Enhancing the Quality of Higher Education through the use of Information and Communication Technology.

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Abstract

Basic change in the economic and social qualities brings in radical transformation in the skills, capabilities and the attitude of the masses. Thus current education system calls for a shift in its delivery and pedagogy. What this paper brings forth is to promote integration of Information and Communication technologies (ICT) in higher education for imparting easily accessible, affordable and quality higher education leading to the economic upliftment of India. One distinguishing feature of ICT is that it increases the flexibility of delivery education so that the learner can access knowledge globally and in no time. It also brings in a new dimension methodology of teaching and the manner of learning as the process is learner oriented and learner driven. The teacher remain as mere facilitator what it does in the whole scenario is it prepares the learners for the real world in a practical way and also contributes to the growth of the industry. It provides impetus to the economy by improving the quality of learning. Besides there are several tangible and intangible benefits for the beneficiaries involved in the growth of the economy. Information and Communication Technologies can foster better teaching learning situation as it can share the wider availability of best practices and best course material in education. It gives freedom to academic institution to reach a large audience. It can reach the disadvantaged groups and new international markets too. This in turn will lead to the democratization of education and in countries like India it can close in the gap that is there due to digital divide. The paper also looks into the factors related to policy, planning, technical requirements as well as the training required for the stakeholders for the successful implementation of the education system. These would further ensure the accountability, quality assurance and accreditation. It will also ensure that consumer protection in ICT based education is taken care of.

Key Words: Knowledge Economy, Accreditation, ICT
Introduction:

India, like any other knowledge economy, depends on the development of its educational sector. Higher education drives the competitiveness and employment generation in India. However, research findings have shown that the overall state of higher education is dismal in the country. There is a severe constraint on the availability of skilled labor. There exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education (Bhattacharya and Sharma, 2007). Innovative use of Information and Communication Technology can potentially solve this problem. Education is the driving force of economic and social development in any country. Considering this, it is necessary to find ways to make education of good quality, accessible and affordable to all, using the latest technology available. The last two decades have witnessed a revolution caused by the rapid development of Information and Communication Technology (ICT). ICT has changed the dynamics of various industries as well as influenced the way people interact and work in the society. Internet usage in home and workplace has grown exponentially. ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers. India has a billion-plus population and a high proportion of the young and hence it has a large formal education system. The demand for education in developing countries like India has skyrocketed as education is still regarded as an important bridge of social, economic and political mobility.

The challenges before the education system in India can be said to be of the following nature:

Access to education- There exist infrastructure, socio-economic, linguistic and physical barriers in India for people who wish to access education (Bhattacharya and Sharma, 2009).

Quality of education- This includes infrastructure, teacher and the processes quality.
Resources allocated- Central and State Governments reserve about 3.5% of GDP for education as compared to the 6% that has been aimed.

There exist drawbacks in general education in India as well as all over the world like lack of learning materials, teachers, remoteness of education facilities, high dropout rate etc.

Participation of Indian students in education.

<table>
<thead>
<tr>
<th>Stage of education</th>
<th>Gross Enrolment Ratios (2008-09)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>87%</td>
</tr>
<tr>
<td>Secondary</td>
<td>41%</td>
</tr>
<tr>
<td>Tertiary stages of education</td>
<td>10%</td>
</tr>
</tbody>
</table>

(Source: Department of Higher Education, 2010)

Thus, the participation rates of the Indian population in education, and especially in higher education are quite low.

In the current Information society, there is an emergence of lifelong learners as the shelf life of knowledge and information decreases. People have to access knowledge via ICT to keep pace with the latest developments. In such a scenario, education, which always plays a critical role in any economic and social growth of a country, becomes even more important. Education not only increases the productive skills of the individual but also his earning power. It gives him a sense of well being as well as capacity to absorb new ideas, increases his social interaction, gives access to improved health and provides several more intangible benefits. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs etc have been used in education for different purposes.

The four main rationales for introducing ICT in education:
Rationale Basis

Social Perceived role that technology now plays in society and the need for familiarizing students with technology.

Vocational Preparing students for jobs that require skills in technology.

Catalytic Utility of technology to improve performance and effectiveness in teaching, management and many other social activities.

Pedagogical To utilize technology in enhancing learning, flexibility and efficiency in curriculum delivery.

Today ICTs—including laptops wirelessly connected to the Internet, personal digital assistants, low cost video cameras, and cell phones have become affordable, accessible and integrated in large sections of the society throughout the world. It can restructure organizations, promote collaboration, increase democratic participation of citizens, improve the transparency and responsiveness of governmental agencies, make education and health care more widely available, foster cultural creativity, and enhance the development in social integration. It is only through education and the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change.

**ICT can be used as a tool in the process of education in the following ways:**

- **Informative tool**: It provides vast amount of data in various formats such as audio, video, documents.
- **Situating tool**: It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
- **Constructive tool**: To manipulate the data and generate analysis.
- **Communicative tool**: It can be used to remove communication barriers such as that of space and time.
ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time. Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work.

Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems. It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy.

**e-learning has the following advantages:**

- Eliminating time barriers in education for learners as well as teachers.
- Eliminating geographical barriers as learners can log on from any place.
- Asynchronous interaction is made possible leading to thoughtful and creative interaction
- Enhanced group collaboration made possible via ICT.
- New educational approaches can be used.
- It can provide speedy dissemination of education to target disadvantaged groups.
- It offers the combination of education while balancing family and work life.
- It enhances the international dimension of educational services.
- It allows for just in time and just enough education for employees in organizations.
• It can also be used for non-formal education like health campaigns and literacy campaigns.

e-learning allows higher participation and greater interaction. It challenges the concept that face-to-face traditional education is superior to it. The web and the Internet is the core ICTs to spread education through e-learning. The components include e-portfolios, cyber infrastructures, digital libraries and online learning object repositories. All the above components create a digital identity of the student and connect all the stakeholders in the education. It also facilitates interdisciplinary research. Plomp et al (2009) state that the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn.

Evidence through practical experience in the world indicates that investing in an ICT experience contributes mainly to increasing human and knowledge capital, which benefits the industry as well. Employers gain from the increased knowledge and skills of staff without releasing them for long periods. In addition, investment in production of ICT is a more effective tool for development of the whole society. Research findings show that technology can support pedagogical, curricular, and assessment reforms, which intend to support the process of knowledge creation. Students and teachers plan their learning activities and build on each other’s ideas to create new knowledge. It also facilitates monitoring of their progress in understanding and preparation for lifelong learning and participation in the information society. Besides cost effectiveness, research has proved that ICT is most effective to tackle problems like expanding number of students in each class. ICT enabled distance education provides environmental benefits, as there is a major reduction in the amount of student travel. Economies of scale in utilisation of the campus site are generated. Student housing is not needed which further saves costs.
However, cost of providing the distance education depends on several factors, which include: geography and communities targeted, breadth of courses and class size. It also depends on the technology used; amount of resources deployed in producing course materials as well as how frequently they are updated. E-learning allows delivery, dialogue and feedback over the Internet. It allows mass customization in terms of content and exams. E-education can provide access to the best gurus and the best practices or knowledge available. It is possible to leverage the online environment to facilitate teaching techniques like role-play across time and distance. It can also facilitate the development of scenarios, which can be rarely witnessed in practice. ICT can play a valuable role to monitor and log the progress of the students across time, place and varied activities.

To summarize, the following table shows the main benefits of using ICT in education to the various stakeholders:

**Benefits of ICT in education to the main stakeholders.**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Benefits</th>
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| Student     | • Increased access,  
             | • Flexibility of content and delivery,  
             | • Combination of work and education,  
             | • Learner-centred approach,  
             | • Higher quality of education and new ways of interaction. |
| Employers   | • High quality, cost effective professional development in the workplace,  
             | • Upgrading of employee skills, increased productivity,  
             | • Development of a new learning culture,  
             | • Sharing of costs and of training time with the employees,  
             | • Increased portability of training. |
| Governments | • Increase the capacity and cost effectiveness of education and training systems,  
             | • To reach target groups with limited access to conventional education |
and training,

- To support and enhance the quality and relevance of existing educational structures,
- To ensure the connection of educational institutions and curricula to the emerging networks and information resources,
- To promote innovation and opportunities for lifelong learning.

India is making use of powerful combination of ICTs such as open source software, satellite technology, local language interfaces, easy to use human-computer interfaces, digital libraries, etc. with a long-term plan to reach the remotest of the villages. Community service centres have been started to promote e-learning throughout the country.

**Notable initiatives of use of ICT in education in India include:**

- Indira Gandhi National Open University (IGNOU) uses radio, television, and Internet technologies.
- National Programme on Technology Enhanced Learning: a concept similar to the open courseware initiative of MIT. It uses Internet and television technologies.
- Eklavya initiative: Uses Internet and television to promote distance learning.
- IIT-Kanpur has developed Brihaspati, an open source e-learning platform.
- Premier institutions like IIM-Calcutta have entered into a strategic alliance with NIIT for providing programmes through virtual classrooms.
- Jadavpur University is using a mobile-learning centre.
- IIT-Bombay has started the program of CDEEP (Centre for Distance Engineering Education Program) as emulated classroom interaction through the use of real time interactive satellite technology (Centre for Distance Engineering Education Programme, India, 2009).
- One Laptop Per Child (OLPC) in Maharashtra.
Factors affecting adoption of ICT in education

There is a worldwide need felt for integrating ICT into education in order to improve the pedagogy to reflect the societal change. The main goals of ICT adoption in the education field are reducing costs per student, making education more affordable and accessible, increasing enrollments, improving course quality, and meeting the needs of local employers. Low overheads and cost efficiency are attracting many private players in the field of Internet enabled education. This is also being driven by technological advances, competitive pressures and the positive experiences of many early adopters. The main factors that affect the adoption of ICT in education are the mission or goal of a particular system, programs and curricula, teaching/learning strategies and techniques, learning material and resources, communication and interaction, support and delivery systems, students, tutors, staff and other experts, management, housing and equipment, and evaluation. National vision, supported by coherent strategies and actions is the most important factor in integrating ICT in education. Successful implementation of ICT requires strong national support from government and local support from relevant institutions and education authorities.

The presence of an ICT champion is necessary at all levels of the system. The strong presence of such leadership is evident wherever ICT integration has been initiated successfully. Along with ICT training, one needs an ICT related support mechanism to gradually induce the integration. This is needed as many teachers in face of technical difficulties may tend to revert to the older teaching (non-ICT based) methods. Teachers need support in using and integrating ICT into the curriculum and teaching methods. Teachers, who perceive greater ICT-related support being available to them, use technologies in their teaching much better.

Potential drawbacks of using ICT in education

Although ICT offers a whole lot of benefits there are some risks of using ICT in education which have to be mitigated through proper mechanisms. They are:
1. It may create a digital divide within class as students who are more familiar with ICT will reap more benefits and learn faster than those who are not as technology savvy.
2. It may shift the attention from the primary goal of the learning process to developing ICT skills, which is the secondary goal.
3. It can affect the bonding process between the teacher and the student as ICT becomes a communication tool rather than face to face conversation and thus the transactional distance is increased.
4. Also since not all teachers are experts with ICT they may be lax in updating the course content online which can slow down the learning among students.
5. The potential of plagiarism is high as student can copy information rather than learning and developing their own skills.
6. There is a need for training all stakeholders in ICT.
7. The cost of hardware and software can be very high.

**Summary and conclusions**

Changes in the curriculum do support fundamental economic and social transformation in the society. Such transformations require new kinds of skills, capabilities and attitudes, which can be developed by integrating ICT in education. The overall literature suggests that successful ICT integration depends on many factors. National policies as well as school policies and actions taken have a deep impact on the same. Similarly, there needs to be an ICT plan, support and training to all the stakeholders involved in the integration. There needs to be shared vision among the various stakeholders and a collaborative approach should be adopted. Care should be taken to influence the attitudes and beliefs of all the stakeholders.

ICT can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would enable development of collaborative skills as well as knowledge creation skills. This in turn would better prepare the learners for lifelong learning as well as to join the industry. It can improve the quality of learning and thus contribute to the economy.
Similarly wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. However there exist some risks and drawbacks with introducing ICT in education which have to be mitigated. Successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipment. Also proper controls and licensing should be ensured so that accountability, quality assurance, accreditation and consumer protection are taken care of. ICT enabled education will ultimately lead to the democratization of education.

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