Role of ICT in Higher Education and Its Challenges for the 21st Century

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Abstract

Education means development of overall personality which includes physical, cognitive, affective and spiritual well-being of learner. ICT (Information and Communication Technology) is a gift of 21st century to human-kind. In recent years, ICT has rapidly acquired a special place in society. Without doubt, this is also true in education. However, one of the most common problems of using ICT in education is to base choices on technological possibilities rather than educational needs. This paper attempts to highlight the role of ICT in higher education and its challenges for the 21st century.

Keywords: Higher Education, Information and Communication Technology (ICT)

Introduction

Education plays an important role in the development of any nation. Education tells people how to think, how to act, and how to make decisions. The better your education, the more choices and opportunities you are going to have in life. In India, education system was as old as the Indian civilization, but the modern education system faces many challenges. When we talks about education, we do not limit us with formal education, it also includes informal and non-formal education.

In India, higher education is viewed as a powerful means to build knowledge based society. 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*)*. While several new institutions have emerged due to significant increase in private sector participation over the last few years, concerns remain regarding the quality of education being imparted to students.

What is ICT?

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. 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. ICT is a force that has changed many aspects of the way we live.

When looking at the integration of ICT to support the achievement of educational objectives, it can be found that after almost two decade of using ICT to stimulate development, it is not yet fully integrated in development activities and awareness rising is still required. ICT is about the new ways in which people can communicate, inquire, make decisions and solve problems. It is the processes, tools and techniques for:

- gathering and identifying information
- classifying and organizing
- summarizing and synthesizing
- analyzing and evaluating
- speculating and predicting

ICT and Higher Education

The major teaching and learning challenges facing higher education revolve around student diversity, which includes, amongst others, diversity in students' academic preparedness, language, caste, gender, class and schooling background.

Integrating ICT in teaching-learning process is high on the educational reform agenda. ICTs need to be seen as an essential aspect of teaching toolkit in the 21st century, affording new and transformative models of development that extend the nature and reach of teaching-learning process wherever it takes place.

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.

ICT in Research

Application of ICT in higher education research is very powerful. Research area in higher education benefited the most from the use of ICT. The application of ICTs in academic research has grown steadily in the past 10 to 15 years in both developing as well as developed countries, although there are wide variations in usage both within and between countries and regions.

In India, four areas are particularly important for ICT in research:

- Firstly, it provides the infrastructure (computers, broadband, wireless, etc), data collection and storage, processing, computing power, visualization, simulations.
- Secondly, the combination of communications and digital libraries is equalizing access to academic resources, greatly enriching research possibilities for smaller institutions and those outside the big cities. Digital libraries are very useful for the institutions specially situated in the tribal and rural area. These digital 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.
- Thirdly, the steady increases in bandwidth and computing power available have made it possible to conduct complex calculations on large data sets.
- Lastly, communication links make it possible for research teams to be spread across the world instead of concentrated in a single institution.

ICT in Teaching

ICTs are a powerful tool for extending educational opportunities, both formal and non-formal, to scattered (tribal) 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 teaching-learning process possible and within a reach, 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, 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.

United Nations Educational, Scientific and Cultural Organization (UNESCO) principles on ICT in education can be summarized as follows:

- Old and new technologies need to be used in a balanced way. On-the-air and off-the-air radio/radio-cassette, television and offline video-assisted technologies are still considered valid and cost-effective modes of education delivery, as important as more interactive computer/Internet-based virtual education or online distance learning.
- The demand for higher education cannot be met in both the developed and developing world without distance or virtual modes of learning.
- Vocational training needs cannot be met without virtual classes, virtual laboratories, etc.
- Educational goals cannot be met without gender sensitivity. Wherever possible, the proposed indicators will address the need to measure the gender gap.

Large Classroom

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 these contexts that provide useful opportunities for educational technologies.

Use of ICTS for Inclusive Education

Inclusive Education proposes all students are provided with equal access to education within the context of a mainstream educational system and not in a segregated setting. Accessible ICTs have a major role to play in enabling educational authorities, educators, students and parents to move towards a more inclusive educational system.

Specific benefits for students:

- Computers can improve independent access for students to education

- Students with special educational needs are able to accomplish tasks working at their own pace

- Visually impaired students using the internet can access information alongside their sighted peers

- Students with profound and multiple learning difficulties can communicate more easily

- Students using voice communication aids gain confidence and social credibility at college/university and in their communities as well

- Increased ICT confidence amongst students motivates them to use the internet at home for assignment and leisure interests.

Benefits for teachers:

- Supports reflection on professional practice via online communication

- Enhances professional development and the effectiveness of the use of ICT with students through collaboration with peers

- Materials already in electronic form (for example, from the internet) are more easily adapted into accessible resources such as large print or Braille.

Benefits for parent:

- Use of voice communication aids encourages parents to have higher expectations of children's sociability.

Challenges Faced By ICT in India

While using ICTs in teaching has some obvious benefits, ICTs also bring challenges.

- Firstly, the high cost of acquiring, installing, operating, maintaining and replacing ICTs.
- Secondly, introducing ICT systems for teaching in India has a particularly high opportunity cost because installing them is usually more expensive in absolute terms than in industrialized countries whereas, in contrast, alternative investments (e.g., buildings) are relatively less costly here.
- Thirdly, 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.
- Fourthly, even though students can benefit immensely from well-produced learning resources, online teaching has its own unique challenges as not all faculties are ICT literate and can teach using ICT tools.
- Fifthly, the basic requirement of electricity and telephone networks is not available in some part of the country. Also many collages do not have proper rooms or buildings so as to accommodate the technology.
- Lastly, the four most common mistakes in introducing ICTs into teaching are:

i) installing learning technology without reviewing student needs and content availability;

ii) imposing technological systems from the top down without involving faculty and students;

iii) using inappropriate content from other regions of the world without customizing it appropriately; and

iv) Producing low quality content that has poor instructional design and is not adapted to the technology in use.

In India, another challenge is that the teachers need to develop their own capacity so as to efficiently make use of the different ICTs in different situations. They should not be scared that ICTs would replace them as English being the dominant language most of the online content is in English. This causes problems as in India the people are not comfortable with English.

Conclusions

As move into the 21st century, many factors are bringing strong forces to bear on the adoption of ICTs in higher education. It is believed that the use of ICT in education can increase access to learning opportunities. It can help to enhance the quality of education with advanced teaching methods, improve learning outcomes and enable reform or better education systems. The integration of ICTs in higher education is inevitable. One of the great benefits of ICTs in teaching is that they can improve the quality and the quantity of educational provision. For this to happen however, they must be used appropriately. The use of ICT creates an open environment which enables the storage and the reuse of information materials as also it enables the interface among the teachers as well as students.

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