ICT for Success of Education from an Indian Perspective

Rakesh Mohan Bhatt

Dept. of Computer Science, HNB Garhwal University, Srinagar (Garhwal) 247 174
India; rmbhatt77@yahoo.com

Abstract: India has been trying to uphold the status of education for many years. However, due to poor educational infrastructure, social segregation, and non-conducive economic conditions, maximum learners are deprived of education. India has a large number of students from primary to higher levels. Only around 40 percent can improve to gain their higher studies after completing their primary or middle level education. Due to the convergence, electronic-informational environment has been emerging at a very fast rate. Now, the education system seems to follow its use in delivering and managing the education in a need-based way. There is an up surge of computer and Internet connections in schools. Almost every university will be creating its own network and will be under a single net in the coming future. Certainly, these efforts will make the education in a cost-effective manner. Further, creation of the collaborative teaching and learning environment is essential so that the dropout rate remains low and the requirement of increasing number of learners and teaching load can reach a resolution by ICT means. The present paper discusses the education scenario, the upcoming efforts in the ICT developments and need of the collaborative environment for success of education in India.

Keywords: ICT, Education, India

1 Introduction

Indian has twenty-eight states and seven Union Territories (UTs) that cover a population of 1.065 billion. The total literacy rate has increased to 65.8 percent. India has the second largest elementary education system in the world, having an intake around 1.5 million children of the age group 6-14. There are 324 universities, 16,000 colleges for higher education enrolling about 9.28 million people. Thus, India has a large number of students from primary to higher levels (www.education.nic.in). However, conditions deprive maximum learners of an

education. After completing the primary or middle level education, around 40 percent learners fail to seek a higher education.

The applications of amalgamation of ICTs will have far-reaching implications in shaping the society. Due to this convergence, electronic-informational environments are emerging at a very fast rate. The education system seems to follow its use in delivering and managing the education in a need-based way. Further, excellent efforts are in progress in telecommunication services for creating and accelerating the open and collaborative learning environment. Thus, a new educational scenario is emerging by applying and executing ICT services. Hence, the definitions of formal and non-formal education systems are somewhat being diluted, and existence of an ICT-based education services are emerging. To elevate its status by analyzing some points, viz. education scenario, emerging ICT efforts, challenges and outcomes, respective issues emerged and discussions and conclusions have been made, as we will see in the following sections.

2 Education Scenario

If we look into the history, the growth of enrollment in primary, upper primary, secondary, and senior secondary levels have occurred 6, 14, and 20 times during the years 1950-1951 to 2001-2002. An increase of 24 and 12 times in the number in the higher education institutions providing general and professional education, respectively, were recorded and ten times the number in universities has been observed during this period. The government spends approximately 4% of the GNP on education whereas as per the recommendation of National Policy on Education, the aim is to achieve 6%, which seems very far. Several efforts in the past have been recorded (Bhatt 1998, 2006) but still more efforts are required.

India has around 50% of its population below the age of 25, of which 25% are children. A large number of the children fail to complete their primary level of education. This dropout rate falls in the range of 50-60 percent of the total intake. According to the report of the World Bank, about 60.7 million children of age group 6 to 10 years have joined the schools whereas 30.2 million could not obtain the opportunity. Further, for higher education, only 6% (Deshmukh 1999) falling in the age group of 17-24 years was able to enroll. If we analyze the development in the literacy improvements, we find that India had 18.33 percent literacy rate at the time of Independence in 1947; which has now been increased to 65.8 percent. Nevertheless, India still has one-third strength of the non-literate of the world's illiterate mass. This ratio is very high and estimates the figure around 400 million. If we observe globally, we examine that since 1960, students numbers have increased by 6.5 times until 1995 (Gautam, 1999). Now about 16,000 colleges (1849 for women) have the enrolment of 9.28 million and the faculty strength is

around 0.436 million.

The plan to pool the learners' stream right from the beginning, i.e., from the primary school level, the scheme should be very well thought and analyzed to take the benefits of ICT services. The chain of dropouts from primary to higher level can be very well controlled and checked. During the year 1998 (www.education.nic.in), the strength of children in the primary schools was 106 million, and only 39 million students were studying in the middle standard and 23 million at the secondary followed by 6.5 million at the tertiary level. As per the Institute of Applied Manpower Research (IAMR), New Delhi, until 1997 India had approximately 0.6 million primary schools, 0.15 million middle schools and 0.1 million high/higher secondary schools. We also observe that the dropout rate is very high at the primary level.

To alleviate the increasing dropout rate, students should have to be positively motivated. By providing the better options available with the ICT aided services, the country can also develop and maintain this affinity. However, if the commitment to fulfill the objectives set for the education systems comes from the learners as well as from the education providers, then success is achievable. This socially and vocationally relevant new mode of learning should enable education to keep high the literacy rate and simultaneously keep the rate of dropouts. We observe that under the influence of ICT, distance education has been taking a considerable lead. Only 12% (Kishore, 1998) of the learners were being catered to at the higher education level through distance education providers; nonetheless, with the ICT enabled services, the number of learners is increasing. This mode of learning can also be covered under the net-based learning (Sj0helle, 2005) in addition to the conventional system.

3 Emerging ICT Efforts

ICT has imparted strength to all organizations. Thus, innovation through ICT has occurred and taken for the developmental works as a necessary tool (Talera et.al., 1995). Therefore, developmental issues, which are difficult to analyze and understand particularly in India where diversity exists in many forms, ICT can help significantly, taking into account the fact that ICT itself does forward the solutions. Under the pressure of growing population and increasing demand for ICT enabled information in India, it is required to look for the new generation of technologies that deliver information to a host of potential users including researchers, educators, business groups, and policy makers.

Until 1999, India had 75 million televisions in households with an estimated 362 million TV viewers. Further, estimates report that only 7.1% of the population has a telephone, 2.4% has a mobile, 0.72% has the PC, and only 1.75% of the population has an internet connection (Vikas, 2004). Some years back personal computer market has shown the growth of 70% (Chandragupta, 2000) which is ever increasing since then. By March 2000, internet connection holders were only

at 1.2 million; this has now reached around 10 million. Some years back, India had 3.6 PCs per 1000 people as compared to 362 in the US. To increase this ratio, IT task force of the Government of India (Sesagiri, 2000) has envisaged raising this ratio to 1 PC per 50 people by the year 2008. India's IT spending is about 0.7 per cent of GDP.

Under the operation knowledge (www.nic.in), the government's IT Action Plan envisages - IT for all by 2008. In this connection, the government launched to have an internet facility in all educational institutions in all states. The government also has programs on the anvil to create SMART schools and virtual institutions. More than 1000 pilot projects are under operation by the government for spreading IT among the masses. It has spent about $14.55 billion in these projects. They estimate the success rate at 40%. The initiatives under these projects are like the Vidya Vahini project for providing connectivity to Government Senior Secondary Schools and the Gyan Vahini project to upgrade the IT infrastructure in the higher learning institutions by 2007. Many other initiatives have also been taken such as the Working Group on IT for masses (www.itformasses.nic.in); upgrading the Education and Research Network (ERNET) which connects various universities and regional engineering colleges (RECs) through a high speed network; enactment of the Information Technology (IT) Act of 2000; the Media Lab Asia project for taking IT to the masses. With these efforts, the internet subscriber base is expected to increase to 35 million by 2007 from the earlier level of seven million. It also envisions generating seven million jobs in the sector by 2008. The Department of IT has also instituted a computer literacy excellence award for schools (www.bhashaindia.com/trivia/trivia.aspx). Other initiatives such as Gyan Nidhi (www.cdacindia.com), Vidhya Nidhi (www.vidhyanidhi.org.in), and the Indian National Digital Library in Engineering Science and Technology consortium (INDEST) have emerged and they are gaining popularity among the masses.

Further, to strengthen the mission to disseminate the education, the government launched EDUSAT, an Indian educational satellite, in the year 2004. This provides audio and video communication facilities. In this effort, 58 institutions have access to SITs by the ISRO and UGC to cover 17 regional centres, 12 academic staff colleges, and about 28 universities. This network will be expanding its services in near future (Sharma, 2005). Very recently, to increase the enrollment in the higher education using ICT, the planning commission for the production of knowledgeware and the creation of new infrastructures had allocated more than 100 billion dollars to this endeavor. Efforts are also taking place from the Consortium for Educational Communication (CEC) for the distribution of Vyas Higher Education Channel (Kem, 2008) to enhance the reach of the educational communication at the most remote locations. To deliver the knowledge, courseware on higher education using ICT modes, UGC-CEC has 17

Educational Multimedia Research Centres (EMRCs) located in the different parts of the country. Currently, it covers around 50 areas of interest with the help of its 15,000 repository of programs (www.cec-uge.org).

Recently, the University Grants Commission has decided to establish "A UGC Network" named as UGCNET to provide a seamless, broadband, scalable nation wide inter university link up and create virtual enhancement of the academic structure. University level UGCNET has also begun to cover all universities under an umbrella. To date about 183 universities are covered under this net.

4 Outcome

According to the World Education Report-1998, India had around 45.88% of the world illiterates of the age group of 15+. However, the literacy graph has shown an upward progress of about 11% from the 1991census to 1998 census. In a significant move, three years back, the government had passed the Act 2002, enacted in Dec 2002 that has made free and compulsory education as a fundamental right of all children in the age group 6-14. This step will eventually increase the demand for higher education too. Thus, the tenth five-year plan from the year 2002 to 2007 has recommended about one million teachers for classes 1 through 8. An enhancement of 6% to 10% enrolment in the universities is also expected by the year 2007.

The project "Education for All" has fostered this requirement. Recently, the Data Quest magazine reported that the share of IT area is about 7%. During last year, the country sold about 4 million PCs. The broadband facility started in India in 2000; however, its wide use is still awaited although the users have now started accessing the internet using wireless technology but in small numbers.

To modernize the facilities, extra financial support is required to meet the ever-increasing pressure of new entrants. The ICT role can reduce the burden in many ways at all levels such as with extra working hours, extra teachers, and extra buildings. Learners on computers can involve themselves in a competitive environment, besides gaining pace individually in the learning process. Through network, they can become a team member, and this can benefit a lot in many ways. Thus, asynchronous as well as synchronous mode of learning is achievable.

In the process of controlling and operating the ICT based education process, the evolved collaborative environment may help tackle the issues as:
- Course design and implementation,
- Admission procedure,
- Teaching facilities
- Teaching requirement,
- Establishing learners or target groups,
- Staff members,

- Requirement for relevant hardware and software etc.,
- Area-specific need based education,
- Re-engineering the education process, and
- Other measures to revamp the education system.

The virtual role of ICT has increasingly been becoming the changing factor of the new scenario of education mode, which is now e-learning. Under this mode, a learner gets to pace themselves on his/her own, irrespective of the activities of other learners and simultaneously they can place themselves on the right direction. Further, changes are occurring so fast in the IT industry that it is very difficult to cope with the pace. Therefore, it also becomes important to anticipate these changes accordingly in such a way as to achieve the aims.

5 Challenges

Technological revolution in information science and ever growing demands have propelled the need to have the proper and secure management of emerging massive information, by deploying appropriate communication devices that the required information may be delivered in time and space.

We can consider three tasks associated with the challenge. Heavy investment will be required to procure these items; this is the first task to meet the challenge in meeting the objectives set for education. Then, the second task is to acquire the required ICT infrastructure and applications. The third, and the most important, task is to create the collaborative environment. This third task is the cumulative stage of the progress on the first tow tasks. For the first case, the government is generating the necessary funds; and, for the second case, educational institutions are running several projects and making MoUs with the industries to procure the ICT infrastructure. The third task will facilitate the synchronous as well as asynchronous mode of teaching and learning processes. A collaborative environment means working together in harmony. This harmony consists of X and Y parameters such that:

X is considered as a collaboration in team teaching, and
Y is considered as a collaboration in team learning.

This pair builds up a sense of responsibility, which we can term "shared-responsibility". This is the very important aspect of the collaborative environment. This shared-responsibility allows individual and group learners to improve their skill in depth. We can tremendously increase the level of inspiration. In ensuring the good performance of X and Y parameters; Y will require the learner to stay in his group and interact accordingly; whereas, X will require to inculcate the means of assistance, to notice, and examine/check each learner, in order to observe the

progress and evaluation. This kind of environment can support the web-based remotely controlled lectures, and student's lab computers (Curran, 2002).

6 Discussion

In addition, a large numbers of government, public, and private companies have their own enterprise-wide networks. As far as Internet economy is concerned, it is reported (Ahmad 2001) that $22 billion is floating in the internet economy of India and 184 companies has invested in this economy since 2001. In the IT segment, 41 percent of the companies have invested.

In the outsourcing business, 2% is due to IT. Among top 230 out of 1000, world companies are in the outsourcing business, which might be due to presence of existing work force and infrastructure. Outsourcing business has yielded 40% annual increase and estimated 17 billion by 2008, which was 1.5 billion during 2001-02. In the ITES sector, the National Association of Computer Manufacturers (NASSCOM) has also estimated a growth of about $ 24 billion by 2008 (Singh, 2004).

Therefore, here, ICT based education can fill the gap between the industry and education. However, side-by-side updating and orientation in the education are needed as per the industry practices and techniques. An exploding crunch of skilled or professionals is expected in the industries. For example, in the field of IT, a crunch 500,000 employees by 2010 is pegged by the NASSCOM. Towards this realization, NASSCOM and UGC have recently made a tie-up to accelerate the industry-academia interface (Agrawal, 2005) so they can share current tools, practices, and knowledge. These developments will strengthen the teaching/learning system and the ICT infrastructure.

7 Conclusion

Information Communication Technologies (ICT) has been adjudged the best tool to offer its services in a number of ways particularly for education. In the view of increased population and poor educational infrastructure, the current emerging digital scenario can pave the way for better means of education in India. We have noticed significant observations in the integration of the existing technological infrastructure, which will certainly allow the smooth delivery of the ICT services to education.

The creation of the collaborative teaching and learning environment is essential so that the dropout rate can be kept low and the requirement of increasing number of learners and teaching load can also be resolved by ICT means. Further,

developments towards to create the industry and academia interface will strengthen the teaching/learning system and ICT infrastructure. This will also enhance the employable stature of the learner. Therefore, to make out education success, we need ICT applications to widen its scope especially in the rural areas where the majority of the target groups reside. Only then will it fulfill the expectation of a substantially raising in enrolment of the learners by effective deployment of the education channel and the creation of the collaborative learning environment.

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