

ICT in Higher Education: Issues and Opportunities

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Abstract— Today Information and communication technologies (ICT) helps to expand access to education and strengthen the relevance of education to the increasingly digital workplace. Higher education in the country is experiencing a major transformation in terms of access, equity and quality. Wider availability of best practices and best course material in education can be shared by means of ICT. ICT can be used as a informative and constructive tool in the education. ICT tools and Internet resources is useful for teaching, learning and administration work in higher education. ICT enabled education has the potential to bridge the digital divide. In this regard the paper addresses the integration of ICTs in various aspects of higher education in the present scenario.

Index Terms— Information and communication technologies (ICT), Higher Education, ICT Tools, Technologies, Policies and strategies.

I. INTRODUCTION

In 21st century higher education in the country is experiencing a major transformation in terms of access, equity and quality. Information and communication technologies (ICT) is a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information. This broad definition of ICT includes technologies as radio, television, video, DVD, telephone, satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail (UNESCO, 2002). ICT is potentially a powerful tool for extending educational opportunities and can provide remote learning resources. ICT encourage students to take responsibility for their own learning and offers problem centered and inquiry based learning which provides easy access and information based resources. It is necessary to acquire the ability to use technology as a tool to research, organize, evaluate and communicate information and the possession of the fundamental understanding of the ethical or legal issues and use of information. [1] [8] [11]

II. REVIEW OF LITERATURE

A review of literature is done from the period of 2003 to 2010 regarding usage of ICT in higher education. Bennett and Bennett (2003), [4] studied the impact of perceived characteristics of instructional technology on faculty members' willingness to integrate it in their teaching. It is

observed that the most important factor which impedes the use of technology in higher education is not the lack of technological facilities or financial funds, but faculty members' reluctance and their disbelief in the use of technology. Mee Chin Wee, (2006) [13] presented the obstacles towards the use of ICT Tools in Teaching and Learning of Information Systems in Malaysian Universities. The most significant obstacles are fast change in ICT tools, extra time and effort needed to integrate ICT tools in teaching, poor network connectivity, and improper evaluation in integration of ICT tools in teaching.

Markus Mostert (2009), [12] has given reflections about usage of ICT in teaching and learning for professional development of academic staff in South Africa. It is suggested that there is a need of professional development for lecturers to use ICT in teaching and learning. A.R. Nadira Banu Kamal (2010) [3] in the research article discuss that the demand of computer technology in education and training has enhanced the ability of quality education in various educational organizations and training institutes. Educators strongly feel that ICT is the most valuable tool to overcome the problem of illiteracy. Author discussed the challenges of academics like rapidly growing new information technologies of multimedia, internet, world wide web and other virtual computer technologies which demands changes in the styles, attitudes and skill towards information handling.

Kourosh Fathi Vajaragh (2010), [11] in the research paper proposes the use of ICT at University level for teaching and learning at Shahid Beheshti University in Iran. Different areas where ICT is implemented and supporting factors required for ICT application are discussed like providing training, academics familiarity with ICT and Intranet, availability of equipped class with PC and increasing students access to digital features and challenges for the implementation of ICT .

Snoeyink and Ertmer [20] concentrated on the importance of previous computer experience towards using technology. Findings are that negative experiences make lecturers less confident and more anxious and anxiety about change and fear of embarrassment when using computers. Yasemin

Usluel (2011), [21] in the case study focuses on ICT usage with the model composed of the variables which explain ICT usage in Turkish higher education and tested within the study. Two dimensions of ICT usage are considered like instructional and managerial. Availability of ICT facilities, access to ICT facilities, usage and purpose of ICT by faculty members are also discussed.

III. ICT AND HIGHER EDUCATION

The use of information and communication technologies in the education process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process. Success of ICT-based education depends upon the teacher's ability to keep pace with the developments since teachers are responsible for quality control, improvement of learning and the aggregate effectiveness of the learning process [3]. The main role of teachers will not be to transmit information and culture, but rather to act as experts and leaders to motivate learning. Using ICTs in higher education administration is fundamentally about harnessing technology for better planning, setting standards, effecting change and monitoring results of the core functions of universities. Three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. The use of educational technology provides teachers with opportunities for traversing an entire continuum of possibilities and different teaching and learning activities. There has a shift from a teacher as a knowledge transmitter to a learning facilitator, collaborator, coach, knowledge navigator. [13],[20]

An analysis of the integration of ICT in higher education involves the consideration of three important dimensions of innovation that have effect on university institutional culture and the professional development of lecturers. The dimensions to be considered are changes in the educational objectives and in the conception of the teaching and learning process, changes in students' and lecturers' roles and changes in university organization [8]. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments. The teachers could make their lecture more

attractive and lively by using multi-media and on the other hand the students were able to capture the lessons taught to them easily.

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. Networked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.[5]. Communication technologies to a great extent, replaced both the teacher and the text books by placing the learners at their own in the learning process. ICT enhance the quality of education by increasing learner motivation, by facilitating the acquisition of basic skills and by enhancing teacher training.

IV. ICT TOOLS AND ONLINE RESOURCES

Appropriate use of ICT can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century. When used appropriately, ICT enable new ways in teaching and learning. These new ways of teaching and learning constitute a shift from a teacher-centered pedagogy to one that is learner-centered. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning. Print media, Audio media, Audio-Visual media, Telecommunication and Multimedia Communication are the different stages of the use of ICTs in India, which are being experienced in educational transaction in all higher educational institutes throughout India.

I. ICT tools used in Higher Education :

- Use of PPT and slide Projector
- Use of General Applications Software(Ms-Word, Ms Excel, Ms Power-point)
- Facility of Intranet & Internet
- Design of multimedia material such as CD, DVD etc.
- Installation and regular update of antivirus

II. Increasing access to Online Resources :

- Subscription to journals & e-books
- e-Learning Content, Mobile Learning Content
- Creating Portals
- EDU-SAT through Distance Mode
- FM Radio through Distance Mode
- Management of Library Automation
- Use of Blogs
- Wiki and Discussion Board to exchange idea asynchronously.

- Use of online chat session, virtual classroom or meeting to exchange idea synchronously.

III. Increasing access to ICT Facilities:

- Wireless networks, Local Area Networks (LANs), campus backbone
- Acquisition of access equipment (computers, laptops, mobile phones)
 - Scalability--- thin clients
 - Access to loan facilities
- Video conferencing facilities
- Create flexible access by opening 24/7/365

IV. Teaching and Learning Activities with ICT tools :

- Lecture Presentation using PPT
- Instructional Designer , Curriculum Development
- Use of bulletin Boards
- Use of Web 2.0 technologies with tools like Blogs, Wikis, Rich Site summary
- E-Portal , Social Networking sites
- Student feedback using ICT
- Collaborate with other faculty members by means of ICT to prepare activities and learning resources.
- Design of Online Tutorship
- Access to the Information System with Internet

V. Measures to be taken for ICT-Based Education

- There is a need to check quality of content development for ICT based educational material. For this training should be conducted for educational content development specialist such as instructional designers, scriptwriters, audio and video production specialist, programmers and web developers.
- Various courses should be launched by using ICT to utilize available resources in the college in a productive form.
- Before starting ICT based teaching and learning activity, a research need to be conducted on the availability and quality of the physical and human resources.
- There is a need of networking through Local Area Network (LAN), Wide Area Network (WAN), Information and Library Network (INFLIBNET) which would lead to increased academic activities and research.
- ICT policy and master plan is a pre-requisite to successful mobilization of funds, both internally and externally, for implementation.
- Recurrent cost of software licenses like applications for the main information systems, specialized applications, database platforms and desk top applications need to be considered. [10] [16] [17]

VI CONCLUSION

Integration of ICTs in higher education is a need of time. In the coming years the thrust will be on the use of Information and Communication Technology to strengthen the system in the mode of open and distance learning . Teacher has to adapt continuous professional development in the educational uses of technology. Institutional and sector-wide higher education ICT policy and planning should identify the specific role of ICT in enhancing research capabilities and provide for adequate infrastructure backed by capacity building. The wide adoption of ICTs calls for mindsets and skill sets that are adaptive to change. Such transformations require new kinds of skills, capabilities and attitudes which can be developed by integrating ICT in education. ICT can affect the delivery of education and enable wider access.

As the government increases its investments in ICT for education, continued efforts must be made to ensure that investments in technology positively impact all aspects of education. ICT enabled education will ultimately lead to the democratization of education.

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