

# E-Learning: Liberation of Education and Training with Evolving Library and Technology Support

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## ABSTRACT

Support of the library has always been traditionally considered imperative for the completeness of education. Even in the current electronic technology mediated e-learning, the evolving form of the library is considered necessary. It is remarkable that the same technology means are driving both the e-learning and library transformation process. A library professional having acquired such technological skills can therefore add value to the e-learning process. The paper discusses the impacts of e-learning on the learner, teacher, and library using the framework of the laws of media enunciated by Marshall McLuhan. It further discusses how e-learning and new form of the library fit well in the emerging concept of self-service society. To spread the modern education to the remote corners of India, a strategy of promoting the e-learning aided by the advanced library and technology is recommended.

**Keywords:** E-learning, library transformation, McLuhan's laws of media, self-service society, web intelligence

## 1. INTRODUCTION

In India, thousands of young students, despite having right aptitude and necessary talent, are denied admission to the courses and institutes of their choice simply because of the limited physical classroom space and other resources with the academic institutions. It is besides the issue of quality versus quantity in education. Again, consider the lack or absence of suitable avenues for persons badly needing mid-career re-skilling or taking a few specialisation courses without compromising or dislocating their respective occupation and responsibilities. To address such needs the concept of distance education was introduced on a large scale in 1960s. In India, distance education mode of imparting education got a boost with the establishment of the Indira Gandhi National Open University (IGNOU), New Delhi, as the central university by the Act of the Parliament passed in 1985. Over the years it has emerged as a role model for other universities in India to start the distance education stream. Besides serving the Indian students, IGNOU has now enrolled students from more than 35 countries. It has also established a Distance Education Council to set norms and standards for the distance education in the country.

Initially, the institutes imparting distance education used to supply the course material in the print form and evaluate the enrolled students through periodic written assignments and conducting examinations at various centres. For the benefit of students some of these institutes organise a few contact sessions with teachers and counsellors. This learning process has suffered mainly on account of either total absence or slow cycle of exchange between subject specialists and students and most importantly, the lack of adequate library support to the students to go beyond the supplied notes and explore the subject in further details.

The distance education in India received a tremendous impetus with the availability of affordable computer and allied electronic technologies in the mid 1990s. As a result several courses are presently conducted using these new tools where the interaction between the student and teacher is facilitated using electronic means. Due to predominant use of the electronic products, this way of imparting education is popularly called as e-learning mode. This term is alternatively used with many other terms like computer-based or online learning, web-based learning, and computer-

supported collaborative learning. The core of the e-learning process now is the electronic networking of learners, teachers and supporting systems like library and databases.

E-learning removes physical obstacles like space and travel, and makes material available in variety of forms. It facilitates interaction among students, thereby allows them to learn from each other. It also overcomes the problems faced particularly by the housewives and physically challenged students as well as faculty in participating in learning. E-learning will however remain far from complete till it is well supported by the modern library that provides access to digital databases and other electronic resources, and extends web-based services. The advances in the information and communication technologies (ICTs) assist integration of the e-learning and modern library because it is driving both these developments<sup>1</sup>. This paper briefly reviews the evolution of learning process highlighting the shift in the learning philosophy and change in the roles of teacher and the library.

## 2. SHIFT IN THE LEARNING PROCESS

Over the years, learning has remained a face-to-face activity. Still it is considered as a best practice, at least for the school and undergraduate course students. It is justified on the grounds that relatively raw and young students have to learn many other things besides the subject knowledge through physical interaction with teachers, classmates, libraries, and by participating in sports and social activities. However, as the demand for courses, both of the conventional colleges, universities and professional streams, started increasing, the requisite basic infrastructure like classrooms, laboratories, and libraries was found woefully lacking. Difficulties in finding wherewithal for such infrastructure expansion promoted the concept

of distance education where the enrolled students need not visit a classroom. The study material and lecture notes are supplied to them for study and to appear for the examination as and when conducted. With the advent of computer technology, a choice in the form of course material in the digital medium like floppy disk, tape and compact disk (CD) for use by the student on a computer system at his end got introduced. Next, with advances in the computer networking technology and improved accessibility to the WWW and the Internet, the option emerged to take the courses fully online. Thus e-learning gained in popularity for a vast section due to its certain advantages like fast and flexible delivery, enriched material in multimedia format, and global level participation in discussions.

As shown in the Fig. 1 (left half), physical library has always been a mainstay of the traditional pedagogical process when it was confined to the physical classroom learning environment. In the new electronic technology, also called virtual learning environment (Fig. 1 right half), the library and information technology are sharing that burden in a different way as learning takes place outside the classroom. Moreover, the library itself is undergoing transformation in its form and services, necessitating requirement of special instructions and skills to make proper use of the new form of the library as well as ever evolving information technology in the first place. It is worth mentioning that in the expansion process, a substantial shift in the focus of learning has taken place. Learning should be done by *action* as stressed by Socrates, gave a way to *method* of Plato and ultimately to *logical procedure* as advocated by Aristotle<sup>2</sup>. This shows that emphasis of learning process moved away from changing the learner to the one of assimilating the knowledge as shown in Fig. 2. It is however realised that learning devoid of practice, i.e., testing it through actions, is incomplete to a large extent.

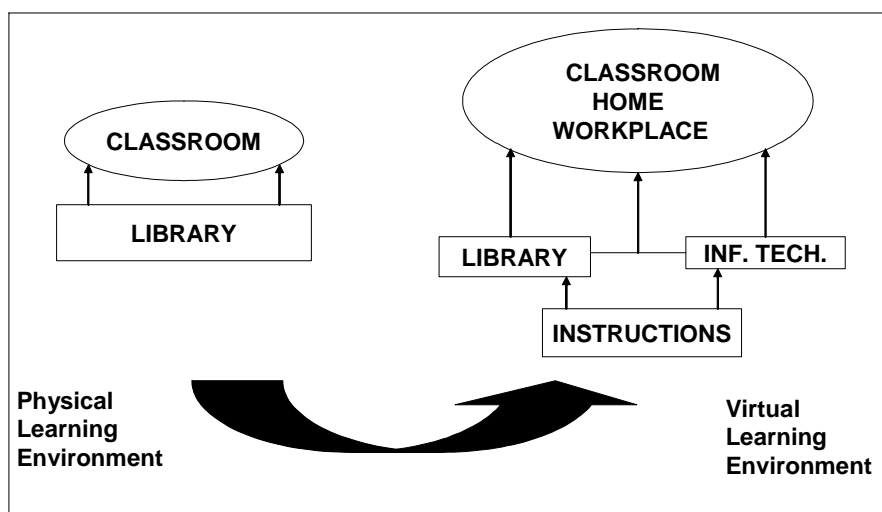


Figure 1. Learning process expansion.

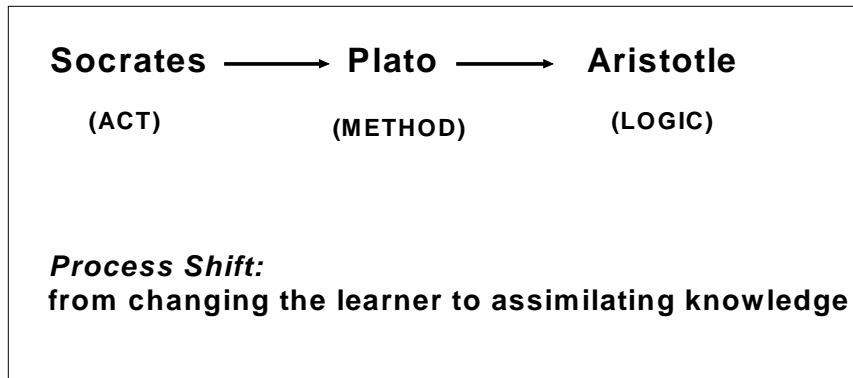


Figure 2. Shift in the learning focus.

Like the learner, the role of the teacher has also transformed in this process. As shown in Fig. 3, classical blackboard-based teaching is now getting replaced or supplemented by imparting lessons through videoconferencing or web-based methods, corresponding with the students using e-mail and forming a cohesive team with students through close interaction. When such a technology is used as a central teaching tool, the teacher becomes a facilitator and students take on a proactive role in learning. Often, this change of teaching philosophy and methods leads to learner-centered teaching and constructivist teaching practices<sup>3</sup>. A significant value-addition to the processes of imparting knowledge and instructions is brought about by these modern technology-driven methods that make liberal use of high impact graphics and animation, and demonstrate real-life applications of the concepts.

Like academic institutions, the corporate sector has found e-learning as an attractive option to organise training for its staff that is located across the country or internationally in this globalisation era. Instead of assembling the trainers and trainees at one location, using the means like teleconferencing and web-based seminars for conducting in-house training programmes is found cost-effective by many companies. Even

quite a few mentoring programmes are conducted by this method where a tele-mentor remains in close touch with his dispersed group employing the Intranet and e-mail facility. An exhaustive treatment of e-learning along with the contemporary trends is available<sup>4</sup>.

Realising the potential of e-learning, several types of e-learning centres are getting established. Some of them are within the organisations to serve their employees, while others like public access centres are located in libraries, community centres, and academic institutions of higher learning. This trend is picking up in India and many private universities are offering their courses through e-media and gaining adequate patronage. Many companies find outsourcing their routine training to such third-party e-education centres more cost-effective. Further, quite a few firms engage such centres to employ e-learning for customer education by way of training in use of the products and services.

Managing e-learning centre to a large extent is similar to the managing a modern library with additional requirement of establishing close collaboration with subject specialists. A library professional, therefore, with suitable training and aptitude in the use of information and communication technology (ICT), and some experience

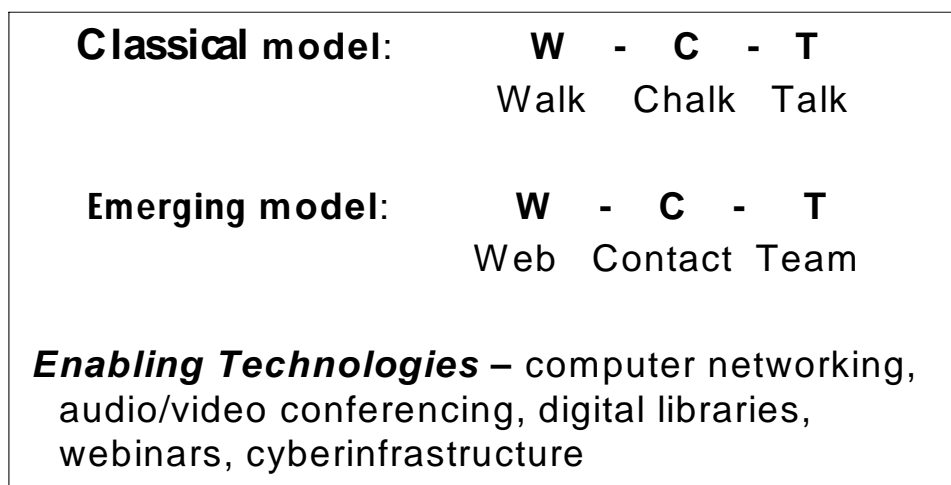


Figure 3. Changing role of a teacher.

of e-learning itself can exploit this opportunity. It may look like as a totally new career but in essence it can be treated as an extension of the library profession. This is clearly seen from a review of the technology tools that support the e-learning process as given in the next section.

### 3. AN OVERVIEW OF THE E-LEARNING TOOLS

A plethora of ICT or virtual communication tools are now available that are employed in the e-learning process. Most prominent among them are given below. Some of them are asynchronous in character and provide on-to-many type of communication facility. They are primarily useful for information exchanging, networking, repackaging knowledge, providing instructions, undertaking collaborative project work, mentoring and organising online discussions, and meetings.

- ⊕ E-mail
- ⊕ Mailing lists or list-servs
- ⊕ Newsgroups or usenets
- ⊕ Bulletin boards
- ⊕ Instant messaging
- ⊕ Polling
- ⊕ Webforms
- ⊕ Chat or conferencing
- ⊕ Internet telephony
- ⊕ Videoconferencing
- ⊕ Blogs
- ⊕ Learning portal or web-based training portal.

Some of the above tools are multi-functional. For instance, a tool like learning portal helps building a complete virtual learning environment. Access to resources and e-learning facilities including web-based training materials, support, and guidance are its hallmark. In addition, the administrative tasks like tracking the performance of students and usage of material are also possible.

The above listed tools, along with a few more, form an enabling infrastructure to sustain and promote participation in the e-learning and teaching irrespective of the physical location of the participants and time zone. Since face-to-face physical exchange is not possible for such a dispersed group of learners the support provided by such tools is vital. It usually binds the group participating in a training or academic

course in the form of a 'community of practice'. A community of practice is formally defined as, "A special type of informal network that emerges from a desire to work more efficiently or to understand work more deeply among members of a particular specialty or work group"<sup>5</sup>. This concept extends the traditional networking and collaborative work to focus on the importance to the individuals of becoming involved with different groups, and profession's knowledge and practice. Memberships of such a community are relatively low, say about 25, and formed either by self-selection or invitation. Corporate sector encourages its staff members to join such communities as that proves mutually beneficial. Formation of a community of e-learners on the above lines will help them to learn from each other and get a wider perspective of any issue.

A library professional is using most of the above mentioned tools in organising modern library services like alerting the readers about new relevant references by e-mail, integrating information from various sources and disseminating it to the concerned user or a group of users by mass messaging, setting up bulletin boards and blogs devoted to specific professional topic or theme, and conducting web-based surveys to assess the quality of services and usefulness of the library material. A library professional with technical skills can therefore readily contribute to various components of the e-learning process.

### 4. EVOLUTION OF THE LIBRARY

It is appreciable that library profession has kept pace with the evolving technology and changing information needs of the academics, research, industry, government, and other institutions. The transformation of the classical library, from a mere document storage and exchanging entity to the one providing access to its collection and other information irrespective of the user location besides enhancing the scope of services to cover the electronic databases, e-journals and web-based services, librarian's demonstrates extended supporting role in tune with the time. The progressive change in the library over the past five decades and its expected form in future is envisaged as follows<sup>6, 7</sup>:

**Brick and Mortar Library:** A fixed physical premises offering services to the users who visit physically to the library. The services are restricted by the time constraint. The collection is predominantly paper-based and information retrieval tools are manual and broad.

**Digital Library:** Substantial amount of material in the library is in the digital form. Users can access it through the local or wide area network. The OPAC

catalogues form a basic information search tool, and accessibility to the material is not time restricted.

**e-Mobile Library:** The library member, irrespective of location and time, can completely access the normal library services through a hand-held electronic device like mobile phone or a personal digital assistant (PDA). All the services are integrated and provided through a single access authentication point like one password.

**Ubiquitous Library:** The tiny technological devices of future would be distributed throughout the human environment, thereby enabling constant access to the library material and services from anywhere.

In India, quite a few academic and institutional libraries are currently in the partial digital library stage. They provide access to the select online databases, electronic journals, and a few web-based services to their members. The organisations like DELNET and INFLIBNET are providing various services to a large number of their institutional member libraries to serve their readers. Of course, we have to go a long way in modernising our libraries particularly the public libraries, which can help those learning through distance education mode.

## 5. E-LEARNING AND THE LIBRARY

In recent years, the association between the e-learning and library has been a topic of several studies. For instance, a comprehensive review of e-learning technologies, teaching and learning models and the role and opportunities for the library and library professionals to meaningfully contribute to e-learning has been made by Allan<sup>8</sup>. The taskforce of the online computer library centre (OCLC) has also recommended various strategies especially for the academic libraries to facilitate the enhancement of e-learning<sup>9</sup>. Attempts made by the IGNOU for continuing education programmes

for LIS through e-learning are documented too. Recent developments by the IGNOU in the form of creating 'eGyanKosh', a national digital repository to store, index, preserve, distribute, and share the digital learning resources developed by the open and distance learning institutions in the country and establishing an e-learning platform called *LIVE* for library and information science virtual education are useful<sup>10</sup>.

It is clear that the library would continue to play its facilitator role in the e-learning scenario. The task now involves dealing with both print and non-print including digital material, assisting the production of course material, managing the copyright issues, frequent updates of various databases, and website maintenance. A summary of the library inputs for developing respective component of the e-learning process is given in Table 1. Evaluation of electronic databases and electronic journals, selectively integrating the material from various sources for specific courses, digital assets management for wider access, creating learning resource catalogue where the learning resources are organised according to meta-tags are the examples. In sum the library is expected to serve as learner support in the e-learning process.

The library professional is also now expected to promote information literacy (IL) among the users. The set of skills needed to find, retrieve, analyse, use, and manage information defines the term IL. It differs significantly from the traditional reference service where it is assumed that a user would approach the desk with a query. The IL programme aims at user to access and assess the library and other material independently. It practically means the library has to teach the following skills:

- ⊕ Library literacy
- ⊕ Media literacy

**Table 1. Contribution by the library in the e-learning process**

S. No.	e-learning process	Library involvement
1.	Pre-authoring	Collecting the material in different formats by searching wider databases and help filtering it for appropriate level of learning
2.	Content Development	Providing suitable metadata for the material to facilitate interoperability and reuse of the information
3.	Course Management	Ensuring that copyright and intellectual property rights are not infringed while using the material besides curbing the copy-paste tendencies
4.	External Database Interface	Designing virtual reference service and assimilating knowledge generated in the e-learning process
5.	Delivery	Providing a package of information suiting to the individual preference
6.	Evaluation	Formative evaluation to know about implementation and summative evaluation to ascertain full impact and outcome of learning

- ⊕ Computer literacy
- ⊕ Internet literacy
- ⊕ Research literacy
- ⊕ Critical thinking

To impart the above skills to the remote learners using the technological means alone is undoubtedly a huge challenge for the library and library profession. It is recognised that the library itself would need restructuring in many cases to meet the new demands like supporting the e-learning activity and promoting information literacy. A systematic plan employing modern tools of operations research and management science, which integrate viewpoints obtained through consultations with analytical processing, can assist this library transformation process<sup>11</sup>. This area needs serious attention by the researchers and library managers.

## 6. IMPACTS OF E-LEARNING

With his far-reaching insight, Marshall McLuhan (1911-1980) had aptly perceived the future of communication in the wake of emerging information production and dissemination revolution though he did not live to see the proliferation of personal computer and the subsequent developments. Besides introducing the idea of 'Global Village', he propounded that technology, and for that matter any man-made system brings into force four types of impacts, namely, enhancement of features; obsolescence of some limitations and practices; revival of unwelcome effects; and retrieval of cherished dreams. And importantly, all these four impacts happen simultaneously. They are now known as McLuhan's four laws of media<sup>12, 13</sup>.

It would be interesting to explore the impacts of e-learning in this framework. An illustration of the impacts of e-learning according to McLuhan's laws is presented in Table 2. Potentials to increase the accessibility of a training or academic course, introducing flexibility in both teaching and learning, and providing the study material in multimedia format are enhanced (box I). On the obsolescence side the e-learning is expected to remove several barriers for course admission that are currently observed due to physical infrastructure

constraints like classroom space (box II). The dream of obtaining the lessons from the best teacher and participating in discussions on a global scale are retrieved (box III). At the same time, the e-learning process introduces several rigid digital authentication systems to thwart threats like introduction of computer virus, and identity theft and information manipulation that can subvert the network operations (box IV).

At the next level, an attempt is made to analyse various impacts of e-learning on the learner, teacher, and library according to above stated four laws of McLuhan. The results are presented in Table 3. The likely positive impacts, as seen from the rows I, II and III in Table 3 augers well for the e-learning, but serious attention must also be paid to the row IV, which reflects the noxious effects. For instance, being constantly tracked would be resented by the learner, while a teacher would not like to be on a trail all the time, and a library loses all its human warmth and becomes a digital repository that works mechanically under the instructions of say an expert system and not a library professional who can be approached for advice on many other matters too. Missing of the moral dimension of commitment, which is an important characteristic of face-to-face interactions, is also highlighted by Dreyfus in this context<sup>14</sup>. It is argued that e-learning largely depends on writing mode for exchange and many students are not comfortable with that mode of learning. Moreover, the subjects that need hands-on tutoring may not be properly covered by the e-learning process. It is expected that further advances in the e-learning tools would address these issues<sup>15</sup>.

Exercise in the above format can help assessing the impact of any specific e-learning course or technology tool. Designing a suitable strategy to make the best use of the e-learning while avoiding or minimising the ill effects can thus be achieved.

## 7. TOWARDS SELF-SERVICE SOCIETY

On a broader sense the e-learning process and the library promoting IL as discussed above are in conformity with another social change, namely, transformation of a society into a *self-service* society. In the western developed countries due to factors like

**Table 2. E-learning and McLuhan's tetrad of impacts**

<b>I. Enhancement</b> - Outreach of a course - Flexibility in learning and teaching - Study material variety	<b>IV. Revival</b> - Gate-keeping operations - Information manipulation
<b>III. Retrieval</b> - Dream of interacting with the world-class faculty - Universal participation in learning	<b>II. Obsolescence</b> - Limited enrollment - Traditional class-notes taking practice - Long feedback response cycle

**Table 3. E-learning impacts on the learner, teacher, and library under McLuhan's framework**

<b>Learner</b>	<b>Teacher</b>	<b>Library</b>
I. Intensifies exchange of information and views across the globe	I. Enhances the variety of responses and cross-cultural discussion among participants	I. Widens its database and serves the users with greater amount of relevant material
II. Renders obsolete physical travel to the classroom	II. Renders obsolete the restrictive practice of campus-based teaching alone	II. Renders obsolete the old model of physical material based services provision
III. Retrieves archival information that is currently not attempted due to efforts involved	III. Retrieves the possibility of spotting and mentoring a talent located at anywhere on the globe	III. Retrieves the full benefit of the material that is not bound to print form alone
IV. Flips into cautious interactions as being monitored continuously	IV. Flips into self-imposed restrictive mode as being questioned constantly	IV. Flips into a isolated electronic entity with no human warmth in providing guidance

declining and aging population and mounting cost of person-based services a trend toward self-help for many services started a few decades back. Self-service department stores or malls, ATM banking, self-diagnosing machines, and many similar devices and services were designed to promote this concept. Rapid advances in the electronic technology and user-friendly devices are now driving this trend. Even in the field of medicine and healthcare the economic analysis shows the marked benefits of self-service practice on a significant scale<sup>16</sup>.

Traditionally, both education system and library system, involved two distinct components, namely, a physical service provider, and consumer interacting at a fixed location and time. Till the advent of the modern information technology there was no viable alternative available for that model. However, e-learning supported by digital library has eliminated the constraints of physical space and time for imparting modern education and training, particularly at higher levels. Here too the economics is in favour of e-learning. With this benefit in view, India launched an exclusive satellite EDUSAT, in September 2004. The EDUSAT networking is being implemented through various agencies to ultimately reach all the districts in the country. Presently, for instance, daily conduct of sessions on technical topics via the EDUSAT is greatly facilitating the students and faculty of 120 engineering colleges affiliated to Visvesvaraya Technological University of Karnataka. Likewise the students of Yashwantrao Chavan Maharashtra Open University and Rajiv Gandhi Technical University, Madhya Pradesh, are getting the benefits of such services. More than 2,500 schools in the backward districts of the country lacking adequate teachers and other facilities are already covered by EDUSAT operations and thereby providing those students

an opportunity to get modern education. Wider usefulness of this system can be understood by the fact that 10 schools for blind in Gujarat are served by the special transmission organised via EDUSAT<sup>17</sup>. This distant mode of teaching and learning may not strictly fall under the concept of e-learning, but it prepares the ground for continuing education through e-learning stream in future.

On the higher end of the spectrum, the development of the concept of web intelligence, which incorporates practical utilities of artificial intelligence and advanced information technology in the next generation of web-related products, systems, services, and activities, is expected to contribute significantly to self-learning. Some of its products like intelligent web services, semantic markup, and web mining are expected to boost the e-learning in a significant way as discussed below<sup>18</sup>. For example a proposed expert system called *Educational Servers* would have enough capability to arrange for personalisation of the learning tasks to act as an intelligent tutor with both domain and pedagogical knowledge. It would also keep track of the learning progress of individual student and deliver the course accordingly. The advanced technique of web mining, which collects globally distributed content and knowledge from the web, refreshes and structures it continuously, and tracks its usage would greatly assist this process. Development of web community of human learners who can further act as pedagogical agents can lead to the elevation of whole self-learning process to new heights<sup>19</sup>. The library professional can handle most of the web intelligence-based e-learning management activities.

The field of education can easily adopt the concept of self-service for imparting both education and training.

The e-learning strengthened with adequate library facility emerges as most attractive option in this regard. The education planners in India should suitably design it for implementation at various levels and ensure its smooth implementation across the country.

## 8. CONCLUSION

Education and training, which was traditionally bound to the classrooms, cannot be expanded beyond a point. Moreover, it depended on exchanges using spoken words. The efficiency of that interaction mode suffers on many accounts like availability of physical space; time-bound delivery, and attentiveness of the recipients. The fast growing e-learning method overcomes many of these limitations. For example, the material exchanged through computer and communications technologies remains available for prolonged discussion and facilitate one-to-one or even many-to-many interactions for any desired length of time. The feature of asynchronous communication underlying e-learning helps one to learn and react at one's own pace and time. Besides employing the e-learning process to share the quality teaching and other scarce resources, it can be innovatively used for several other purposes. For instance, it can be adopted for training the agriculture extension workers, semi-health professionals, and even in the much required correction process for the jail inmates.

Designing suitable action programmes to advance e-learning as a self-service or self-help measure should receive attention. Addressing the issue of digital divide by investing in necessary computer and networking technology, minimising the implementation time and providing training to use the technology tools is therefore necessary. Like the digital divide, English language fluency divide is to be tackled because most of the current computer technology and course contents require command over English. Development of multilingual contents and tutorial like courses would be helpful in that direction. Integration of several e-learning tools is another emerging need. Promoting e-learning to fight skill obsolescence would certainly help persons in all the fields to remain relevant in the fast changing job market, and to meet the professional demands. The impacts of e-learning would happen in variety of ways. It is necessary to filter out the harmful ones and initiate actions that promote the beneficial ones. Periodic studies about assessing the impacts on different stakeholders in the framework of McLuhan's laws of media are therefore recommended. The library has always played a very important role in supporting education for both masses and classes. Its transformation to provide digital document-based services, to establish institutional repository of knowledge, and to act as a facilitator for inculcating information literacy should get a due priority. Realisation of the full potential of

e-learning does not seem possible without such advanced library back-up. The library should therefore clearly define its goals and guiding principles for participating in the distance education programmes of its parent body.

In particular, a virtual reference service by libraries to assist the remotely located students or faculty in identifying pertinent resources, accessing relevant databases and providing suitably packaged supplementary course material would go a long way in strengthening and value adding to the e-learning process. Fortunately the technological tools driving the e-learning process are the same that are used in the modern library operations. The library professional should work on this advantage further to play an active part in the conduct of e-learning at different levels. Lucrative career prospects are thus expected for a library professional in this area like that of online learning designer and knowledge packager. By participating in the e-learning process a librarian would be serving the cause of education, training, research, and scholarship in the new society too.

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