operating System.
- To provide a better service, industry use well known three tier architecture.

A classical definition of three tier architecture:

A three - tier architecture is a client-server architecture in which the functional process logic, data access, computer data storage and user interface are developed and maintained as independent modules on separate platforms. The structure of this architecture uses three implementations:

- Level 1 which displays related information.
- Level 2 which controls application functionality by manipulating details.
- Level 3 where actual information is stored.

It is proposed to use ARM based systems to reduce the cost of expensive infrastructure of e-learning, online-learning systems.

16. CONCLUSION AND FUTURE SCOPE

E-learning, online-learning, distance-learning has several competitive blessings during a variety of areas like accessibility, flexibility, technology. Nowadays many colleges, universities supply a wide range of online courses, distance courses. Use of online resources for learning is increasing. According to Dr. Wang Liam, "in the future there won't be a difference between online or face-to face education and that they will both be interweaved together to produce the best output."

According to a white paper

The real future lies not just in the technology, but in the potential to integrate several key areas:

- E-learning to develop this capital.
- Knowledge management of intellectual capital.
- Web-enabled electronic performance support systems to use this capital more productively.

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