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IMPACT OF ICT ON TEACHING AND LEARNING PROCESS IN INDIA WITH REFERENCE TO HIGHER EDUCATION

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ABSTRACT

The initiation of Information and communication technology has made tremendous changes in the present day world. There is no area that has not been influenced by this digital phenomena. The advent of ICT in education helped to improve the quality of education where teaching and learning eventually became an engaging active process related to real life. The impact of ICT for teaching and learning process has become pertinent as it facilitates teaching and learning process, create conducive learning environment, and help learners develop creative thinking and self confidence. Introduction of ICT in higher education has profound implications for the education process especially in dealing with key issues of access, equity, management, efficiency, pedagogy and quality of teaching. At the same time, Optimal utilization of opportunities arising due to diffusion of ICT in higher education system presents a profound challenge for institutions. Quality education ushers in a lifetime of opportunity, which helps build a strong and diverse citizenry to work and live in an increasingly competitive world. Higher education provides the competencies that are required in different spheres of human activity. In this study addresses the opportunities and challenges posed due to integration of ICT in various aspects of higher education in the present scenario and it's impact on teaching and learning process in India.

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INTRODUCTION

Education is one of the most powerful instruments for reducing poverty and inequality. It is equally important to enhance the competitiveness in the global economy. Knowledge is the driving force in the rapidly changing globalized economy and society. Education in general and higher education in particular, is a highly nation specific activity, determined by national culture and priorities. The Indian higher education system has emerged as one of the largest in the world, with 14.6 million students enrolled in more than 31,000 institutions. The number of institutions has grown at a CAGR of 11%. Education is essential for the growth and prosperity of both a nation and society. Apart from primary and secondary education, higher education is the main instrument for development and transformation. Higher education has the omnipotent role of preparing future leaders for different spheres of life-social, economic, political, cultural, scientific and technological. According to UNESCO Report on Education in the 21st century, Higher Education is the mandate to bridge the knowledge gap between countries and communities, enriching dialogues between people culture; international linking and net-working of ideas, research and technologies. Thus, Higher education provides the competencies that are required in different spheres of human activity, ranging from administration to agriculture, business, industry, health and communication and extending to the arts and culture. According to Dr. Babasaheb Ambedkar (Bombay, Legislative council Debate,27 july,1927), " The university is a machinery whereby education facilities are provided to all those who are intellectually capable of using those facilities to be the best advantages but who cannot avail themselves of those facilities for want of funds or for other handicaps in life". The people in university education shape the behaviour; minds and the social and human values of the student community .Effective use of technology can motivate students, make our classes more dynamic and interesting and renew teacher enthusiasm as they learn new skills and techniques. Technology is also helping the students to understand any abstract concepts clearly.ICT has become an integral part of today's teaching learning process. The integration of ICTs in teaching in general and teacher education in particular is the need of the day.

The use of ICTs can make substantial changes both for teaching and training mainly in two ways; firstly, the rich representation of information changes learner's perception and understanding of the context. Secondly; the vast distribution and easy process access to information can change relationships between teachers and taught.ICT can also provide powerful support for educational innovation. In the last few decades, we have seen an increasing number of youngsters gaining access to higher education .This phenomenon reflects a trend at a global level ,which is largely due to the democratisation and development of societies, the improvement of living conditions and structures ,the demand for a more highly qualified performance both in professions and citizenships we have, therefore witnessed a change both in terms of quality as well as quality in the student population ,reflected in the gradual loss of the elitist and formal character of higher education through the admission of individuals from all social classes. "The emancipatory and transformative potentials of the ICT in higher education in India has helped increase the country's requirement of higher education through part- time and distance learning schemes. 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 overcome time and distance barriers."(MC Gorry, 2002).

Information and Communication Technology (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. 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. The concept of a "Digital Divide" has been around almost as long as ICT has been publicly available. While traditionally it has come to mean a division in society, based on socioeconomic factors, this does not 'paint the entire picture'.

Introducing ICT as a tool to support the education sector has initiated substantial discussions since the late 1990s. A decade ago the emphasis was on Technical and Vocational Education and Training and training teachers. During the last few years, an increasing number of international development agencies have embraced the potential of ICT to support the education sector. UNESCO has played a major role in spearheading the Education for All initiative to harness the potential of ICT. The widely subscribed Dakar Framework for Action recognizes that, 'these technologies (ICTs) have great potential for knowledge dissemination, effective learning and the development of more efficient education services'. 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 rising is still required.

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 and schooling background. Education is perhaps the most strategic area of intervention for the empowerment of girls and women in any society and the use of information and communication technologies (ICTs) as an educational tool in the promotion of women's advancement has immense potential. 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, tertiary, basic education and further education and training.

Integrating ICT in teaching and learning is high on the educational reform agenda. Often ICT is seen as indispensable tool to fully participate in the knowledge society. ICTs need to be seen as "an essential aspect of teaching's cultural toolkit in the twenty-first century, affording new and transformative models of development that extend the nature and reach of teacher learning wherever it takes place" (Leach, 2005). For developing countries like Vietnam, ICT can moreover be seen as a way to merge into a globalizing world. It is assumed that ICT brings revolutionary change in teaching methodologies. The innovation lies not per se in the introduction and use of ICT, but in its role as a contributor towards a student-centred form of teaching and learning. The Information and Communication Technology (ICT) curriculum provides a broad perspective on the nature of technology, how to use and apply a variety of technologies, and the impact of ICT on self and society. 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. It is the processes, tools and techniques for:

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

Enhancing and upgrading the quality of education and instruction is a vital concern, predominantly at the time of the spreading out and development of education. ICTs can improve the quality of 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. ICTs are also tools which enable and bring about transformation which, when used properly, can encourage the shift an environment which is learner centred. 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.

Impact of ICT on Teaching and Learning Process

ICT has the following impacts on the teaching and learning process

Investigating reality and building knowledge: ICT allows students to investigate more thoroughly the real world. They can more readily access information sources outside the classroom and can use tools to analyse and interpret such information. Information may be accessed through online systems or through data logging systems. It also makes it easier for individuals to interact and gain expert knowledge with a very short time, thus making the acquisition of knowledge to take place easily within a very short period of time (Amalnik, Moayyedi, & Mirzaei, 2015)

Active learning and authentic assessment: ICTs potentially offer increased possibilities for codification of knowledge about teaching and for innovation in teaching activities through being able to deliver learning and cognitive activities anywhere at any time (Larsen & Vincent-Lancrin, 2005). In many classroom situations it is difficult to allow students to be sufficiently active as participants. Typically students are often passive, spending a lot of time listening or reading. It is well known that students are more likely to be interested and attentive and will achieve a wider range of learning outcomes if they can be active. Their engagement with the curriculum will increase as they are afforded opportunities to create their own information and represent their own ideas. Expert system can be used to provide students with learning experiences where they are interacting directly with the computer system, and are not just passive but active participants in the learning process, thus increasing the quality of education (Salekhova, Nurgaliev, Zaripova & Khakimullina, 2013). According to Motamedi (undated), technology makes the students take an active role in learning instead of taking on a passive role of receiving information from the teacher.

Engage students by motivation and challenge: The interactive and multimedia nature of modern computer system has provided the opportunity for software developers to create increasingly more stimulating features. Computer system does provide the opportunity to create a wide range of interesting learning experiences as it makes learning, participatory and a social process supporting personal life goals and needs (McLoughlin and Lee, 2007). This is likely to help to maintain student interest and interest a wide range of students (Cradler & Bridgforth, 2002). The interactive and multimedia features within software can be used to help students grapple with concepts and ideas.

Provide tools to increase student productivity: In the past students have spent a lot of time doing repetitive, low-level tasks particularly involving writing, drawing and computation. While it may be necessary for students to developing these skills at some times on most occasions they are pre-requisite to some higher level task. Unnecessary repetition of low-level tasks is inefficient, non-motivational and may obscure the real purpose of the learning activity. Many computer applications provide the tools to support students in quickly completing these lower-level tasks so that they can focus on the main purpose of the activity. Word processors, graphics packages, database packages, spreadsheets and other software support the performance of students. ICT has transformed teaching and learning processes from being highly teacher-dominated to student- centred, and that this transformation will result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills (Bhaurao, 2015).

Provide scaffolding to support higher level thinking: There is an increasing range of software tools which can be used to support the development of higher thinking skills such as application, analysis and synthesis (The National Foundation for the Improvement of Education, 2001). Tools can be used to analyze data, present data, link data or information, present information in different formats, simulate environments and conditions and support interactive communications. This allows teachers to consider providing a range of activities to assist students to become critical thinkers, designers and problem solvers.

Increasing learner independence: Computer systems are increasingly being used to provide learning experiences when and where they are needed. This provides students with greater independence not only in terms of when and where they learn but also what they learn (Cradler and Bridgforth, 2002).

Collaborative and co-operative learning: The use of ICT leads to more co-operation among learners within and beyond school and a more interactive relationship between students and teachers. Note: Collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers while co-operation is a structure of interaction designed to facilitate the accomplishment of a specific end product or goal through people working together in groups.

Tailoring learning to the learner: In most traditional learning situations it is not possible to provide each student with an instructor and for that instructor to specially design learning experiences for that student. The closest to this is the apprenticeship system. The programmability and interactivity possible with computer systems provides the opportunity to develop software which stimulates the role of an instructor. Intelligent tutoring software may use information about the student to recommend appropriate sequences or sections of a tutorial for the student (Cradler and Bridgforth, 2002).

Overcome physical disabilities: The variety of input and output devices available provides the opportunity for students who are physically handicapped to be involved in the same learning activities as other students. For some students computers provide the only environment which they can manipulate and the only tools that reduce their level of disability. Modified keyboards and mouse-drivers may be used to allow extremely handicapped students to use regular software packages. For students who are not able to take notes during the course of the class, the system stores in a database lessons already taken for further studies and provides a more user friendly environment for blind students through audio interpretation of the course (Bingimlas, 2009), thus enhancing their learning.

Educational productivity: Productivity is a concept most happily found in economics textbooks where the productivity of a worker or economic unit is defined by dividing the output (revenue) by the input (cost). This is more difficult to define for the education industry since the output is not easily measured, particularly not in monetary terms to compare with the costs. The output is largely the quantity and quality of learning demonstrated by students, or learning outcomes. Educational technology should influence educational outcomes and costs. If the most appropriate educational technology is selected by a teacher then student learning should be optimized, which means an increase in the value of the outcomes.

Student learning: There are many potential uses for computers in the learning process. In some situations changes in relevant industries makes computer use in schools imperative. For example, to provide courses in music, technical drawing, statistics, and business which do not incorporate computer use reduces the relevancy of the courses to the real world. Here the rationale cries out from the work place but needs to be responded to with careful impact of ICT on learning and teaching.

Management of learning experiences: The management of high quality educational programmes requires and generates large quantities and types of data. Teachers face many management problems which when analysed could be suitable for a computer solution. There are many such tasks which may be both time consuming and tedious for which teachers should consider a computer solution. Such tasks may include: the organization of assessments, the maintenance of library functions, the preparation of reports and the organization of events. There are many school management packages which will complete tasks such as these and thereby free up a substantial amount of time for other more important tasks. Schools should make use of the opportunity to continually provide more appropriate solutions to the dynamic problems associated with the provision of schooling.

Impact On The Curriculum: Information and Communication Technology (ICT), impacts on educational standards only when there is fertile background for making efficient use of it (Machin, 2006). Earlier it was argued that there is a two-way relationship between ICT and the curriculum where ICT may be used to assist in conveying the curriculum but at the same time may change the content of the curriculum. Further research has shown that the effectiveness in the use of ICT to support learning is a function of the curriculum content and the instructional strategy such that when appropriate content is addressed using appropriate strategies students and teachers will benefit (Cradler and Bridgforth, 2002; Sharma, 2015). The impact of ICT on curriculum content may be viewed in terms of:

- Declarative knowledge – describes objects and events by specifying the properties which characterize them.
- Procedural knowledge – focuses on the processes needed to obtain a result.

Most educators would perceive the impact of ICT on the curriculum to be positive. With the use of ICT students can use more primary source material and be encouraged to address real problems and develop analytical and interpretive skills.

The classroom can be a part of the learning process in an open and continuing dialogue. While the impact will be evident on almost all disciplines of learning, the degree will vary substantially (Becta, 2006). According to Balanskat, Blamire and Kefala (2006), ICT is said to enable teachers to save time and to increase productivity in such activities as:

- Access to a variety of information sources, forms and types
- preparing and updating daily lessons;
- plans, making hard copy visualisations and handouts for classes, as well as individualised educational plans for slower students and students with disabilities or with special problems;
- presenting visual/oral content materials, tasks, and questions to the audience;
- maintaining grade books;
- compiling a data bank of exam questions;
- online inspection and correction of students‟ work on their computers; and
- keeping records, chronicles, and archives of all the above-mentioned events and proceedings with fast retrieval and easy access to any entry.

ICT can enhance teaching by enhancing what is already practiced or introducing news and better ways of learning and teaching (European Schoolnet, 2004). It has a positive effect on behaviour, motivation, communication and process skills of students and teachers.

Advantages of ICT in Higher Education: Use of ICT in education presents a unique opportunity to solve multitude of challenges quickly as well as at low rate. Here is an overview of advantages of an ICT:

Motivating Factor: The internet can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest excitement and enthusiasm about the Internet for the purpose enhancing learning. For already enthusiastic learners, the internet provides them with additional learning activities not readily available in the classroom.

Fast communication: The internet promotes fast communication across geographical barriers. Students can join collaborative projects that involve students from different states, countries or continents.

Co-operative learning: The internet facilitates co-operative learning, encourages dialogue and creates a more engaging classroom. For example, a LISTER V for our class will allow students to get involved in class discussions through e-mails in a way not possible within four walls of classroom.

Locating Research materials: Apart from communication, research is what takes many people to the internet. There are many resources on the internet than the school library can provide.

Acquiring varied writing skills: If students are required to publish their work on the internet, they have to develop hypertext skills. These skills help students gain experience in non sequential writings.

Conclusion

As we move into the 21st century, many factors are bringing strong forces to bear on the adoption of ICTs in education and contemporary trends suggest will soon see large scale changes in the way education is planned and delivered as a consequence of the opportunities and affordances of ICT. 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 management of education systems. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on: What is learned, how it is learned, when and where learning takes place, & who is learning and who is teaching. The continued and increased use of ICTs in education in years to come, will serve to increase the temporal and geographical opportunities that are currently experienced. The integration of ICTs in higher education is inevitable. The very high demand for higher education has stimulated significant growth in both private and public provision. ICTs in the form of Management Information Systems are increasingly universal. The strength of computers in teaching is their power to manipulate words and symbols - which is at the heart of the academic endeavour. ICT has also led to the emergence of Open Educational Resources (OERs).
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. Apart from having enabling telecommunications and ICT policies, governments and higher education institutions will need to develop strategies for effective ICT and media deployment and sustainability.

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