E-Education in India: Pace of Learning on a Hi-Tech Path

Shiva Kanaujia N R Satyanarayana

Abstract

Information technology opens up the whole world of knowledge and allows teaching and learning to take place beyond the traditional boundaries and resources of the school. The paper discusses e-education in India. Though information technology is at its great speed still some steps and efforts needed at various levels for providing e-education. The global scenario shows the invading role of information and communication technologies into education sector so it is necessary to adopt technologies for education in India also. The paper pictures a model for e-education and highlights Tools for e-education: Faculty: environment, creating space for learning and Basic grounds for initiating e-education. Also mentions advantages of e-education. Various aspects of e-education in schools and universities are discussed. Paper concludes with the golden idea of e-education.

Key words : E-education, Devices, Global connectivity, Technology aid, Tools for E-education.

0. Introduction

In the last decade, we have experienced rapid advances in information technology which have created unprecedented changes in the way we live, work and play. The growth of the Internet, e-commerce and telecommunications has created tremendous opportunities and challenges for both societies and economies. Information Technology (IT) is also having a profound effect on education. IT is one of the most powerful enablers, which facilitates learning and administration. The landscape of our schools today is vastly different from that which we were familiar with during our own schooldays. Visit any school and you will see students accessing the Internet from PCs along the corridors, in the classrooms and the library. Art lessons are conducted with digital software rather than paint and brush.

IT has opened up the world of education. It provides new tools for teachers and the students. And it opens up the whole world of knowledge and allows teaching and learning to take place beyond the traditional boundaries and resources of the school.

The Internet can provide inquiry-based learning where the most proficient people in the field answer questions. It also allows enormous scope for discussions and exchange of views, facilitating multi-disciplinary research, and collaboration across different fields, and between researchers and students across geographical boundaries.

To compete effectively in such an environment, Indian firms and the economy as a whole must stay nimble and be receptive and responsive to changes and trends in the external environment. E-education provides a good opportunity for Indians to prepare themselves for the challenges they will face in the new economy. Through online learning, we can familiarize ourselves with new technologies at Internet speed; speed up the process of sharing new ideas and adapt to the culture and spirit of the global economy.

1. Steps and Efforts Needed at Various Levels

We must organize e-education and develop projects in such a manner that with the proposed introduction of e-education, there must not happen any problem for the students in the rural belt to get in touch with the teachers even after the office hours.

The teachers, should stay in the select schools after the working hours would clear the doubts of the students online. The students through the Internet kiosks can also be able to get access to education oriented web sites under various projects.

The projects would help the students get acquainted with Internet, e-mail and operation of the computers in general.

Efforts must be made to provide computers in villages where Internet kiosks can function. Studies should be conducted on the impact of the project outside the schools. Wireless Local Loop (WLL) based cordless digitally enhanced telephony concept can be introduced in other villages. Some self-help groups can also be developed for setting up Internet kiosks.

1.1 Developing Devices

We can develop devices that can be useful in order to create interest and awareness for e-education. A computer device, Simputer, was developed in year 2001. It, aims to bridge the digital divide, was put to a severe test during the first phase of the pilot project last year in areas of e-governance such as computerization of land and health records in the IT capital of Bangalore [1].

1.2 Initiatives due to global connectivity

Increasing global connectivity is opening up new possibilities for delivering education over networks. Various countries have started providing educational content on the web. We can take example of Canada and U. K. [2,3,4]. Due to coming down costs of global connectivity, Virtual university initiatives will become increasingly important. Various virtual universities are; Monterry, Mexico [5]; Western Governor's initiatives [6]; African Virtual University [7]; Massachusetts Institute of Technology [8] and NIIT net Varsity [9].

In our country, Pratham [10], eGurukool [11], Zee interactive [12] and Schoolnet [13] can be mentioned as example for projects and initiatives going on. According to the Initiatives of NASSCOM to get underway in 2003, e-education to be spurred with quality [14].

1.3 Technology Aid

There are primarily three ways in which technology aid the process of education and learning:

a. Accesses to information - Thousand of pages of information are available on almost every topic on the World Wide Web.
b. Computing power - A range of simulations and personalized tools can be created to aid the learning process of students.
c. Connectivity – Connectivity to experts and peers around the globe, helping the student in problem solving and building exposure and perspective.

So, the benefit can be very real and direct. Apart from the availability of relevant tools and applications, the two key aspects for wide-spread use are the availability of computers and internet and student's acceptance of this medium. In both these areas, India is pretty much growing fast.

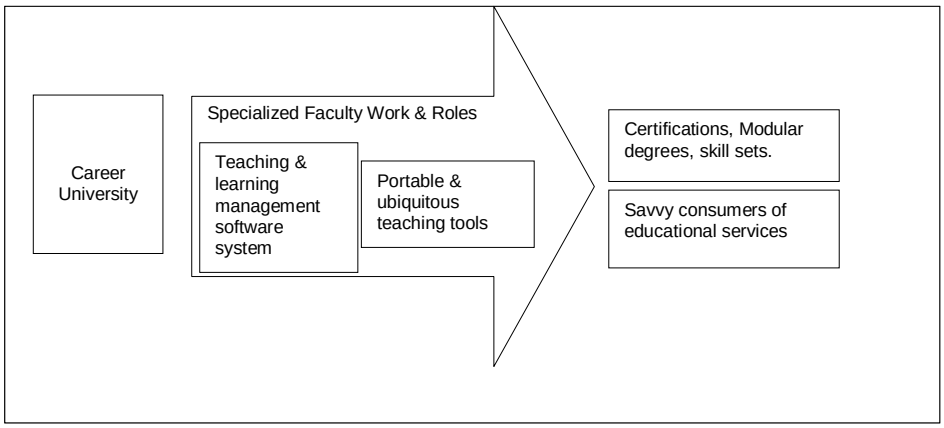
Computers and the Internet, connected via VSATs, fibre optic cables, WILL, or copper telephone lines make it possible to deliver text, speech and even video to remote areas; costs of such infrastructure can vary from as little as Rs 50,000 per terminal to as much as Rs 200,000 currently, depending on what last mile technology is used. Yet, developments in fibre optics, falling PC prices, and the imminent price war for bandwidth signal an environment in which per terminal prices could drop to as little as Rs 25,000. There is broad agreement that use of computers enhances the quality of education in schools and colleges. Fortunately, the declining price of PCs and networking devices makes it economically feasible for countries such as India to use IT to deliver quality education to previously un-reached populations and to enhance the quality of education in existing teaching institutions. IT enabled education and IT enabled distance education will become commonplace in the future.

1.4 Technology Acquisition

E-education can not be provided without proper technology acquisition. Technology acquisition includes following techniques and practices:

- Hypermedia: Interlinking of diverse subject matter; easier conceptual exploration; multiple simultaneous representations for learning.
- Cognitive audit trails : Support for finding patterns of sub-optimal performance.
- Computer-supported cooperative work : Facilitation of team task performance.
- Intelligent tutors and coaches for restricted domains : Models of embedded expertise for greater individualization.
- Optical-disc systems with multiple read/write and mixed media capabilities : Support of large databases; cheap secondary storage; shared distributed virtual environments.
- Standardization of computer and telecommunications protocols : Easy connectivity, compatibility; lower costs.
- User-specific, limited vocabulary voice recognition : Restricted natural language input.
- High-quality voice synthesis : Auditor natural language output.
- Sophisticated authoring and user interface management systems : Easier development of applications; reduced time for novices to master a program.
- Widespread, high-bandwidth, fiber optic networks : Massive real-time data exchange.
- Fusion of computers, telecommunications : Easy interconnection; universal "information appliances".
- Information "utilities" : Access to integrated sources of data and tools for assimilation.
- Microworlds : Experience in applying theoretical information in practical situations
- Semi-intelligent computational agents embedded in applications : Support for user-defined independent actions
- Advanced manipulatory input devices : Mimetic learning that builds on real-world experience.
- Artificial realities : Intensely motivating simulation and virtual experience.
- "Information appliance" performance equivalent to current supercomputers : Sufficient power for simultaneous advanced functionalities.
- Consciousness sensors : Monitoring of mood, state of mind.
- Artifacts with embedded semi-intelligence and wireless interconnections : Inclusion of smart devices in real-world settings.

2. A Model for E-Education



E-Education System

2.1 Tools for e-education

- Teaching and learning management software systems can be linked to their back office administrative systems
- Web course management tool
- Student tracking and collaboration tools
- An entire suite of learning aids, personal bots will emerge
- Personal digital assistants
- Summarizers, finders, connectors, learners
- The wide gulf between students and practitioners will be narrowed by education coming to the desktop and practicing experts made available for testimonials, examples, actual observation of behavior through broadband methods

2.2 Faculty

- Highly more specialized researchers and content developers will complement each other
- Subsidy for research through blind funding of faculty salaries will become more difficult once legislators realize that much of the delivery will come form elsewhere

2.3 Environment

- Tools for teaching and learning will become as portable and ubiquitous as papers and books are today
- Teaching and learning anywhere any time
- A larger percentage of content will age rapidly
- Alternate models for paying for education will evolve with less of government subsidies and more on the desk training paid by employers

- Students will be savvy consumers with substantive amount of choice
- Increased level of student activism
- Degrees may be obtained with a much increased level of institutional mix (courses from multiple universities)
- Learning is moving off campus: to the home, the workplace, the field, or wherever the learner is
- Students will pick up and piece together certifications, skill sets, and knowledge sets

2.4 Creating a space for learning

1. Designing strategies to introduce learners to each other.
2. Using effective teaching strategies.
3. Gaining agreement with the learners about rules, norms, and procedures for discussion.
4. Using a free flowing and interactive content and structure.
5. Encouraging students to evaluate information.
6. Encouraging students to analyze information.
7. Encouraging students to connect information.

2.5 Basic grounds for initiating e-education

1. Exploring the vital role of different information technologies (print, audio, visual and digital) in the development of human and knowledge capital;
2. Sharing policies, strategies, experiences and tools in harnessing technologies for knowledge dissemination, effective learning and efficient education services;
3. Reviewing the latest systems and products of technologies of today, and peek into the world of tomorrow; and
4. Exchanging information about resources, knowledge networks and centers of expertise.

3. Advantages of E-Education

E-education has following advantages

1. Student learning is self paced and interactive.
2. Educators can experiment in creative ways using unique and intriguing web sites.
3. Remote delivery of cost-efficient and conveniently distributed “virtual courses”.
4. Networked learning gives not only education but also fun as students browse Internet in teams or on their own.
5. Better performance and evaluation can result.
6. Adopting new learning technologies in courses and curricula.
7. One can become a part of worldwide movement of researchers.
8. Better funding resources for technology research.
9. New technology leads to more cross-discipline research and applications.
10. Avoidance of obsolescence teaching.
11. Learning can be more contextual as one can create interactive and animated hypermedia graphics and simulations that bring students closer to realities and experiences.

4. E-Education in Schools

Computer education facilities should be set up in rural areas by identifying secondary schools in development blocks in the country. All schools with computer education facilities should have Internet connectivity so that vast educational resources already available and to be developed by schools themselves could be shared amongst them.

At different level, government is making efforts to provide e-education. The Melur Taluk in Madurai district would probably be the first one in the country where e-education would take off soon in seven schools through the project "Sustained Access to Rural India". [15]. Another story published shows the interest of children in e-education. The kids have taken to computers easily. They want these classes to go on and on," says a teacher. Some children walk barefoot up to 15 km for their share of interactive learning. [16]. According to M. Sasikumar, eLearning is still lagging behind in India. It needs to pick up, if education needs to have far reaching implications at the macro level in the country. In India, the problem is that eEducation and 'virtual university' has been restricted to things like video conferencing [17].

4.1 Gyandoot

The Gyandoot Samiti, with the help from Member of Parliament, has established 34 kiosks at the high schools and higher secondary schools [18].

Career guidance:

- Pathyakram
- Chhithi
- General Awareness
- Prerak Prasang
- Jiwaniya
- Sawaliram se poochiye

Recently government launched a computerization programme 'Vidya Vahini' proposing to connect 60,000 government–funded senior secondary schools through Internet and Intranet. The programme would provide the schools with computer labs to facilitate IT education, access to Internet, online library, academic services, web broadcast and e-learning. [19].

A software named "Bharatvidya" was developed, which is an NCERT curriculum specific, multimedia based, computer-aided teaching software. It will be helpful in explaining any concept with visual effects into classrooms. The software is equipped with pictorial representations of the academic curriculum of NCERT, which is covering subjects like Science, Social Studies and Mathematics for classes V-IX. It is running in almost 84 schools in 36 cities across the country [20]. In Uttar Pradesh, e-learning was intended to start and it was funded by central govt. technology based learning process was made possible through the Education through Internet (ERNET) facility. For this project principal and five teachers per schools have been trained [21]. The government will spend Rs 12,000 crore in next four years on e-governance and to take e-learning to schools in every district across the country. The government will launch a pilot project to take e-learning to 20 schools in the country spread over seven districts [22]. According to a report, India's Internet subscriber base stood at 35 lakh on March 2003, up from 32.39 lakh in the year-ago period. It was only 2.3 lakh in March 1993. It is a good sign as far as Internet boom in the country is concerned adds the IT experts in New Delhi [23].

IBM expects the market growth for speech and language technology from $1.4 billion in 2000 to nearly $3 billion by 2005. The IBM plans to develop it not only for Hindi but also for other Indian languages also [24].

The Royal Dutch Shell Group of companies, the second largest energy conglomerate in the world, has firmed up plans to enter the Indian education sector in a big way. The company proposes to invest approximately Rs 87.5 crore ($18 million) as part of the diversification of its Indian operations in this segment. The company has applied to the Foreign Investment Promotion Board for permission to undertake Internet-based training activities for primary school students in the country through the subsidiary route. The company proposes to be engaged in the development, marketing and delivery of an integrated Internet-based e-learning solution, which will include content, tools and equipment, catering to primary schools. [25]. Another group, LearningMate, a division of education technology and e-learning company, Educomp Datamatics, has forged a strategic partnership with Blackboard Inc., the leading global software infrastructure company for e-education. Under the agreement, Educomp will distribute Blackboard e-education solutions in India [26].

5. At University Level

Information sharing is critical to the process of raising educational standards, and if universities are interconnected through IT enabled networks, they will be able to share information more easily and thus raise standards rapidly. We see this happening elsewhere in the world, and efforts are underway to replicate this in India as well. University education too requires boosters.

The online higher education market may become so segmented that specialty courses rarely available on any campus will spring forth from virtual universities. For example, an online course in a particular discipline may emerge even though the course is not available on any campus. There may be no students interested in such a course on a given campus, but among all persons in the world, there may be enough students wanting this course to justify its being offered online in a virtual university.

The comparative advantage of having a full-line of opportunities for students to choose majors in humanities, science, engineering, business, education, etc. will fade as students will mix and match online courses and degree programs in a variety of institutions.

E-education requires specialized and creative learning materials apart from materials that are suited for onsite courses. E-education improves with clever hypertext and hypermedia materials. E-education may get poor results due to the poor materials. Performance outcomes might be greatly improved with improved online materials specially designed for the instructors and the students in an e-education course.

The biggest problem of evaluating the impacts of technologies on learning is that the technologies themselves are changing a breathless pace. A technology that failed last semester may be replaced by a new technology that succeeds this semester. This makes it difficult from experiments conducted on obsolete or greatly inferior technology or course content that has been revised for newer technologies. Various programs to let the students involved in innovative projects, providing them opportunity to log on to online class room, interaction with the students of other countries and making programs which provide resources not only for students but also for educators can be helpful.

Assessment also plays a big role in online universities. In a system modeled after the university's highly successful classroom offerings, students are grouped together in courses throughout an entire degree program, and they are given batteries of exams both before and after the program. The tests enable the university to measure exactly how much the students have learned, and to evaluate the courses. Indeed,

assessment is taking center stage as online educators' experiment with new ways of teaching and proving that they're teaching effectively. Online education is only one of several influences putting pressure on traditional education to do more to assess the quality of courses.

Policy guidelines to use IT for education are now in place. Myriad initiatives to experiment with e-education are also underway. What remains to be done is to develop an appropriate mix of technologies and teaching methodologies for IT enabled education, and to find the funding for mass implementation.

6. Some Points for Consideration

Though various efforts are being made to initiate and propagate e-education but some points are still to be faced:

- What are the possibilities for enhancing the quality of education using distance-learning methodologies?
- What is the cost effectiveness of using ICT in education in the context of developing countries?
- What are the different approaches for funding e-education?
- What are the changes needed in pedagogy for preparing the next generation for the information age?

7. Conclusion

E-education is not entirely new concepts but has grown as the WWW has developed in each country. E-education is taking roots for Indian students as well. But first, it is important to understand exactly what we mean by e-education and quite simply it is education and training delivered and accessed via the Internet. One of the major advantages of e-education is that one can access the best education in the world direct from the persons who wrote the courses for online study. The courses may range from technical, medical, academic to general interest subjects and the levels can be from beginner to higher advances. With over 800 courses to choose from, the individual should find the right course and level without difficulty. In the 21st Century, students may stay at home and take distance education (synchronous and asynchronous) in their homes across the world. Geographic comparative advantage will shrink and shrink and shrink. More importantly, excellent students who could not be accepted as onsite students in prestige universities (due to lack of financing and constraints as to how many can fit into onsite classrooms) face new opportunities to get a prestige degree in their own homes.

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About Authors

Ms Shiva Kanaujia is Research Scholar (JRF) in DLIS, University of Lucknow, Lucknow, India and holds B.Sc., M. L. I. Sc., A.D.I.T. She has published papers.She is life member of OITS, SIS, ILA, IASLIC, MANLIBNET and UPLA.
E-mail : shivadali@rediffmail.com

Dr. N.R. Satyanarayana is Professor and Head of the Department of Library and Information Science, Lucknow University, Lucknow. He secured degrees from Universities of Osmania, Banaras, Lucknow and College of Librarianship Wales, U.K. He has edited a good number of Books, published articles in professional journals and national and international conferences and was Editor for the journal "Lucknow Librarian". He is an active member of many professional societies and held many responsible positions in UPLA, IASLIC etc.