Chapter-3

E-Learning in LIS Education
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E-LEARNING IN LIS EDUCATION

"The biggest growth in the Internet, and the area that will prove to be one of the biggest agents of change, will be E-Learning. ..."

~John Chambers,
CEO, Cisco Systems (1999)

3. E-Learning: A brief Description

E-Learning, which is short for electronic learning, is defined broadly by web-technology professionals as education and training delivered by an instructor or self-paced from a curriculum database stored on the enterprise local area network (Berry, 2000). It refers to anything delivered, enabled or mediated by electronic technology for the explicit purpose of learning (Hicks, 2000). It offers the possibility of learning from information delivered to us electronically (Honey, 2001). It is a web-based, personal learning experience and provides measurable results (Rich, 2001). The broadest definition refers to any distance-learning mode other than a corresponding course with printed material. The clearest definition of e-learning is that it refers to the use of internet technologies to deliver a broad array of solutions that enhance knowledge and performance. Solutions are networked, which means instant updating, retrieval, distribution and delivery to computer users at standard Internet technology (Rosenberg, 2001a). E-learning applications include self-study, instructor-led web-based training, knowledge management and performance support (Broadbent, 2000). The value of e-learning according to Govindasamy (2002), in the context of e-training, does not lie in its ability to train just anyone, anytime, anywhere but in training the right people to gain the right skills or knowledge at the right time.

Before the dotcom explosion, many analysts predicted e-learning to rapidly become wide-spread and account for the bulk of higher education and corporate training. Analysts predicted e-learning would account for 90% or more of training in 3-4 years. That prediction did not materialize. The timetable
has since pushed out, but analysts think that it will still happen (Piskurich, 2003).

E-learning is frequently discussed in the context of asynchronous, synchronous and blended learning. Asynchronous learning allows the learner to have access to the content material anytime and anywhere, at his convenience. E-learning provides a choice of self-paced study which means that the learner has the choice of when and where to take the lessons (Beamish et al. 2002). The content can be segmented into small modules and the learner can select what modules he wishes to learn. Depending upon the availability of training time, the length of the module can be adjusted accordingly. Most self-paced e-learning allows learners to pre-assess their knowledge so they can focus on areas needing improvement. In contrast, in a classroom environment, the speed of the instructor might be either too fast or too slow for some learners (Hartley, 2001).

Synchronous learning is online virtual classroom learning that allows lectures, discussions, and collaboration to be done via web for users from geographically dispersed areas with no separation of time. The users can participate online with a live instructor and other learners. But unlike the self-paced asynchronous learning that can be accessed at anytime, the real time nature of asynchronous learning with the real time participation of the instructor requires that all learners join at a predefined time. It is closer in format to classroom training, which thrives on real time interaction (Oakes & Rengarajan, 2002).

Blended learning is a combination of the best features of e-learning and classroom learning (Voci & Young, 2001). IBM’s Basic Blue is an example of a blended learning application where a leadership development program trains managers worldwide. It combines extensive e-learning modules with online support, coaching and collaboration.

The choice of method varies on the content and speed required for training. If high level of interactivity is required for training in negotiation skills, e-learning might not deliver the desired level of equivalent interactivity that face-to-face training would provide. Group interactions, culture building, and
teamwork are all critical attributes of an overall learning system that is still frequently best suited for classroom experiences (Rosenberg, 2001b). E-Learning can result in improved performance, greater speed to market, increased operating efficiency, higher retention and greater return on investment (ROI). Benefits can be savings achieved in comparison to existing training programs. Benefits can also come from the ability to perform in a new way previously not available.

![Learning Model by Haitham A. El-Ghareeb](image)

**Figure-1: Learning Model by Haitham A. El-Ghareeb**

Effective e-learning means different for different organizations and each organization has its own way of measuring the effectiveness of e-learning. Effectiveness in performance can mean quality, quantity or a new way of teaching. It means the benefits of e-learning are outweighing the costs of resources required for implementation. E-learning can result in improved performance, greater speed to teach, increased operating efficiency, higher retention and greater return on investment (ROI). Benefits can be savings achieved in comparison to existing training programs. Benefits can also come from the ability to perform in a new way previously not available.

There are four levels of evaluation, which include: (1) the effectiveness perceived by a trainee; (2) as measured by learning evaluation; (3) as observed performance improvement; (4) as teaching impact. Level 1 is a survey of
learner satisfaction. Level 2 is an examination of the content to make sure the learner has mastered the content of the training module. Level 3 is an observation of learners translating their knowledge into workplace performance. Level 4 measures return on investment.

Effectiveness can be undermined in a number of ways: at the learner level if he is unprepared and lacks motivation and time; at the teaching level if the content is not engaging, relevant and useful; and at organizational level if institutional support structure is absent. E-learning strategy should address issues of technology, learning effectiveness, culture, leadership, justification, organization, talent and change (Rosenberg, 2001c).

3.1 E-Learning Definitions

Although there is globally varied connotation of E-learning as some people call it electronic learning, while some prefer to recognize it as online learning, virtual learning, computer-based learning and web-based learning. Nevertheless, due to its broad spectrum of coverage E-learning has been variously defined by number of organizations, commissions and authors. The notable among which are encapsulated here under:

*International Business Machines Corporation* (IBM, 2004) defines E-Learning as “the use of innovative technologies and learning models to transform the way individuals and organizations acquire new skills and access knowledge.”

*Webopedia* (2012) defines E-Learning as “the network-enabled transfer of skills and knowledge. E-learning refers to using electronic applications and processes to learn. E-learning applications and processes include Web-based learning, computer-based learning, virtual classrooms and digital collaboration.”

*Ruth Clark* (2002) defines E-Learning as “content and instructional methods delivered on a computer (whether on CD-ROM, the Internet or an intranet), and designed to build knowledge and skills related to individual or organizational goals.”

*Elliott Masie* (2003) describes E-Learning as “the use of network technology to design, deliver, select, administer, and extend learning.”
Commission of the European Communities (2001) defines E-Learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration.”

1st National Conference on E-Learning (2002) defines “Electronic learning or E-learning as a generic term for all electronically supported learning which includes an array of teaching and learning tools that use electronic media including phone bridging audio and videotape, video teleconferencing, and satellite broadcast. In recent years, the term has been delimited to Web-based or online courses that make use of electronic mail; video conferencing, discussion boards, chat rooms, and electronic whiteboards on the Internet.”

MacMillan Dictionary Thesaurus (2012) defines “E-Learning as the methods of learning that involves the use of computers and the Internet.”

E-learning Glossary (2012) defines E-learning as “a method that utilizes available technologies to facilitate learning. This method of learning utilizes networks to deliver learning content, enable interaction between users, and generally facilitate the learning process from both teacher and student perspectives. E-learning employs written, audio and visual content to deliver learning content that can be accessed with a computer anytime anywhere.”

E-learning Forum Romania (2004) defines “E-learning as a planed teaching and learning experience organized by an higher education institution, which supports learning process through internet in a sequential and systematized order to be achieved by students in their own pace.

3.2 Why E-Learning?

In the fierce global competition, compression of time, expansive territory, and demand for just-in-time learning, the streamlined workforce, fiscal concerns and the rapid movement towards a digital society, e-learning can be an essential component of a higher learning to achieve strategic goals and competitive advantage. The increasing demands for continuous, flexible lifelong education and the availability of increased bandwidth of more power
communication technologies are stimuli for extensive developments in e-learning (Clarke & Hermens, 2001).

The web is one of the most important and prevalent current technologies. Its use as a means and method of delivering material for learning is likely to have a greater influence on learning than all the developments in instructional technology of the past 30 years (Alessi & Trollip, 2001). Since the web is not only used to enhance teaching and learning in the traditional face-to-face environment, but also supports distance learning and teaching by enabling learners to communicate both synchronously and asynchronously. Such means of teaching and learning have captured the interests of educators worldwide. Educators from all levels of teaching are rethinking the very nature of teaching, learning and educating due to the existence of web-based learning environments (Owston, 1998).

According to a UNESCO report there are several global forces that are serving to raise the sense of urgency: i) World population in 2015 will be 7.2 billion, up from the current 6.1 billion. Ninety-five percent of the increase will be in developing countries. People in most countries will live longer, which will add to the demand for access to education and other services. ii) Globalisation, the unrestricted flow of information, ideas, cultural values, capital, goods and services, and people, will enhance not only the demand for education, but create need for more diversified content and greater flexibility of access (CIA, 2000; UNESCO, 1998).

However, two trends running parallel to the globalisation process will have a significant impact on the development of global systems of virtual education. These are the creation of more small and medium-sized enterprises and an increasing desire to defend cultural, linguistic and religious identities. Each of these trends complicates inter-institutional collaboration and mitigates against the flow of globalised content across borders.

Cunningham et al. (2000), in the comprehensive analysis *The Business of Borderless Education*, identified the following forces as driving the growth of what they called the “alternative education market” in those jurisdictions:
(a) The globalised economy, with a growing demand for standardised products, services and technical infrastructure, and sophisticated communication systems.

(b) The emergence of a post-industrial information age and the explosive growth and distributed nature of new knowledge.

(c) The demands for greater access to tertiary education fuelled by rapid changes in the economy, the need to maintain and upgrade skills for employment, and industry’s demand for “work-ready” graduates.

(d) The growing reluctance on the part of governments to fund the increasing demand for higher education.

The educational strategies that are being deployed in response to these forces are described with various names, that is, “Virtual education,” “distance education,” “distributed learning,” “online learning,” “Web-based learning,” “e-education,” “e-learning,” or any one of a number of other labels. Current strategies typically involve the use of digital networks, either synchronously or asynchronously, for the delivery of courses, the management of administrative services as well as the provision of learner support services. This phenomenon is further buttressed by a recent report issued by the American Council on Education (ACE). It states: “The new e-education force transforming higher education may not be controlled by the traditional structures or providers of education or by traditional academic policies. Not only do the new forms of education portend a change for student populations, but also they will force faculty to develop new modalities of teaching and administrators to provide a new infrastructure for support”.

Consequently, the advent of e-learning is forcing many institutions to review and amend many of their existing policies and procedures. This is because currently there is a strong move naturally towards integrating computer assisted learning technologies (CAL) into the education curriculum (Dearing et. al., 1997); much of which has been motivated by the view that e-learning offer many educational advantages over traditional teaching. Thus, due to the growing and diversifying demand for higher education, increased competition
and globalisation, there is the need for higher educational institutions to outline clear and comprehensive strategies for ICT in relation to the types of technologies to use as well as make appropriate choices about the markets they can and wish to serve.

However, the actual influence of these external conditions is determined by the way in which the internal actors perceive the changes in their environment and their ideas about future trends. But the current situation points to a gap between vision and reality or that the "Virtual University" works in theory but not in practice. Many higher educational institutions are still struggling to overcome the "pioneer" phase, while trying to move into a phase of more mainstream engagement. In order to be successful, indeed, the commitment of some dedicated individuals will not suffice; the institution itself must make a commitment (i.e. for support, resources and personnel) as well as develop a targeted implementation strategy. Therefore, there is the need for internal and external factors such as faculty or staff members, students and policy makers to know more about the implications of technology use. For instance when one examines faculty use of e-learning though the availability of IT is becoming common, little is known about the actual extent of higher educational instructors' access to and use of the Internet and other telecommunications technologies.

Recent surveys of academic-computing officials at over 500 post secondary institutions in the United States have shown that more than 40 percent of senior IT officials believe that their top priorities, and biggest challenges, are getting faculty to work with technology and helping them to integrate technology with instruction (Green, 2001). As the typical college has doubled it's spending on information technology services over the past 10 years, it becomes increasingly important to know whether or not postsecondary faculty are using electronic mail, the Internet, and Web sites for instructional purposes. For example, a recent forum on technology use in higher education found that, due to a pervasive scepticism among faculty and administrators about the quality and effectiveness of online research and teaching, established professors were more
inclined than their untenured counterparts to use information technology in teaching (Kiernan, 2000).

Thus, summarising this phase of my discussion, one could realize that there is a great need for effective e-learning in order to promote self-regulated learning through appropriate methods and to provide greater flexibility and timeliness which can suit educational needs at any time especially where traditional classroom-based learning is disruptive.

3.3 Key drivers of E-learning

3.3.1 Economic Drivers

(a) Profitability: Spurred on by goals of cost-effectiveness and competitiveness, today’s organizations and institutions look at e-learning as a means of reducing costs associated with traditional training especially travel and lodging expenses. Based on results from a survey on e-learning, W.R. Hambrecht (2000a) suggests that two thirds of training budgets are allocated to travelling costs alone. Both lack productivity caused by students being away from their place of work and travelling costs represents areas for improvement of the efficiency of training.

(b) Globalization: The widening of the free education movement is stimulating the international expansion of institutions leading to larger, more complex organizations employing vastly distributed workforce across the globe. Attempting to deliver training to their geographically remote and culturally diverse workforce, organizations are using e-learning to deploy time and cost efficient as well as adaptive training solutions. A survey conducted under the aegis of Corporate University Xchange in 1999, estimated that the proportion of instructor-led training will decline from 80% to 60% by 2003, while e-learning will double from 20% to 40% in the same timeframe (Hambrecht, 2000b).

3.3.2 Technological Drivers

(a) Ubiquity of ICTs: The burgeoning growth of e-learning is not only related to economic factors but to access too. According to the conference board, Canada is ranked second in the world behind the U.S. for its “connectedness”
(Murray, 2001a), that is the number of homes and enterprises connected to the internet. By 2003, International Data Corporation (IDC) predicted that the number of internet users worldwide will expand to approximately 502 million, up from 87 million in 1997, which has risen to 1,971 million in 2010, representing a compound annual growth rate (CAGR) of 34%. The increasing availability of ICTs in the workplace and at home together with better technology infrastructure, especially for bandwidth, fuels the adoption of e-learning as a vector for training and education.

\[ \text{Internet users per 100 inhabitants 1997-2007 (Source: ITU)} \]

![Image of Internet Users Worldwide](image)

Figure-2: Internet Users World Wide

(b) IT skills and knowledge shortage: As organizations shift to more sophisticated technology like enterprise resource planning (ERP) systems ranging from administration, financing, manufacturing, R&D to marketing, products and services are churned out at an accelerated pace, and the skills and knowledge required to generate them need to be constantly updated. An estimated 30% of Canadian employers say their employees do not have currently needed skills of which many are associated with ICTs (Murray, 2001b). Higher penetration of ICTs in the workplace exposes a chasm between high demands in computer literacy, also known as e-literacy, and huge knowledge gaps in the workforce, a situation that organizations are attempting to address with increased training and the creation of corporate universities. Statistics Canada's 1999 workplace and employee survey reveals that
acquisition of computer technology is related to higher levels of computer-related training. The results indicate that 51% of workplaces that implemented computer technology also provided formal or informal computer-related training. As a result of the growing adoption of technology and the collateral emphasis on training, educational representatives are investing more and more in e-learning as a fast strategy.

3.3.3 Social Drivers

(a) Human capital development: A paradigm shift is at work as we move into the information age. In the industrial era, organizations’ primary form of capital was physical and financial assets, but today’s corporate values are increasingly defined through human, intellectual capital (Marsick & Watkins, 1999). More organizations are now aspiring to become “learning organizations” (Senge, 1994) where employees are given more power to make decisions and kept on the cutting edge of education and training in order to better contribute to organizational goals. Empowerment and up-to-date knowledge are becoming key factors in the quest for sustained growth of performance because individuals’ commitment and creativity increases when they are closely involved in the decision making process and knowledgeable enough to make substantive assessments (Draft, 2000). As a result of this trend, organizations are implementing various training programs (e-learning and classroom-based) not only to prompt migrations towards an institutionalized participative culture, but also to support continuous development of learning.

(b) Lifelong learning: In parallel with the change of organizational paradigm, demographic evolutions steer the need for new approaches to learning. The U.S. department of education’s statistics on attendance to higher education institutions suggests that students aged 18 to 20 accounts for less than 20% compared with students at 25 years old and more who have become the fastest growing group (U.S. Department of Education, 1997). These older, working, part-time students, who are seeking education primarily to further their career and augment their salaries, have to juggle with time and location constraints and demand flexible access to learning. This situation is echoed in many
countries including Canada, the United Kingdom and economic bodies such as the European Union who have recognized along with the Organization for Economic Co-operation and Development (OECD), "the urgent need to implement effective strategies for lifelong learning for all, to strengthen the capacity of individuals to adapt and acquire new skills and competences" (OECD, 1998). E-learning with its potential for course delivery at home and in the workplace is poised to accommodate a growing number of lifelong learners and thereby help shape a better-skilled workforce.

3.4 Pre-requisites and Application Scenarios for E-learning

By means of e-Learning, it seems that we have a new approach which meets all demands and provides a proficient way of learning by incorporating learning theories and combining them with new technological advances. Various analysts confirm this by predicting remarkable growth for e-Learning.

According to META Group (2002), within the next two years, 60 percent of organizations will deploy e-learning systems. Whether the training is for the marketing department, new employees, customers, consultants, partners, or IT workers, e-learning tools and practices have emerged as the medium for efficient transfer and management of knowledge across the extended enterprise.

One of the key prerequisites for e-Learning (Sun Trust, 2002) is the growth and adoption of the Internet as its transport medium. International Data Corporation (IDC) forecasted in its report 1998 that there will be 320 million Internet users worldwide by the end of 2002. In the interim, this has been exceeded by far. According to Internet world stats (2010), more than 2,050 million users are online worldwide as of December 2010; more than 700 million hosts are available (Internet Systems Consortium). Several factors facilitate this significant growth:

- A large and growing support of installed computers in the home and workplace.
- Network protection, infrastructure, and bandwidth improvements.
- Advancement in the speed of personal computers and modem & xDSL performance.
- Cheap and more reliable access to the Internet.
- Consumer acceptance of online business.

![Internet Domain Survey Host Count](image)

*Figure 3: Internet domain survey host count (Jan. 2010)*

Another prerequisite for a successful implementation of e-learning is the change of the learner's mind because the way of learning is so much different compared to traditional learning (e.g. learner-centered vs. teacher-centered) and offer other possibilities to add in the overall working or living process. In addition to that, there is no ideal way of using e-learning efficiently, because there are different application scenarios which require different approaches. Perhaps, e-Learning alone is not the best way, because it might be sensible to combine it with conventional instructor-led training, so called "blended learning" (the combination of different learning concepts and techniques). But, at the bottom line, I want to stress that e-Learning can help to improve the effectiveness of learning tremendously if done properly.

Main application scenarios where e-learning can be used are (Alsultanny, 2006):

- Primary, secondary and post-secondary education which include schools, high schools, colleges & universities.
- Virtual universities which provide access to (high quality) education otherwise not possible for some students due to time or spatial constraints or because it is too expensive.
• Bringing together students from different countries to better understand other cultures and prepare for the globalized world and ensure peace between nations. Distinctive subjects which are well suitable are e.g. languages, geography, history, biology and religion or cross country projects in any subject.

• The chance to better support students with different needs e.g. by providing more individual regulation, support and possibilities for practicing, or by offering a broader spectrum of information for highly concerned individuals.

• With the new communication and collaboration functionalities of e-Learning, change the drill and practice detailed learning to more independent but guided knowledge acquisition.

However, the amount of e-Learning in the sense of electronic learning that seems to be useful differs much between primary and post-secondary education, because primary education also has the additional goal of socializing children which cannot be done yet by e-learning in a sensible way. Therefore, in this case, it is more a supplementary way of learning and teaching and not a replacement.

• Working life (corporate training sector): Here, e-Learning has its chief advantage in its elimination of the boundary between learning and working. However, it does not signify that learning can be done completely on the side, because learning is an intellectual process that still needs its time and environment. It means that learning can be better incorporated in the working process (Roblyer, 2003). Examples for this are:
  - Just in time knowledge: Learn what and when you need it. This requires that the learning system is accessible at any time with ease to use to focus on the knowledge and problem solution and not on the system.
Assured rapid knowledge transfer: Inform employees about things they do not even know exist in a supervised way so that it is verifiable that the information has been consumed and understood.

Quick distribution of information about new products and strategies which have a short life span to a large number of employees. Conventional learning strategies are not able to perform a "rollout" to several hundred or thousand employees within short time.

Human Capital Management (HCM): This is a more focused and strategic training of employees depending on their future employment and career path. The training can be perceived with blended learning (integrating different learning strategies, e.g. ILT and e-Learning), but coordinated and controlled by skill gap analysis and skill management (as part of an overall e-Learning architecture).

Virtual corporate universities: Especially in large enterprises with many employees it makes sense to have one centralized training department, the so called corporate university. However, quite often large universities have many branches which are distributed over several countries or even continents. In this matter, it is more efficient to make large parts of the training virtual to cut down travelling costs and absence of the workplace and offer distant education within a virtual university.

Life-long learning: Short production cycles, the short half-life period of knowledge and new ideas continue to revolutionize our day-to-day life. As an employee or as an individual, "What you know" equates to "What You Are Worth". Workers buy Skills and Know How. Keeping up in times of rapid change increases the individual's worth and is the pre-requisite for career advancements. Even in our daily life, new tools and concepts have an impact and require ongoing learning. E-Learning could be an excellent and cost efficient solution which allows learning at home.
3.5 Critical Analysis of advantages and disadvantages of E-Learning

Several benefits and limitations are usually associated with e-Learning. Below are listed some of the examined advantages along with their potential risks and checked under which pre-requisites they can be true and take a look at disadvantages and show possible solutions for them.

Advantages

(a) Independence of learning place

Advantage:
Individuals at different places can effectively communicate with co-students or instructors without being in the same room. Students can learn at home in a relaxed atmosphere or at their working places.

The biggest advantage here is cost and time saving, because neither travel and accommodation expenses arise, nor do costs arise for missed functioning time due to travelling.

Potential risks:

The most important requirement for e-Learning is access to the system over the Internet or Intranet where the learning environment runs. However, not always are the bandwidth and thus the connection speed sufficient for the e-Learning content, especially if it is multi-medial. In addition to that, excellent Internet access can become quite cost intensive. However, flat rate xDSL (digital subscriber line) or cable-modern connections begin to widespread especially in cities and will soon become a standard in a high percentage of households. In the meantime, a combination of offline and online learning, where the user need not be online all the time but just to synchronize with the server could be a solution for that problem.

But that is just the beginning. True spatial independence will emerge when handheld devices or lightweight laptops in combination with wireless connections (over e.g. ISO802.11b (IEEE 802.11b) or UMTS are fully developed and gain acceptance.

Independently of all technical aspects, we also have to take a look at social impacts of learning at external training institutions: meeting other learners at
different places often in different cities far away from daily dealings can also be of special value and often understood as an additional incentive, maybe also because learners know that this is rather expensive. In addition to that, it might be rather sensible to not hold an e-learning course as a completely online course but also schedule real face to face meetings. (Blended learning)

- at the beginning of the course, to introduce all learners and the teachers to each other,
- maybe during the training to implement communication and collaboration, provide synchronization points and inspire the learners and
- at the completion of the course to discuss how to advance after the course, because with e-learning, learning is not necessarily over with the end of the course but could be re-done or extended.

(b) Free choice of learning time and speed and Just-In-Time learning

Advantage:
Learners can decide when the best time for learning is, e.g. during breaks or when the learner is comfortable and can adjust the speed of learning according to their needs like their powers of comprehension or whether they are in a healthy state.

Just-in-time learning allows individuals to learn on an as-needed basis. Learners or students can access information quickly at the time the knowledge is needed rather than obtaining information that may never be used or may be used in the long-term.

Potential risks:
Two important parts of e-Learning are collaboration and communication. Especially synchronous communication like chat or video conferencing is highly time dependent and only works when all communication associates are online at the same time and thus requires good time management. Even asynchronous communication and collaboration are not completely free of time constraints because it does not make sense to answer questions or work together on a project if the time delays after each response are weeks or months. Even days can become a trouble when close collaboration is required.
However, from a pedagogical point of view, taking an e-Learning course cannot be done during working breaks. Given milestones that have to be reached, virtual meetings or virtual office hours with a fixed place within the learner’s time schedule can assist to put a convinced pressure on the student to advance with the self-learning or fulfil the given tasks and exercises.

(c) Fast distribution and dissemination of new information to many people

Advantage:
E-Learning increases the pace at which knowledge is acquired, which is especially important in the research and development process and can be used to distribute information about e.g.

- New developments and strategies that have a short life cycle to train researchers and scientists or consultants or
- Technical changes which have to be implemented by a large number of employees as quickly as possible

Potential risks:
The establishment of the e-learning environment and especially the production of content material are not rapid and efficient enough. Reuse of content units, metadata and standardized interface can help here. Quite often less classy content can be enhanced by a good learning strategy and good support by the instructor or tutor.

E-learning is not only a technology that has to be introduced but a whole concept which also require changes in the organization to work effectively and efficiently, especially in combination with secure information delivery and just-in-time learning, there is no clear dividing line between intranet/knowledge management systems and an e-learning environment. To make it work successfully, an overall model needs to be made and pushed through.

(d) Adaptive learning

Advantage:
With e-learning, the learning content and theory can be adapted to each individual’s strengths and weaknesses to make the learning experience most efficient. Depending on the awareness and knowledge background of the
learner, which has been determined by pre-tests, the ideal learning style and type and the progress made so far (verified by post-tests and the speed of learning) the environment decides what and in which way content should be offered next. Possible potential parameters are different learning paths through the content, different ways of presentation of the same content (e.g. through audio) or offering a diverse set of functions which the user interface of the learning system provides to reduce complexity.

Potential risks:

Unfortunately, Intelligent Tutoring Systems (ITS), which are by concept the most advanced form of adaptive systems, are quite complex and not fully developed yet. Most e-learning systems only provide restricted feature set (like pre/post-tests and simple learning paths) and the creation of contents which support these techniques is rather expensive and time consuming. Here, excellent authoring tools and reuse of content could help a lot.

Quite often the learning subject matter which does not only consist of the content is not well organized and does not support different learning concepts and techniques or the learner does not know how to deal with or use them because the user interface and management of the system, the instructor and the content is not good enough (Moore, 1993). The only solution to this problem is that course authors, instructors and developers of e-learning environments are aware of pedagogical principles and act accordingly to get the most out of the technical possibilities.

(e) Multimedia and interactive learning motivates and ensures learning success

Advantage:

Numerous research efforts on the effect of media on education have shown that different media types have different efficiencies in terms of what a learner can recall.

In general from 100 % of the learning material (facts/ideas) we can remember:

• 10 % through reading,
• 20 % through hearing,
- 30% through seeing,
- 40% through hearing and seeing,
- 80% through hearing, seeing and doing (interacting)

In addition to that, well organized content is fun learning and thus motivates the learner which increases learning accomplishment.

Potential risks:
Unfortunately, the creation of high-quality content, especially when it contains multimedia (animations and simulations), audio and video parts is very costly and requires good knowledge in different knowledge areas. In addition to that, available bandwidth and connection speed still restricts the use of large volume of data such as videos.

A way around these problems are better authoring tools which mechanize large parts of the authoring process (including technical and pedagogical issues), reuse of content and the use of other learning units that do not only focus on fully prepared content, but make collaboration, communication, self-controlled knowledge gathering and content production a key element.

Other possibilities to work around the technical limitations of limited bandwidth is using the already previously mentioned hybrid technology which combines online and offline learning, where large volumes of data (such as videos) are accessible locally.

(f) Supervision of learning process and tracking of learner’s performance
Advantage:
Server based e-learning environments offer the possibility to log any transaction to the server and thus provide a detailed report how the users perform within the environment. This information can be used to get a general idea what progress the learners make and act accordingly by motivating them or offering help in case of difficulties and technical hitches. It can also be used to find out who is good at doing certain things at an early phase and support the learner by offering a special career path.
In addition to that, the system can be also used to manage proficiency profiles of all tracked learners at a higher level to find out who is an expert for a special knowledge area or what information is missing to make him an expert.

Potential risks:

The above described advantages are mainly on the instructor's side; the learner might perceive such things a little bit different because this kind of controlling can also be understood as a contravention of privacy. Depending on the country, different laws which protect people's personal sphere could exist. In addition to consider local laws and learners' objections, special care has to be taken that this kind of information must not be misused.

Disadvantages

(a) No personal contact to teacher/coach and to other learners

Disadvantage:

Virtual communication such as audio and video conferencing is very costly and is not always possible and also not a full replacement of face to face contact. There is a lack of personal contact which de-motivates learners and increases the drop out rate.

Remedy:

To keep online learners motivated, several measures can help:

- Community building: By creating a team of learners working for the identical goals and supporting each other, an internal pressure for development and success is put on all members.
- Attainable goals and milestones help the learners to check whether they are on track or need to speed up.
- Clear and lucid guidelines and a good user interface prevent users in getting lost within the system and give up. User needs to feel at home within the environment.
- In case of very difficult topics: Cover the primary learning goal into a different more appealing story which is easier to understand and makes more fun. This uses the supplementary learning effect (Holzinger & Maurer, 1999).
• Blend online learning with real face to face interactions to introduce all
members and synchronize their learning progress.

(b) Incentive of external training does not exist anymore

Disadvantage:

External trainings, especially longer training periods are often seen as an
incentive because they are very expensive, travelling to other places and cities
and coming in contact with other people and cultures, social events are fun.

Remedy:

Make it clear that participating in trainings is the real incentive and a special
chance at the same time. Provide other incentives directly associated to success
of training to ensure that it has an immediate effect e.g. opting and finishing
several trainings lead to a healthier position or a progression on own career
path.

(c) Difficulty in learning from a computer display:

Disadvantage:

Compared to books, reading from monitor or screen is more strain on the eyes.

Remedy:

One of the possibilities is to use other media than the screen, e.g. audio that
explain certain aspects, or incorporate tasks which do not require the computer
display to look at, not everything require a PC to be done or practiced.

For the future, there is a hope that display technology will improve
significantly. High-quality TFT displays are already available and will continue
to increase in optimum brightness and contrast, new technologies like
electronic ink (E-Ink) (Jacobson, 1997) are currently under development.

(d) Only few online-learners finish a course

Disadvantage:

According to Forrester research, 70% of learners starting with an online course
will never finish it. Carr (2000) noted that dropout rates are often 10 to 20
percent higher in distance education courses than in traditional courses. Is
online education really efficient enough?
Remedy:
For some dropouts, there are a number of well-documented reasons, including the fact that adults sometimes only register for a course in order to obtain knowledge or a degree, not credit, and may therefore drop the course once they obtain it. Motivating learners to keep them working with the learning environment and topic is the key to successful learning. To achieve this division, use of different pedagogical concepts is required. One key concern here is the support of learning communities.
According to Rovai (2002a), seven factors which positively correlate to sense of community and influence course design and pedagogy are:

- **Transactional distance**: This is the psychological and communication space between learners and instructors and is a function of structure and dialogue. Structure is the amount of control exercised by the instructor in a learning environment and tends to increase psychological distance. Dialogue is the amount of control exercised by the learner and tends to decrease psychological distance and increase sense of community.

- **Social presence**: This means that tutors need to be present within the virtual community; creating content and establishing the community without fostering it is not enough.

- **Social equality**: One of the difficult tasks of a tutor is to play the role of a moderator to insure equal opportunities for participation by all students. A threat to community occurs when one or more students use an authoritative tone in online discussions, followed by those students who have a more inclusive style of discourse, who feel put off and thus reduce discussion participation.

- **Small group activities**: Breaking large numbers of students into small groups (typically under ten learners each), providing specific tasks, and setting timelines support the concepts of situated learning and communities of practice and help students make connections with each other.
• Group facilitation: To support the group's way of working, to strengthen, regulate and perpetuate the group as a group the following skills are useful for the tutor to have as the group's facilitator: encourager, harmonizer, compromiser, gatekeeper, standard setter, observer, and follower.

• Teaching style and learning stage: Good teaching does two things:
  (a) it matches the student's stage of self-direction, and
  (b) it empowers the student to progress toward greater self-direction.

Good teaching is situational and requires that the online instructor design and facilitate an online course that accommodates the needs of all learners, regardless of their stage of learning.

• Community size: The right community size is the last important factor to correlate to the sense of community. Too few members generate little interactions and too many members generate a sense of being overwhelmed. As a general guideline eight to ten students are the critical mass necessary for a community where 20-30 students are the maximum that a single online tutor usually can handle. However, larger online courses can be managed by using a team teaching approach in order to maintain a reasonable student-instructor ratio and by using multiple active discussion groups so that each learner can make connections with a reasonable number of community members. Alternatively, large courses that focus on delivering content can be created, followed by small discussion groups led by subject matter experts providing one-on-few coaching and mentoring (Rovai, 2002b).

(e) Time consuming, complex and expensive installation of learning systems

Disadvantage:

Here we have to distinguish between the installation of the system and its usage. The installation is indeed a complex task which must not be reduced to the technical parts like setting up the system and its technical infrastructure but also have to include the organizational concept which is required to make e-learning a success. Unfortunately, the usage of the system for the different
types of users is quite often too unclear and confusing and leads to improper and inefficient utilization.

Remedy:
Designers and developers of e-Learning environments have to place more stress on usability, consistency and modularity, keep it simple and intuitive ("less is more"). Users should enjoy using the system, which also includes that such systems have no or very few bugs. The advantages of the system must be clearly visible for all involved roles (learner, trainer, author, administrator and the decision makers who pay for all of this). Immediate Return of Investment is probably more important here than elsewhere to be successful.

(f) The creation of e-learning courses is too expensive

Disadvantage:
The production of high quality e-Learning courses is very expensive.

Remedy:
First this is not completely true because that depends on how the course is used and which costs are compared. If an expensive course is used by hundreds or thousands of employees that otherwise would have been trained by traditional instructor led training seminars and if all additional costs such as travel and accommodation costs and absence times are included in the comparison then the creation of an expensive course and giving the online seminar might be still the cheaper solution.

In addition to that authoring costs can be reduced by good authoring tools and reuse of already produced material. Another possibility to cut down costs for creating course content material is to reduce the amount of material used and substitute it by other learning concepts such as online collaboration.

3.6 International Perspective of E-Learning

The universe of post secondary education is ever expanding and demanding. The present age is an era of rapid demographic and labour market changes, increased competition, shifts in institutional form (e.g., non-profit/for-profit partnerships, corporate universities) and new forms of delivery driven by emerging technologies. Online education is constantly challenging the
traditional importance of institutional locale and political boundaries. It has run into the considerable complexities and policy collision of state and national regulation and multiple levels of accreditation in European countries. On the international level, significant attention is being paid by UNESCO, OECD, and others to the role of e-learning in cross-border education and its implications for national quality assurance and accreditation.

In February 2006, the Center for Studies in Higher Education (CSHE) at the University of California (UC), Berkeley, with the support of the Ford Foundation and the Andrew W. Mellon Foundation, convened 21 experts at WCET in Boulder, Colorado, to explore and inform current and ongoing debates in the regulation of technology-mediated higher education both domestically and globally (Dow, Lohnes & Albertson, 2005).

In the United States, there were more than 500,000 enrollments in online courses in grades K-12 and more than one-third of public school districts offered some type of eLearning during the 2005-2006 school years. The North American Council for Online Learning (NACOL) surveyed over 30 countries in order to highlight international trends in online learning, identify online learning initiatives and projects in individual countries, and to promote international dialogue for future collaboration.

New South Wales Australia provides online learning to K-12 students through the Country Areas Program (CAP). The program services 248 public and private schools as a component of the Commonwealth’s Programmes. CAP’s focus is to improve the education of students living in remote and isolated communities. Seven consultants assist schools across the state in implementing programs, activities and workshops on online learning.

Education in Canada is a provincial government responsibility. The Ministry of Education (provincial) and Districts (local) at each level monitor and implement e-Learning programs. All provinces have made progress with regards to online learning, but a national plan has not been developed. There have been discussions around the collaboration of consortia across borders.
Due to high costs and the current state of the Internet, e-Learning in China is still new and only used as a supplement to the current face-to-face content. The number of online learners is growing, but the increasing number of e-Learners still accounts for a very small percentage of China's population. Specialists have forecasted that the excitement of online education will push the current, non-ideal Internet in China to make profits through e-Learning.

E-Learning in Hong Kong enables students to engage in collaboration, inquiry and projects at anytime, from anywhere. It was stipulated in the new IT in Education Strategy Policy Document “Empowering Learning and Teaching with Information Technology” published by the Education and Manpower Bureau (EMB) in July 2004, that suitably designed e-Learning platforms to support the above-mentioned learning activities, which will be provided for all primary and secondary schools. All public sector schools in Hong Kong are funded by the Government. Currently, there are no schools which provide entire online courses for students to complete all of their studies from home. Instead, local teachers create additional learning activities for students to work on online after school or at home as a means to strengthen the classroom teaching which occurs during regular school hours.

Online education in Iran is delivered by both the private sector and government organizations. Students from the urban areas and large schools are participating in online courses. E-Learning in Iran is based entirely on a blended model of learning. Courses are developed by the government and are free of charge for the student. The government has been working to create education standards, but they have not yet been published. There are currently no entirely online courses in the country. Several teachers in Iran are also collaborating with other teachers from all over the world in online projects sponsored by iEARN and ENO. At the university level, Iran is working with Italy, Germany, and the United Kingdom to develop online courses.

Singapore schools have the autonomy to decide how they want to implement the use of IT for teaching and learning, which includes online education. At this point in time, about 75% of the schools have subscribed to learning
management systems (LMS), and the percentage is rising as the remaining schools plan to come on board. A few have also developed their own system using the open source software, Moodle. The country’s goal is to have all secondary schools (grades 7-10) and junior colleges (grades 11-12) using an LMS by the end 2006. “iSHARE” (Inter-Cluster Sharing of Resources) is a content management framework which allows schools working within a cluster to share digital content with one another. This intranet framework facilitates the sharing of digital teaching and learning resources among schools in order to support online learning in the schools.

E-Learning began in Turkey in 1995 by the Turkish Education Foundation, which was created by prominent businessmen and women in the country. The local governments started with 40 rooms, Learning Stations, in the most remote areas of Turkey, where teachers cannot be sent because of terrorism. A few years later, these rooms were set up with computers, compact discs, and the Internet. Today, there are over 100 stations set up, which service over 600,000 children and adults.

E-Learning in the United Kingdom is relatively widespread in the university sector but is much less common in the K-12 school sector. The government, institutions, and faculty members are working together to develop content in the universities. In May 2005, the Department for Education and Skills created the e-strategy: ‘Harnessing Technology: Transforming Learning and Children’s Services’ to provide a master plan for the future of e-Learning in the U.K. Their goal is to build a common ground by bringing the education and children’s services groups to a level of using technology effectively within the next five years. Within ten years, they want to build on the capabilities of their newly skilled workforce in order to become more ambitious and innovative.

Models for funding e-Learning, the process for content creation, and professional development for teachers have been successfully implemented in those countries who have implemented online lessons and courses. However, the need for standards and measuring quality in online content is lacking in most countries. Australia, Canada, and Singapore have taken the lead in the
development of these standards and measures of quality for their individual countries, and New Zealand is currently working with the IMS Global Learning Consortium to adopt international standards that can be used by countries around the world. SCORM standards have been implemented internationally; however, not all e-Learning programs are in compliance. This summary provides several exciting and promising approaches and trends for the future of e-learning.

3.7 E-Learning in India

E-learning, though reached India late of course, but it is being fast accepted in a big way. India perhaps has watched the success of west in adopting e-learning and is trying hard to implement it. Over the past few years, the Ministry of Human Resource Development has been trying to achieve the target of making education accessible to every corner of the country. Still there are many parts of the country, which are in darkness about e-learning (Malik, 2009). Due to the growing Indian economy, India has a chance to become heart of e-learning programs. There are many e-learning classes which are coming to India to build and develop e-learning infrastructure. E-learning does not seem to replace the conventional classrooms with black boards but it seems to coexist with the already existing system. This system rather promises to reach far off rural areas in India where education is still a looming darkness. This objective can be achieved by providing PCs at low cost with broadband connection. The chances of e-learning to strengthen the educational system in India are very high. Furthermore the Government has also come forward undertaking the programs of upgrading the technical quality of the fresh graduates inciting them to go into research and teaching professions.

E-learning is fast growing and seems to take control of the world because of its advantages (Saha, 2010). The scope of e-learning is much wider in India with many e-learning companies stepping forward in providing the service. Though nothing can actually outrun the popularity of traditional classroom teaching, e-learning only gives more value to the process, independent of the distance factor. In India, e-learning scenario is still growing and at an experimental
stage. Traditional mindsets are changing, with the corporate and business sector leading the way in embracing technology-based learning avenues. Many institutions have started augmenting teacher-led programmes with content-rich e-learning modules. Government initiatives are not far behind either. The projection for further development of distance e-Learning in India is positive. Several efforts are currently progressing towards providing quality distance learning to more people in urban and rural areas, through the utilization of more effective web resources and practices. The major hindrance to the acceptance of e-learning can be attributed to the Indian mindset that is more inclined to traditional classroom teaching (Hansen, 2008). With PC penetration and overall online accessibility increasing in the country, the future of e-learning looks promising provided the organization of content and delivery is well-structured.

3.8 E-learning initiatives in India
Some of the Indian initiatives taken by the Indian institutions towards e-learning are given below:

**NME-ICT:**
In February 2009, India launched a National Mission on Education through ICT, which is a Billion Dollar enterprise. It will provide internet connection to about 20 thousand colleges and other educational institutions. UNESCO is 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).

**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.

NODLINET:
The Library and Documentation Division of IGNOU has started making efforts to take higher education to the doorsteps of the hitherto un-reached through its diverse modes of Information and Document Delivery Services. NODLINET (National Open and Distance Learners’ Library and Information Network) is one such recent initiative taken up by IGNOU to provide a podium for libraries and information centres of the open and distance learning system of the country that will provide access to all electronic and digital resources from the leading publishers and vendors across the globe to its stockholders from anywhere at any time using sophisticated technologies to enhance the quality of education at par with the conventional education system (Arora, 2007).

Inter University Consortium:
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 UGC, AIU, etc. All the open universities in the country can be its founding members while conventional universities as its associate members. NGOs 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).

UGC-CEC:
UGC had established a consortium for educational communication (CEC) in 1993 which is an inter-university centre for electronic media with the following laid down objectives:
• Close coordination, facilitation, overall guidance and direction to the activities of the Media Centers set up by the UGC in various universities.

• Dissemination of educational programmes, through both the broadcast and non-broadcast modes.

• Production of educational programmes (especially video and audio) and related support material and setting up of appropriate facilities for this.

• Research related to optimizing the effectiveness of the programmes.

• Providing a forum for the active involvement of academic and other scholars in the creation of appropriate educational programme.

• Studying, promoting and experimenting with new techniques/technology that will increase the reach and/or effectiveness of educational communication.

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. 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 Educational Media Research Centres and Audio Visual Research Centre, now known as EMMRC.

Gyan Darshan:

The number of educational programmes has increased to 1000 programmes per year from 25 in the beginning. CEC runs a 24hr higher education channel known as Vyas Channel on Gyan Darshan Bouquet which is now also available on DTH. National channel also telecasts these programmes for 1/2 hour daily. The first mission of this channel is to find out knowledge need of the people through research and address the same by developing "knowledge resources" with the help and support of research facilities available in the universities and colleges of the country. The second mission is to bridge this gap making quality knowledge packages delivered by the best teacher available to those
who desire to get benefit from it. The third mission of the channel is to make knowledge free and seamlessly available to all those who need it.

CEC is also having a Media Tape Library with a total collection of about 16000 Educational Video Programmes on betacam cassettes consisting of the categories of collections mentioned below and is available both in English and Hindi and adds about 1000 Video Programmes on various subjects and topics to its collection every year from the Multimedia Research Centers spread throughout the country (CEC-UGC).

NCERT Online:
Yet in another initiative by government of India, a project undertaken by the apex organization NCERT in the form of NCERT online textbooks showed that e-learning can reach to maximum. 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 & Jyoti, 2009).

UNESCO SALIS:
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:

1) Information communication technology (ICT).
2) Information literacy.
3) Information literacy models and standards.
4) Lifelong learning and development of life skills.
5) Information literacy assessment.
6) Information services for disabled people.
7) Freedom of information/Right to information.
8) Sample Information Literacy Programmes for
   a) School library.
   b) College/University library.
   c) Special library.
   d) Public library.
   e) Communication information centers.

The Portal aims to raise awareness, sensitize and enhance information literacy competency skills of common information users as well as information professionals and educators in the South Asian sub-region. Its objectives are fully in line with UNESCO's mandate to bridge the digital divide and UNESCO's vision of knowledge societies. The portal will be developed using Moodle Open Source software, an internationally renowned Courseware Management System (CMS) or (VLE) Virtual Learning Environment (UNESCO).

e-Gurukul:

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 eGurukul 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.

Eklaivya:

Another illustrative open education initiative is Eklaivya, launched by Indian Institute of Technology, Bombay in 2004. In this project, content developed in various Indian languages is distributed over the Internet. The Eklaivya project has developed an Open Source Educational Resources Animation Repository
(OSCAR) that provides web-based interactive animations for teaching. OSCAR provides a platform for student developers to create animations based on ideas and guidance from instructors. Funding for the Ekalavya and OSCAR project comes mainly from private industry. 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. It is envisaged that the ekalavya project will become an all-encompassing activity over the years, using IT effectively for education. It aspires to build large collaborative communities where seekers are matched by the givers. Its eOUTREACH programme creates high quality digital text, audio, video and HTML contents of educational value for knowledge dissemination. This initiative of the Project ekalavya has been funded and supported by the Technology Information, Forecasting & Assessment Council (Ekalavya, 2004).

Tamil Nadu IT Policy:

The Tamil Nadu government announced an IT policy as early as 1997 to put smile to prosperity on the face of every citizen of Tamil Nadu by leveraging Information Technology (IT) to create value and wealth for a knowledge-based society. Objectives for their IT policy are listed as under:

- To establish Tamil Nadu as the destination of choice for IT investments.
- To upgrade the quality of life for the citizens through e-governance and IT applications in government.
- To empower people in rural areas so as to bridge the digital divide.
- To develop Research and Development initiatives.
- To promote use of Tamil in Information Technology.
It has also laid emphasis on IT services being provided in local languages. State government has also organized an international conference on the standardization of Tamil code and keyboard. The government has already given rights to three companies to establish broadband network infrastructure. Tamil Nadu’s vision is to consolidate its leadership position and firmly establish its preeminent position in IT. The large base of engineering institutions in the state is a significant asset. They will be encouraged to interact with industry, centres of excellence so as to have the best match of Industry-Academia. Sufficient mechanism will be created to implement cyber laws. Software piracy, IPR issues and violation of cyber laws will be curbed. In short, the policy will make Tamil Nadu as the ‘Destination of Choice’ for IT investments globally (Elcoat, 2002).

UGC INFONET:
In 2002, deliberations of various committees were held that led to the setting up of the UGC-INFONET towards the end of 2004. 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. 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).

IGNOU Flexilearn:
In 2011, IGNOU launched an online learning portal known as Flexi-learn, which offers free of cost learning by providing free access to IGNOU’s courses. It integrates free learning resources with learning management systems for anyone who wants to learn, whatever their educational needs and experience may be. It has got unique features whereby students find an open and flexible environment to learn and choose their guides as mentors. The personal learning environment also has interactive tools like discussion boards, blogs, wikis, podcasting, RSS feeds etc.
IGNOU LIVE:
In the same year 2011, IGNOU launched another virtual platform for library and information science. For imparting online education, Library and Information Virtual Education (LIVE) in-house content management system was developed. MLIS programme has been launched wherein information access, processing, organization and dissemination are the core components. It is a complete virtual learning environment suite covering all activities from registration to certification with a 24x7 learner support.

Uttar Pradesh IT Policy:
The Uttar Pradesh government planned to achieve 100 per cent IT literacy among government employees by 2002. It decided to introduce computer education in 100 Intermediate schools. As for IT infrastructure, 70 out of 83 districts have optical fibre connectivity. In the hill districts, VSATs will be used in the future.

Satellite E-learning Network:
In July, 2005, the agreement signed between the US and India, six leading American Universities representing the US, ISRO (Indian Space Research Organization) and DST (Department of Science and Technology) 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 IIT, BIT Ranchi, and a few other prestigious Institutions across the country.

NPTEL:
Yet 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. Six major engineering disciplines have been covered in this project so far at the undergraduate (B.E./B.Tech) level. The educational goals set by the Ministry of Human Resource Development are:
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- To make video lectures in a format appropriate for broadcasting that would provide quality content through the Technology channel named the Eklavya channel by the previous Honorable Minister for Human Resource Development in recognition of the first student of distance education named in the great Indian epic Mahabharata thousands of years ago.
- To create web-based (e-learning) material and make it available in the form of a portal / DVDs that would be tailored to meet the needs of engineering students across the country.
- To create a website for NPTEL activity.
- To make e-learning material available in the web for the video lectures to supplement class room teaching.
- To advise target institutions with regard to the software/hardware requirements for benefiting from the national project.

NPTEL has developed curriculum based video courses (110 new courses and 109 existing courses encapsulated in digital video format) and web-based e-courses (129). This has been undertaken by IITs (Seven) and IISc Bangalore as Partner Institutions (PI) and other selected premier institutions as Associate Partner Institutions (API) through a collaborative effort.

In addition to this, a number of core curriculum courses common to all engineering programmes such as mathematics, physics, chemistry, management, electronics, language etc. have also been included. The broad aim of the project NPTEL is to facilitate the competitiveness of Indian industry in the global markets through improving the quality and reach of engineering education. The operational objective of NPTEL is to make high quality learning material available to students of engineering institutions across the country by exploiting the advances in information and communication technology. The target group for this project consists of students and faculty of institutions offering undergraduate engineering programmes in India. A formal Memorandum of Understanding (MoU) between five IITs, four IIMs and CMU established a Virtual Centre for Technology Enhanced Learning (VCTEL).
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. This proposal was submitted to MHRD in 1999 and revised several times (EGP-AICTE-NPTEL, 2006).

UGC Networking:

In a small town called Lohari in Maharashtra, a student of a technical college told the UGC Chairman that he was not worried if his Professor taught him or not as they downloaded materials from the Internet. This incident reflected the UGC’s thinking in reaching out to rural areas. Each university will be encouraged to establish a local area network (LAN) to enable connectivity within the campus and to establish a larger network for connecting all colleges under its jurisdiction. The sites will serve three main purposes: enabling universities to share library resources and research journals, providing teachers and students with access to information available on the internet and other multimedia educational material; and helping teachers develop their own multimedia courseware. The UGC plans to invest Rs 150 crore over the next 5 years in this.

Shiksha:

The recent 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 $20 million for training the trainers in the e-learning programme, also known as “Shiksha”. Under this, 80,000 teachers and 3.5 million students would be trained between a period of 3 and 5 years. The collaboration would be done in partnership with the Department of Information Technology (Nikam, Ganesh and Tamizhchelvan 2004).

24x7 learning (2009):

India’s premier 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 hours of online classroom sessions to facilitate the learning process. 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.

3.9 Need for E-learning in LIS-Education in India

E-learning should be adopted in LIS education for the following reasons:

(a) Management of Change

Like most other institutions libraries are also facing dramatic changes in its dimensions. Particularly, the growing use of ICT in library activities is enforcing many changes. However, the staff working for many years in libraries may not be well-convergent with the ICT. The reason could be the emergence of ICT long after them and their education. The ICT terms like metadata, thesaurus construction, ontology, taxonomy, electronic Dewey, information literacy programmes, open source software for library management, digital library, digital library software, creation and maintenance of institutional repositories, Web 2.0, Library 2.0 technologies and their use in libraries, HTML, XML, knowledge management, web design, copyright implications in the digital library era, etc. might be a bit difficult for them to comprehend. E-learning is the most suitable teaching-learning method for imparting education on such important and useful topics in LIS.

(b) Modular or Cafeteria-based Learning

Most of the undergraduate courses are of three years duration. The postgraduate courses are of two years duration. This 3+2 years pattern of education is common in LIS education also, and does not allow studying topics which are peripheral to the core subject of the degree. As a result, there remain some topics which the potential LIS professional desires to study, but not been
able to do so due to the set pattern. E-learning will certainly help to overcome this problem because it allows creating customised learning modules as per the need of the learner.

(c) Increased Expectations from the Employers as well as Users

All potential library employers expect that the LIS professionals must have optimum skills and thereby efficiency in their housekeeping operations. They also expect that the library staff should be able to provide library services effectively. The users of the library also have similar expectations. They feel that the library staff must answer their reference and referral queries quickly and accurately. One common expectation of both these stakeholders is that the LIS professional of any cadre must have skills to use ICT to provide efficient library services. Thus, the ICT handling skills have become an essential qualification for the LIS professionals. Due to time constraint, in-service library professionals may not be able to attend regular LIS courses. In such a situation, the e-learning remains the most viable option for in-service LIS professionals.

(d) Multi-skilled Personnel

The present employment market expects that their potential employee must have multiple skills. The skills required by libraries are changing. A study indicates that library staff needs more and newer skills. The workflow is changing. The classroom-based, traditional pattern of LIS education may not allow the library staff to have multiple skills. Through e-learning they can acquire more skills at their own pace and time.

(e) Job-Specific Needs

The traditional LIS education, particularly in India, is a general LIS education in the sense that the learner of this system of education does not get specialised in managing a specific type of library. The learner does not get special/depth education for any specific information technology or on designing tools like ontology or a digital library. The above requirements are environment specific, where the LIS professional is working after having the basic LIS education through the traditional methods. E-learning offers the opportunity to provide
education, which is job specific and will help LIS professionals to perform to the optimum extent.

(f) Image of the Profession
The e-factor (electronic factor) is an image building factor. As such the provision of e-learning, if made available by the LIS educational institutions, will definitely improve the image of LIS teaching profession.

(g) More Content and Short Duration
In India library science is mostly taught as a postgraduate course (there are some undergraduate and certificate courses also). These courses are of one- and or two-year duration. New subjects, aspects, facets, are continuously emerging in LIS. The quantum of knowledge and skills to be imparted to the upcoming LIS professional are continuously increasing. It is difficult to provide all this knowledge and impart all expected skills in one or two academic duration. So the subjects which could not be taught/ studied during regular courses can be taught through e-learning.

(h) Changing Learning Trends
The changing learning trends are of part-time/home learner. To respond to these trends the LIS education should adopt the e-learning.

The scope of LIS education in India has undergone sea changes with the rapid expansion of research and development activities, particularly in the area of Information and Communication Technology (ICT). For qualitative improvement of LIS education in India, there is a need to introduce new courses based on ICTs in different LIS schools to face new challenges. In fact, technology has not only affected operations of library services but also LIS education itself. There is a need to integrate qualitative changes in LIS education to:

→ Increase excellence of LIS students to meet the growing demands in e-environment.
→ Face challenges due to the growing influence of ICT and its impact on LIS education.
→ Suit ever-increasing demands for trained LIS professionals.
→ Amplify career opportunities for LIS professionals.
→ Use Internet-based e-learning courses which are growing day-by-day.
→ Adopt and promote e-publishing which is being fast accepted by the users.
→ Transform traditional and habitual mode of LIS education in India.

Appropriate utilization of technology for imparting LIS courses can produce better results. It has now become indispensable to consider the utilization of online learning environment in LIS education.

The main objectives as per Naik (2006) for providing LIS education in online environment must be:

→ To cover broad perspectives of the core principles of Library and Information Science and its applicability in the new milieu.
→ To understand the managerial activities of Library and Information systems in present context.
→ To comprehend the principles of knowledge organization, management, retrieval and delivery.
→ To develop practical skills in new online virtual environment to countenance the challenges.
→ To meet the demands of new digital era.
→ To educate learners in the tune of market demands.
→ To offer online information skills.

The education and training in LIS in the digital environment according to the study of Singh & Devi (2009) shall contribute to accomplish the following:

- Extensive theoretical and practical knowledge of information management and Business.
- Behavioural attitudes and understanding and information needs of individuals and institutions
- Financial and quantitative methods of analyzing organizational information
- Problem solving methodology
• Analytical abilities and critical thinking expertise  
• Research theories and practices  
• Human resource management and quantitative practices and management  
• Competence in information handling  
• Online information skills  
• Expertise in the use of electronic information  
• In depth understanding of information organization, marketing and using information retrieval systems  
• Analytical abilities to access information and to understand the principles of the organization of knowledge  
• Practical experience in information retrieval, indexing, cataloguing and classification of information resources  
• Information management in various professional contexts.

The University Grants Commission (UGC) Model Curriculum Report, 2001 lists six levels of courses in Library and Information Science education in India, starting from Certificate course, Diploma, Bachelor (BLISc), P.G. Diploma (PGDIT, PGDA& PGDLAN), Masters (MLISc) to M.Phil and PhD. The courses are being taught by formal universities and deemed universities (both regular and distance stream), open universities, degree colleges, polytechnics, associations and even Government departments. After independence, various colleges, universities, educational institutions and learned societies were emerging and the need for professionally qualified personnel to manage their libraries was realized. As a result, the number of library science schools started to increase. Library associations which exist at various places started providing training courses (Singh, S.P. 2003).

After 1980, various open universities came up which offered courses in Library and Information Science in distance mode and today there are more than 20 Library and Information Science schools in India offering LIS courses through distance mode. Dr. B.R. Ambedkar Open University, Hyderabad (then known as Andhra Pradesh Open University) is the first Open University in India
offering Library and Information Science programs through correspondence at Bachelor's Degree and Masters Degree from 1985 and 1998 respectively, followed by the university of Madras, Indira Gandhi National Open University (in 1989) started BLISC and later MLISc and PhD programs. There are also some other open universities in India offering library science courses as Annamalai University, Algappa University, S.V. University Tirupati, University of Madras, Madurai-Kamaraj University, Madurai etc. The growth of distance education programmes in India has created an outbreak in the library profession as unwanted quantitative expansion affected the professional caliber and the quality of education being imparted (Naushad & Samar, 2006). But today, we are witnessing a global shift in the delivery of education brought about by the information and communication technologies known as e-learning.

Internet has emerged as a most important form of global communication and information exchange and it brought the online mode of education to the forefront. Through e-learning users may get any form of text, graphics, audio, video, animated graphics, and computer programs. It is the fusion of technology with education. "The major advantage is the consistency that e-learning provides. E-learning is self-paced, and learning is done at the learner's pace. The content can be repeated until the trainee understands it. It can be made compelling and interesting with multimedia, and the trainee can be given multiple learning paths depending on his or her needs," (Bandhuni, 2005).

In India, Ministry of Human Resource Development (MHRD), under its National Education Mission on Information and Communication Technology (NME-ICT) had assigned the job of content creation in various subject fields to UGC at post graduate level and a gateway has been developed known as ePathshala.
Figure- 4: e-PGPathshala Content Development Portal

Figure- 5: Content Development in e-PGPathshala for LIS

Another e-learning portal has been designed for online learning and training known as Sakshat. It has been developed to facilitate lifelong learning for students, teachers and those in employments or in pursuit of knowledge free of cost.
According to International Data Centre (IDC), the revenue earned worldwide from e-learning was 6 billion US $ in 2003. That was expected to rise to 21 billion US$ by 2008 and in the year 2011, it has grown beyond 60 billion US dollars. NASSCOM reports that Indian companies will get revenues of 7 to 9 million US$ by end-2005 and as per the latest report 2013, the Indian companies have earned the revenue of around 117 million US$ which was beyond the projected figures. It is evident from the above figures that the e-learning market in India is still in emerging stage but emphasis is being laid on perfecting the individual skills of learners because of which e-learning is becoming popular in India. In India, e-learning has been most successful in the corporate segment where it is seen as a means of achieving business goals and motivating employees. Many companies are involved in e-learning projects like Gurukul Online, Med Varsity, EduTech, Wipro, Tata Consultancy Services, Knowledge Pool, Brain Visa, Sify learning and are taking up new projects in collaboration with open and private universities for online learning.

3.10 Challenges to E-learning in LIS-Education

Some of the challenges that e-learning initiatives from the Institutions of Higher Education in LIS education could face are:
• For those Institutions offering online e-learning course, awarding a recognized degree for students might become imperative. Most students and the in service employers are happy only when a certifying endorsement is given.

• A fall out of the above could be escalating a number of online institutions offering courses with spurious certificates, which may not have any value.

• Since, the e-learning method is self-paced and self-learnt, the attention length of the student may not be enough for him/her to learn a concept.

• Generally the duration of the course also matters in this mode of lecture delivery.

• Lastly, the Legal implications of e-learning come into play. As e-learning over internet is across geographical boundaries, this makes it all the more, tougher for the enforcing authorities to have a global legal framework for the net offender.

• Measuring the level of success and the Return on Investment would be difficult.

(a) Cost
While delivery costs of e-learning are significantly reduced compared to costs associated with classroom learning delivery, especially when large numbers of learners are involved (Rumble, 2001), initial development and purchase of e-learning products represents a major barrier to the adoption of e-learning training within organizations. This claim is substantiated by evidence from a survey conducted for the Office of Learning Technologies (OLT) in Canada, which found that cost was the single most important factor preventing employers from investing in e-learning (Dugas, Green & Leckie, 1999). In any case, organization must weigh the initial costs of developing e-learning against savings accrued from economics of scale at delivery time.

(b) Lack of time
Lack of time as an obstructing factor comes second, after the cost barrier. Long development cycles prohibit many institutions from engaging in production of
custom e-learning training. Lengthy time-to-promote is especially true for small institutions who have limited capacities to produce complex, media-rich, highly interactive and customized solutions. As a result, an increasing number of institutions are starting to outsource their e-learning activities to an application service provider (W.R. Hambrecht et al., 2000c). The trend toward the Active Service Pages (ASP) model is still very slow mainly because institutions have proprietary content, highly confidential in nature, which they want to protect.

(c) Content Incompatibility and Penury
Locating appropriate off-the-shelf e-learning material or converting custom e-learning (i.e., classroom-based) material for use on an e-learning platform proves a major challenge for institutions. The difficulty resides primarily in the lack of interoperability between content materials purchased outside the company on the one hand, and both proprietary content and in-house applications. Additionally, content interoperability is also an issue when converting custom, in-house training products into online products due to technical incompatibilities. In consequence, the shortage of high-quality content, especially for the soft skills area, is hindering the adoption of e-learning by institutions that still rely on e-learning as a short-term solution.

(d) Human Resistance
Enthusiasm for e-learning technologies is limited for those who do not have the skills to use the technology, think it is more cumbersome than traditional tools or simply prefer the human interaction provided in instructor-led training. Considerable evidence of the prevalence of e-learning in the workplace was gathered in surveys by IDC who found that 70% of respondents preferred instructor-led seminars and training.

Consistent with these results, 88% of learners and 91% of managers expressed the desire to have a trainer assigned to an e-learning experience (Masie, 2000). These statistics seem to indicate that e-learning solutions are blending with traditional delivery methods rather than supplanting them, a trend reflected in the growth of “surrounds” or online meeting places offering supplemental
materials and communication space for learners as a way of extending the instructor-led classroom. Blended learning, a mix of e-learning may serve as a transition step to allay fears and build learner acceptance of e-learning.

(e) Technological Barriers
Severe limitations of technology infrastructure also serve to hamper enthusiasm and the widespread use of e-learning technologies. These restrictions range from inadequate network speed and bandwidth capacity to incompatibility across different platforms and between different content materials. Bandwidth refers to the capacity of a communication channel to carry information (e.g., text, graphics, audio and videos). Insufficient bandwidth was rated as the most significant barrier in a survey where 65% of those surveyed indicated that increased transfer speed would result in increased usage for them. On a positive note, software, hardware incompatibility and low bandwidth are poised to improve rapidly as standards for interoperability are being developed.

3.11 Implications of E-learning in LIS-Education
In the present era of information super highway, e-learning opens new expectations and aspirations in LIS education, services and profession. Library and information services are rapidly changing as a result of:

- Demand for increased efficiency and accountability;
- Requirements for new services;
- Increased demand for 24x7 services and;
- Opportunities offered by e-learning.

The development and expansion of these new services and activities is often associated with changes in the organizational make-up such as the convergence of the library, ICT, or the expansion of the information services to include educational advancements, training and or e-learning. Library and information workforce in organizations that use online virtual learning environments, e.g. colleges and universities, are likely to be occupied with them at a number of different levels:

I. Strategic level

- Development of organizational learning and teaching strategy.
• Decisions about the selection and purchase of VLEs (Virtual Learning Environments).

II. Operations level
• Managing and advertising the VLE, e.g. configuring the system, providing learning spaces for developments, programmes or tutors.
• Managing and administering copyright and other intellectual property issues.

III. Teaching and learning
• Setting up and establishing specific e-learning environments such as design of site, design and development of materials, uploading of materials, identification of web links and organizing staff.
• Training staff and students in the use of the VLE, and also providing technical help and support.
• E-tutoring, either as a co-tutor on an academic or vocational program, or tutoring their own programmes.

Besides these, it is having an impact on individuals in the following areas:

New Opportunities:
E-learning offers new opportunities for library and information professionals to develop their knowledge and skills in a wide range of areas.

Acquiring information skills:
Sometimes e-learning activities involve traditional information knowledge and skills, and to get involved in working in a new ways with new groups of people. E-learning makes the information workers more confident and competent in the use of ICT.

Roles and responsibilities:
Information professionals are developing new roles and responsibilities within library and information unit through e-learning. In addition, many library and information workers have moved out of the information unit and are now managing learning centres, educational development centres or learning materials units.
Different professional collaboration:

In many organizations e-learning means that library and information workers are working together in new ways other professional groups, e.g. subject specialists, educational developers or ICT specialists. However, in some respects it is giving flexible opportunities that reduce time, money and travelling hassle.

3.12 Discussion

In present age, information needs are changing and demands of this profession are also varying. The change is enforced by many forces such as technology, demographic features, economic characters, etc. E-learning is now the global scenario and we must avoid confrontation. The LIS education is responding to these changes by making appropriate changes in its teaching-learning strategies. Adoption of e-learning in LIS is robust indicator of this response. As a developing country like India, it is arduous to design a new courses and new e-learning LIS-education. Lots of issues and challenges are involved with this task but as soon as it is put forward, it will surmount all those problems. The Indian LIS education too, is slowly but steadily making progress in this direction. Availability of appropriate and adequate infrastructure will add momentum to LIS e-learning in India. The establishment of the Indian Training and Education Network for Development (INTEND) by the Ministry of Human Resource Development, Government of India is a good approach of the government. The initiatives taken up by IGNOU are a good signal in the country. Web-based or electronic mode of teaching has become an important component of LIS Education in India. The use of new ICT by the Indian LIS Schools should be encouraged to produce professionals to manage knowledge resources in the electronic learning environment.
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