International Journal of Academic Research and Development
ISSN: 2455-4197, Impact Factor: RJIF 5.22
www.academicsjournal.com
Volume 2; Issue 2; March 2017; Page No. 69-73

Role of ICT in higher education

Ruksana Saikia

Research Scholar, Department of Education, Gauhati University, Guwahati, Assam, India

Abstract
This paper attempts to highlight the role of ICT in higher education. ICT in higher education is not only a technique for educational development but also a way of socio-economic development of the nation. The world is moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavor within business and governance. Our higher education system need to improve the quality of education through information technology. Technology has revolutionized the way we think, work, and play. Technology when integrated into the curriculum, revolutionized the learning process.

Keywords: ICT, higher education

Introduction

The National Policy on Education 1986, as modified in 1992, stressed upon employing educational technology to improve the quality of education. Information and Communication Technologies (ICTs) are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information. ICT is a force that has changed many aspects of the way we live. Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation.

Information technology can be simply defined as the interaction of human and machine which under human's control gathers data and disseminates information. The main objective of such a system is to provide information to its user. To accomplish this, data must be evaluated, analysed and processed to produce meaningful and useful information. In the field of education, information technology is widely used.

Higher education systems have grown exponentially in the last five decades to meet the demands of quality education for all. This aspect has further gained momentum due to swift advancements in Information and Communication Technology (ICT). The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. The rapid development of Information and Communication Technology (ICT), particularly the Internet, is one of the most fascinating phenomena characterizing the Information Age. ICT powers our access to information, enables new forms of communication, and serves many on-line services in the spheres of commerce, culture, entertainment and education. 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 and leads to quality enhancement in teaching and learning

Ensuring universal service and access to information and communication technology is a top national objective in many countries. Transfer of knowledge, which is one of the foundations of learning, is among the most fundamental social achievements of human beings. Building strong relationships with students is something that frequently explains why faculty takes pleasure in the challenge of working at a small university. The concept of moving the traditional classroom of desks, notebooks, pencils, and blackboard to an online forum of computers, software, and internet intimidates many teachers who are accustomed to the face-to-face interaction of the traditional classroom.

In view of ICT, education can be classified in three main categories:

1. E-Learning

E-Learning or Electronic Learning is a general term used to refer to computer-enhanced learning. It is also known as online learning. Distance education provided the base for e-learning's development. It overcomes timing, attendance and travel difficulties. E-learning has the following advantages-

- Eliminating time and geographical barriers in education for learners as well as teachers.
- 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.

2. Blended Learning

Blended Learning is the combination of multiple approaches to learning. It is usually used to define a situation where different delivery methods are combined together to deliver a particular course. These methods may include a mixture of face-to-face learning, self-paced learning and online classrooms.

Face to face Learning refers to learning that occurs in a traditional classroom setting where a faculty member delivers instruction to a group of learners. This could include lectures, workshops, presentation, tutoring, conference and much more.

Self-paced Learning provides the flexibility to learn according to the availability of learners' own time and pace, it occurs in a variety of ways such as: reading specific chapters from text book, studying course material presented through web-based or CD based course, attending pre-recorded classes or sessions, reading articles referred by faculty member, working on assignments & projects, and searching & browsing the internet.

Online Collaborative Learning involves interaction between learners and faculty members through the web; this interaction can occur in one of the following modes:

Synchronous interaction: Synchronous, means 'at the same time', it involves interacting with a faculty member and other learners via the web in real time using technologies such as virtual classrooms and / or chat rooms.

Asynchronous interaction: Asynchronous means 'not at the same time'; it enables learners to interact with their colleagues and faculty member at their own convenience, such as interacting through email.

3. Distance Learning

In order to increase the access to higher education and improving its reach to the remotest parts of the country, contribution of open and distance learning facilities is on the increase. It is a type of education, where students work on their own at home or at the office and communicate with faculty and other students via e-mail, electronic forums, videoconferencing, chat rooms, instant messaging and other forms of computer-based communication. It is also known as open learning. Most distance learning programs include a computer based training (CBT) system and communications tools to produce a vital classroom. Because the Internet and World Wide Web are accessible from virtually all computer platforms, they serve as the foundation for many distance learning systems.

Need For the Study

To create ICT-enabled teaching and learning environments, it is also necessary to provide ICT training for teachers. Teachers need to know about ICT and about what ICT can provide. They also need to be able to critically evaluate and discriminate what (technological) resource to use and whether one should be used at all. They need to be able to understand conceptually and in pedagogically appropriate ways, how, where and why to use computer related technologies. Thus, it is clear that teachers need competencies for successful instructional use of ICT. Realizing the importance of ICT in the present day context, the NCTE, in its new regulations (28 NOV 2014), has given special emphasis on ICT in Teacher Education programmes.

Introducing ICT as a tool to support the education sector has initiated substantial discussions since the late 1990s. When looking at the integration of ICT to support the achievement of educational objectives, it can be found that after almost a decade of using ICT to stimulate development, it is not yet fully integrated in development activities and awareness raising is still required.

Today the learners are diverse, want to get educated but at their own time, place, pace and as per their own choice of modern learning resources. Today's generation may be able to enjoy better educational facilities if, the technologies behind the concept of Information and Communication Technology are appropriately integrated in the educational process.

Importance of ICT in Various Fields of Higher Education

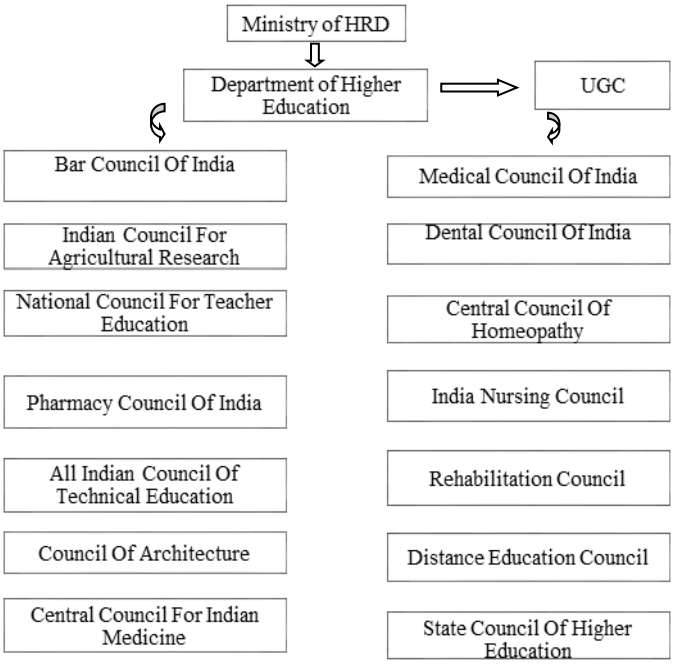
The application of ICTs as a tool for effective enhancement of learning, teaching and education management covers the entire spectrum of education from early childhood development, primary, secondary to higher education. Technology is about the ways things are done; the processes, tools and techniques that alter human activity. ICT is about the new ways in which people can communicate, inquire, make decisions and solve problems.

ICTs can improve the quality of Higher Education in a number of ways: By augmenting student enthusiasm and commitment, by making possible the acquirement of fundamental skills and by improving teacher training. Tools of ICT commonly used in higher education are- 1.Audio equipments like Radio, Mobile etc 2.Video equipments like Digital board, Smart Board etc. 3.Audio-vidual gadgets like Computer, Television, Smart phone etc 4. Projection tools like LCD/LED projector etc. ICTs are also tools which enable and bring about transformation which, when used properly, can encourage the shift an environment which is learner-centered. ICTs which can be in the form of videos, television and also computer multi -media software, that merges sound, transcripts and multicolored moving imagery, can be made use of so as to make available stimulating, thought provoking and reliable content that will keep the student interested in the learning process. The Radio, on the other hand through its interactive programs utilizes songs, sound effects, adaptations, satirical comedies and supplementary collections of performances so as to induce the students to listen and get drawn in to the training that is being provided. The use of online pedagogy within universities and management institutes is increasing. The introduction of the Wi-Fi system too

has led to the growth of hi-tech education system, where accessibility and accountability of subject matter is made readily available to the students. The students can now study and comprehend the related information at their own convenient time.

Higher education plays a pivotal role in the development of a country, as it is viewed as a powerful means to build knowledge based society. In India, higher education imparted by universities is facing challenges in terms of Access, Equity and Quality. The Indian Higher Education System has established itself as the largest system in the world in terms of number of institutions and third largest in terms of student enrollment (after China and USA). The main governing body at the tertiary level is the University Grants Commission, which enforces its standards, advises the government, and helps to coordinate between the center and the state.

The diagram below depicts the different councils of Higher Education functioning under Ministry of HRD –



ICT in Research

Applications of ICTs are particularly powerful and uncontroversial in higher education's research function.

- Communication links make it possible for research teams to be spread across the world instead of concentrated in a single institution.
- The combination of communications and Digital /E-libraries is equalizing access to academic resources, greatly enriching research possibilities for smaller institutions and those outside the big cities.
- Another important dimension of ICTs in research is the use of online full text databases and online research libraries/virtual libraries which are the direct outcome of the growth in telecommunications networks and technology. These databases and libraries provide researchers with online access to the contents of hundreds of thousands of books from major publishing houses, research reports, and peer-reviewed articles in electric journals.
- The application of ICTs in academic research has grown steadily in the past 10 to 15 years in both developing and developed countries, although there are wide variations in usage both within and between countries and regions.
- The most straightforward use of ICTs in research is in data processing. The unprecedented growth in bandwidth and computing power provide opportunities for analyzing/processing huge amounts of data and performing complex computations on them in a manner that is extremely fast, accurate and reliable. Computer data processing not only frees researchers from the cumbersome task of manually analyzing data but more importantly facilitates quick and accurate analysis of huge amounts of data.

ICT in Teaching - Learning

ICT contributes significantly to the classroom teaching-learning process as it helps the teacher to motivate the learners and to make the teaching- learning process more dynamic. ICT can help the teachers to evaluate the learners progress. It renews the learners' enthusiasm because it develops the ability of self-learning. It makes learning experience more effective through its various products. The learners can interact with the teachers, peers, and experts on various issues outside the classroom.

It is too early to say whether the role of ICTs in the teaching function of higher education is truly transformative, or whether it is simply a repackaging of previous pedagogy. ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. Effectiveness, cost, equity, and sustainability are four broad intertwined issues which must be addressed when considering the overall impact of the use of ICTs in education. The educational effectiveness of ICTs depends on how they are used and for what purpose.

The growth of mass higher education has made large classes an endemic feature of several courses at higher education institutions. Large class sizes make it difficult for teachers to employ interactive teaching strategies or to gain insight into the difficulties experienced by students. Large classes pose problems for all students but

students who are under-prepared are particularly affected. It is in these contexts that provide useful opportunities for educational technologies.

ICT in Administration/Management of Higher Education

ICTs are used for -Admissions, student flow, personnel, staff development, Storage and analysis of data, Policy making, Curriculum preparation, Keeping record, Online courses, Online admission, Online Examination, Online payment, Online publishing of results etc.

Benefits of ICT

- It motivates learners through hands-on activity, visual representations and improved modes of presentation;
- Provides in depth understanding of the subject matter.
- Equalizes individual differences and has particularly dramatic effects for students with special needs;
- Facilitates self-pacing with increased capacities to deal with individual learning styles as students can work at the pace and intensity suitable to their needs;
- Enables collaborative learning
- Encourages use of peer coaching and peer reviews;
- Develops communication skills and awareness of different audiences;
- Has impact on resource–based learning and access to real world information through the Web;
- Students get opportunity to participate an International Conference.
- Students get a chance to interact with research scholars from all over the world.
- Increases information reliability and accuracy adding to authenticity of learning tasks, with realistic and up-to-date information;
- Encourages independent learning and individual preferences for process, layout, style and format;
- Gives students more control;
- Allows students to produce high quality multimedia products;
- Changes teacher practices, planning tools and assessment rubrics;
- Has improved students' quality of work and has given them the confidence to perform enhanced learning tasks;
- Has allowed students to learn independently, which has enabled more work to be completed, and
- Opportunity for Learner-centered approach,
- Higher-quality of education and new-ways of interaction.
- High quality, cost effective professional development in the workplace,
- Upgrading of employee skills, increased productivity,
- Developing of a new learning culture,
- Sharing of costs and of training time with the employees,

Challenges of ICT

- While using ICTs in teaching has some obvious benefits, ICTs also bring challenges. First is the high cost of acquiring, installing, operating, maintaining and replacing ICTs. While potentially of great importance, the integration of ICTs into teaching is still in its infancy.
- The other challenge faced is that in many higher educational institutions, the basic requirements as electricity, telephone networks, internet service are not available.
- Also many colleges do not have proper rooms or buildings so as to accommodate the technology.
- Lack of training of the professionals of higher education about the use of ICT.
- Using unlicensed software can be very problematic, not only legally but in the costs of maintenance, particularly if the pirated software varies in standard formats.
- Installing learning technology without reviewing student needs and content availability;
- Imposing technological systems from the top down without involving faculty and students;
- Using inappropriate content from other regions of the world without customizing it appropriately;
- Producing low quality content that has poor instructional design and is not adapted to the technology in use (UNESCO, 2009).
- High cost of content (e-journals, digital libraries)
- Most of the computers are not functioning well.
- Do not have budget to repair the broken computers.
- Lack of proper provision in security system such as CCTV monitoring, security guard etc.

Recommendations

1. ICT should be a compulsory course in all teacher preparation institutions. Teacher preparation should not be based on training for "Computer Literacy" but should prepare teachers for using technologies to construct, represent and share knowledge in real life authentic contexts.
2. On the basis of research, an innovative model of pre-service teacher education should be developed that fulfill our present requirement. It should be remembered that the model has the potential to equip that knowledge and skills and train our future teachers that confidently provide knowledge and instructions in the classroom with the help of modern technologies keeping in view the national and international standards.
3. Sufficient facilities and resources should be provided to in-service and pre-service teachers to practices the ICTs in teaching-learning process. They should be given environment in which they develop their ICT-based competencies.
4. Both theory and practice related to the technological, pedagogical, didactical and social competencies should be the compulsory course of the teacher preparation programs.
5. Computer, internet and electricity should be made available in all higher educational institutions so as to provide access to ICT to both teachers and learners.
6. Compulsory training on the use of ICT should be provided to the Professionals of higher education

7. Administrators must be competent in the use of technology, and they must have broad understanding of the technical, curricular, administrative, financial and social dimensions of ICT use in education.
8. Steps should be taken for the installation of CCTV, employment of security guards etc in each higher educational institutions.

Conclusion

The increasing use of information and communication technologies has brought changes to teaching and learning at all levels of higher education systems (HES) leading to quality enhancements. Traditional forms of teaching and learning are increasingly being converted to online and virtual environments. There are endless possibilities with the integration of ICT in the education system. ICT enabled education will ultimately lead to the democratization of education

A new era of education has been started which necessarily demands a new role of teacher, pupils and education system. In the era of ICT, it will be very difficult for India to cross the digital divide, if concerted efforts are not made to promote ICT education. One of the strategies to be adopted in this regard is the production of teachers who have developed competencies for the successful instructional use of ICT in education. Those teachers are called 21st century teachers who will possess the technological, pedagogical, and social competencies in them and they will shape the personality of their pupils on constructivist level.

Thus ICT refers to the integration of computing technology and communication. It allows us to get information and to communicate with each other or to have an effect on the environment using electronic or digital equipment.

References

1. Bhowmick Debashis. ICT in Education in India, Edutracks, Neelkamal Publications Pvt Ltd. 2014, 4.
2. Sing Kamal Deep, Kaur Daljeet. ICT Mediated Education. Dhanpat Rai Publishing Company Pvt Ltd. 2013.
3. Husain Noushad. Teacher Competencies for the Use of Information Communication Technology" Journal Of Indian Education, NCERT Publication. 2010, 36(3).
4. Nadira Banu Kamal AR. Impact of ICT in Higher Education - A survey in colleges of Ramanathapuram District, Tamil Nadu, India retrieved from WWW.Slideshare.net.
5. ICTs for Higher Education, Background paper from the Commonwealth of Learning, UNESCO World Conference on Higher Education. 2009, 5(8). retrieved from http://unesdoc.unesco.org