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ICT and Education :Creating Virtual Classroom

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Abstract

There are various Information and Communication Technology (ICT) tools available which can be utilized for the knowledge creation and dissemination in the modern world. Tools include Radio, T.V, Internet, Mobile phone, Computer, laptop, tablets and many other hardware and software applications. Certain ICT tools like laptops, PCs, mobile phones, and PDAs have their own implication in Education. These devices can be used in imparting education and training for teachers and students. Many of the ICT tools are much hyped but have not given fruitful results till now. Present paper is an effort to find out how these technologies are affecting the modern day education.

Key Words

Information and communication Technology, ICT, Higher Education, Virtual Classroom

INTRODUCTION

Education is a life-long process but in the traditional concept it is considered as something acquired during youth to serve for an entire lifetime. With the emergence of new global cultural forms, media, technologies of communication and most significantly, the telematics revolution, teaching and learning behavior have changed. The 'real world' outside the classroom seems to have been totally transformed under the impact of 20th and 21st century. The advent of the Internet have led to emergence of "E" in education and training, both in the academic and business worlds by providing unique alternatives for reaching larger audiences than ever before possible. Today the demand for educational technology is high, and when technology is used thoughtfully and is learner centered, the results are gratifying. Again and again, we have witnessed the power of technology to enable people to learn and to interact, even in the most remote areas of the developing world. Through increased outreach we are helping to build the IT capacity of underserved populations such as people in rural areas, women, those with disabilities, and speakers of minority languages. Lower costs and more flexible, adaptable, and user-friendly hardware are making this possible.

HIGHER EDUCATION SCENARIO IN INDIA

India has one of the largest higher education systems in the world consisting of over 651 universities according to UGC as on 2013. Besides there are 31,324 colleges of higher learning in the country as on August 2011 according to the Higher Education in the 12th Five-Year Plan Report (2012-17). The number of students enrolled in the universities and colleges has increased since independence to 13,642 million in the beginning of the academic year 2009-10 with 1,669 million (12.24%) in the university departments and 11.973 million (87.76%) in the affiliated

colleges (MHRD, Annual Report, 2009-10). However, this growth in numbers does not reflect much improvement in the delivery of higher education in the country.

Type-wise classification of Universities in India.

Sl. No.	Type of Institution	No. of Institution (As on 2006)	No. of Institution (As on 2013)
1	Central Universities	20	44
2	State Universities	217	310
3	Private Universities	8	168
4	Institutions Deemed to be Universities	104	129

Source: UGC Website.

Key Issues in higher education in India	
Access • Low enrolment rates in higher education with GER of 19.4 at the higher education stage (18-23 years) • GER significantly less than in countries such as US (89), Russia (76), UK (59), Malaysia (40), China(24)	Equity • Gender disparities in higher education (GER of 17.1 for males and 12.7 for females in 2009-10) • Social inequities in access to higher education (GER of 12.2 for SCs and 9.7 for STs in 2009-10) • Regional disparities in higher education (10.5 in Bihar; 32.9 in Tamil Nadu, including rural-urban variations
Quality • Significant levels of faculty vacancies (40% in 2008) in institutes • Concerns over quality of faculty in higher education • Varying quality of education provided in institutes; low level of accreditation • Limited motivation for learning due to evaluation process in colleges • Inadequate focus on research in higher education • Lack of adequate infrastructure and equipment • Low employability and skills of graduates	Governance and Financing • Issues in universities arising from affiliation resulting in administrative burden on universities • Governance issues in universities such as lack of appropriate structures and limited autonomy • Financial constraints in higher education, particularly for state level institutions • Lack of clear regulatory framework for private sector participation in higher education

MAJOR ICT INITIATIVES IN EDUCATION

India has taken up major initiatives in terms of content delivery and furthering education through Information and Communication Technology. For instance GyanDarshan was launched in 2000 to broadcast educational programs for school kids, university students, and adults. Similarly GyanVani was another such important step which broadcast programs contributed by institutions such as IGNOU and IITs. Under the UGC country wide classroom initiative, education programs are broadcast on GyanDarshan and Doordarshan's National Channel (DD1) everyday. E-Gyankosh which aims at preserving digital learning resourcesis a knowledge repository launched by IGNOU in 2005. Almost 95% of IGNOU's printed material has been digitized and uploaded on the repository. The National Programme for Technology Enhanced Learning (NPTEL) launched in 2001 is another joint initiative of IITs and IISc which promotes education through technology. Moreover, the ambitious National Mission on Education through ICT was launched by the government to harness ICT's potential throughout the length and breadth of the country. In 2009, the government approved the landmark "National Mission on Education through ICT" scheme. The National Mission on Education through ICT is centrally sponsored scheme submitted by the Ministry of HRD and approved by the Cabinet Committee on Economic Affairs (CCEA). The Mission has planned a variety of initiatives aimed at developing and standardizing digital content for Indian higher education segment. The Mission envisions catering to the learning needs of 500 million people in the country

The ICT Revolution(s)

Revolution 1: The Computer The first revolution started during World War II, with the first large, automatic, general electromechanical calculator, Harvard Mark 1. It was 50 feet long, eight feet tall, and weighed five tons. A couple of years later, ENIAC was presented in Philadelphia, based on radio tubes and practically without any internal memory, yet using 18,000 vacuum tubes and weighing 30 tons. Each time a new task was to be performed, some 6,000 switches covering three walls had to be thrown. In 1947, Walter H. Brattain, John Bardeen, and William Shockley created the first transistor, and, on its basis, faster and more powerful computers were constructed. "Computers" became a new catchword, and input-output technology graduated from punch cards to magnetic tape, Applications also were expanded, from use in academic research to weather forecasting, from airline ticketing to accounting

Revolution 2: The PC The second ICT revolution has its roots in the 1970s, when the first "processors on a chip" and magnetic discs wereconstructed. But as late as 1977, Ken Olson, the legendary president of the computer company, Digital, stated: "There is no reason anyone would want a computer in their home." He was definitely wrong. In the same year, Steve Jobs and Steve Wosniak started to sell their Apple II, and Bill Gates and Paul Allen had already founded a firm called Microsoft. From being an esoteric toy, the personal computer gradually became a valuable tool for word processing, accounting, and, after a while, pictures. IBM, which at first grossly underestimated the markets for the personal computer (PC), launched its first machine under that name in 1981.

Now the PC has become as widespread as the radio when our grandparents were young— indeed, as widespread as bicycles are among today's youth.

Revolution 3: The Microprocessor The third ICT revolution is that microprocessors have become embedded in an ever-widening range of products: the steering systems of airplanes, the control panels of hydroelectric power stations, domestic air conditioning systems, the traffic lights in our streets. Even when we do not recognize it, they have become part of our everyday lives: in video players, credit cards, remote controllers, cameras, hotel room door locks, and smart buildings. An ordinary household now contains some 100 microprocessors, in everything from dishwashers to alarm systems. Microprocessors constantly expand their capacity, applications, and users.

Revolution 4: The Internet The fourth ICT revolution stretches back to the late 1960s, when the U.S. Department of Defense drew up guidelines for a communication network among computers (ARPANET). After a while, universities in and outside the United States were hooked up to it, and some started to use it to send messages. France developed its variant—its

Minitel system—at the beginning of the 1980s, at the same time the U.S. National Science Foundation set up its own network among academic institutions that later became part of Internet. A dozen universities on the U.S. East Coast with IBM mainframes contributed with BITNET. In Europe, EARN became a network among academic institutions, while CERN in Geneva was crucial in the development of the World Wide Web, which got its name in 1990. A couple of years later, surfing on the 'net started, and more and more people hooked up. A PC needed a modem to use its potential fully. This fourth ICT revolution continues like the others as more and more computers are interlinked with an ever-growing number of "servers" and an expanding range of applications. Yet, the most important part of the fourth ICT revolution was this: on the computer networks engineers had constructed, users built social networks to make them useful and effective—in this case, the social superstructure built on the material basis became really super.

Revolution 5: Wireless Links The fifth ICT revolution was linking without lines—the new possibilities opened by mobile phones. At first, they were big and bulky. Reduction in size and weight was accompanied by expansion of reach and functions, and miniaturization was accompanied by multifunctionality. Mobile phones could be used not just for talking, but also to exchange messages, receive news or stock exchange quotes, review restaurants, or order movie tickets. Phones are no longer only for transmitting phonemes; now they can transmit written messages, pictures, and music. Linking without lines now takes place not just intercontinentally via satellites, but also via high frequency short-range radio transmitters covering a specific area or cell (hence the name, "cellular phones") and inside buildings by "Bluetooth" and infrared light.

ICT FOR EDUCATION: THE POTENTIAL

Different ICTs have the potential to contribute to different facets of educational development and effective learning: expanding access, promoting efficiency, improving the quality of learning, enhancing the quality of teaching, and

improving management systems. ICTs also offer possibilities in lifelong learning, adult training and e-training for the workplace.

Education for Everyone

Modern economic, social, political, and technological requirements demand that all members of society have a minimum level of basic education. No country can afford to leave anyone behind. People without the ability to acquire essential knowledge and skills will live precariously, and society will be deprived of their contributions. Similarly, selective opportunities for higher levels of education must reflect equity concerns so that in times of rapid educational change, historical disparities by gender, region, or social grouping are not propagated. The biggest challenge is to reach individuals and groups that are historically underserved: girls and women, who face cultural and physical obstacles to educational institutions; rural populations that are too thinly dispersed to populate "regular" schools with reasonable class sizes; adult workers who have no time to attend regular courses; and persons who cannot come to learning centers because of security hazards. Here we need to be innovative and think radically. In some situations, we may need to go "over" the hurdles and provide education where these potential learners are—anywhere and everywhere.

Education Anytime

The need for continuous access to information and knowledge makes learning lifelong and the traditionally neat distinction between learning and work unreal. Education thus becomes a continuum, with no marked beginning and end, which provides opportunities for lifelong learning to help individuals, families, workplaces, and communities to adapt to economic and societal changes, and to keep the door open to those who have dropped out along the way. Learning throughout life is one of the keys to the 21st century, for a number of reasons:

1. Rapid technological change and growth in knowledge and information require constant learning.
2. As society evolves, we are unlikely to continue the present life-cycle pattern of prolonged education at the beginning of life and an extended retirement period at the end.
3. Lifelong learning provides opportunities for those who are unemployed to reenter the workforce.
4. Given the importance of learning foundations, and of continued learning in knowledge-intensive societies characterized by rapid change, those who miss out— either initially or later on—are effectively excluded.

Education Anywhere

Lifelong learning and training for the workplace cannot be confined to the traditional classroom. It is unrealistic and unaffordable to continue to ask learners to come to a designated place every time they have to engage in learning. To cope with the diversity, complexity, and changing demands for education services, delivery must extend beyond the faceto- face institutional modality to include distance education, enrichment mass media, and nonformal settings.

Teacher Empowerment

Teaching is one of the most challenging and crucial professions in the world. Teachers are critical in facilitating learning and in making it more efficient and effective, and they will continue to be in the future. Modern developments may have eased some teaching burdens, but they certainly have not made life easier for teachers:

1. The objectives of education have become more complicated. It is no longer sufficient to teach a certain body of knowledge and skills. Teachers are expected to help students to acquire higher levels of cognitive skills— problem solving, creativity, collaborative learning, synthesis, and, above all, the skill of how to learn new knowledge and apply that knowledge to new situations.
2. For learning to take place, learners have to be active, learning has to be meaningful and authentic, and the learning environment should be challenging but not stressful—all easier said than done!
3. Knowledge is expanding rapidly, and much of it is available to teachers and students at the same time. This puts an unavoidable burden on teachers to continue updating their knowledge and exposing themselves to modern channels of information.
4. The social environment in many countries is making it more difficult for teachers to manage classrooms and learning processes. Teachers' authority is challenged and their knowledge questioned continually. Students, in many instances, are becoming less respectful and more belligerent, and in some extreme cases, teachers are functioning in the face of physical threats and psychological duress.
5. Information and communication technologies have brought new possibilities into the education sector, but, at the same time, they have placed more demands on teachers. They now have to learn how to cope with computers in their classrooms, how to compete with students in accessing the enormous body of information—particularly via the Internet, and how to use the hardware and software to enhance the teaching/learning process.

From Conventional Learning	**To Technology Enabled**
-Traditional Learning Model	Continuous Learning Model
-Classroom (Fixed Location)	Anytime…Anywhere (Virtual location)
-Physical Attendance Required	No Physical Attendance Required
-Geographical Barriers	No Geographical Barriers
-Less Economically Feasible	More Economically
-Instructor Controlled Learning	Learner Controlled -Self Paced
-Time is constant and Learning is variable	Time and Learning both are variable
-Physical Facilities (Instructor, Learner, Books)	Network Facilities (Computer System)
-Telling (Instructors role is of Content Presenter)	Interactivity (Instructors is Co-learner)

-Synchronous Learning	Synchronous or Asynchronous learning
-Learning through Paper	Learning Online
-No repetition of content	Content can be repeated
-Consistency not assured in delivering messages	Consistency (Uniformity of Content)
-Cycle Time (contents in fixed period of time)	Real Time (Continuous learning)
-More Learning Time Needed	Decreased Learning Time
-Learners are enrolled with one institution	Learners with more than one institution
-Individual	Organization
-Training Management	Knowledge Management

Challenges to ICT in classroom

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 faceto face conversation and thus the transactional distance is increased.
4. As all teachers are not 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. Technical difficulties, operator error, communication gap, high cost for using telephone lines and Internet service providers to access Internet services.
7. Lack of robustness of Internet bandwidth to support the desired level of multimedia.
8. Lack of vision about changing role of instructor in E-Learning Environment and acquiring new teaching styles.
9. There is a lack of coherent policy and holistic approach for E-Learning among different organizations. So, there is a need to have a common vision about E-Learning practices.
10. To achieve coherence across E-Learning practices, adequate funding presents the leading challenge to support instructor's technology use in class.

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