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A Study Of Ict In Education: An Indian Prospective

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ABSTRACT:

Information and ***Communication Technology (ICT) in education*** *is the mode of* ***education*** *that use information and communications technology to support, enhance, and optimize the delivery of information. Worldwide research has shown that* ***ICT*** *can lead to an improved student learning and better* ***teaching*** *methods.*

Now, the education system seems to follow its use in delivering and managing the education in a need-based way. There is an up surge of computer and Internet connections in schools. Almost every university will be creating its own network and will be under a single net in the coming future. Certainly, these efforts will make the education in a cost-effective manner. Further, creation of the collaborative teaching and learning environment is essential so that the dropout rate remains low and the requirement of increasing number of learners and teaching load can reach a resolution by ICT means. The present paper discusses the education scenario, the upcoming efforts in the ICT developments and need of the collaborative environment for success of education in India

India has been trying to uphold the status of education for many years. However, due to poor educational infrastructure, social segregation, and nonconductive economic conditions, maximum learners are deprived of education. India has a large number of students from primary to higher levels. Only around 40 percent can improve to gain their higher studies after completing their primary or middle level education. Due to the convergence, electronic-informational environment has been emerging at a very fast rate. Now, the education system seems to follow its use in delivering and managing the education in a need-based way. There is an up surge of computer and Internet connections in schools. Almost every university will be creating its own network and will be under a single net in the coming future. Certainly, these efforts will make the education in a cost-effective manner. Further, creation of the collaborative teaching and learning environment is essential so that the dropout rate remains low and the requirement of increasing number of learners and teaching load can reach a resolution by ICT means. The present paper discusses the education scenario, the upcoming efforts in the ICT developments and need of the collaborative environment for success of education in India.

KEYWORDS: ICT, Education, India Education, Teaching Methods,

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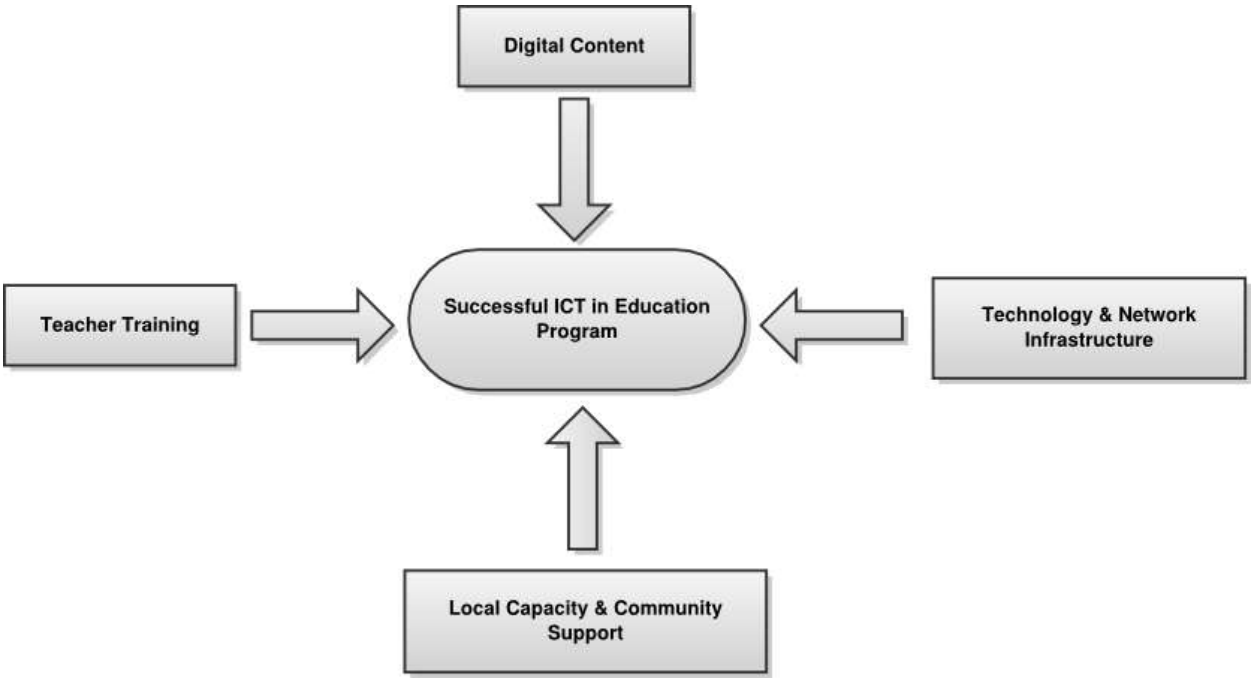
INTRODUCTION

India has the third largest group of scientists and technicians in the world and is predicted to be the world's largest supplier of university graduates by 2020.2 I as we move into the 21st century, these factors and many others are bringing strong forces to bear on the adoption of ICTs in education in general and higher education in particular. It is only through education and the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change.

ICT can be used as a tool in the process of education in the following ways:



1. **Informative tool:** It provides vast amount of data in various formats such as audio, video, documents. **2. Situating tool:** It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.

3. Constructive tool: To manipulate the data and generate analysis.

4. Communicative tool: It can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004).

Indian has twenty-eight states and seven Union Territories (UTs) that cover a population of 1.065 billion. The total literacy rate has increased to 65.8 percent. India has the second largest elementary education system in the world, having an intake around 1.5 million children of the age group 6-14. There are 324 universities, 16,000 colleges for higher education enrolling about 9.28 million people. Thus, India has a large number of students from primary to higher levels (www.education.nic.in).

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Education. After completing the primary or middle level education, around 40 percent learners fail to seek a higher education. The applications of amalgamation of ICTs will have far-reaching implications in shaping the society. Due to this convergence, electronic-informational environments are emerging at a very fast rate. The education system seems to follow its use in delivering and managing the education in a need-based way. Further, excellent efforts are in progress in telecommunication services for creating and accelerating the open and collaborative learning environment. Thus, a new educational scenario is emerging by applying and executing ICT services. Hence, the definitions of formal and non-formal education systems are somewhat being diluted, and existence of an ICT-based education services are emerging. To elevate its status by analyzing some points, viz. education scenario, emerging ICT efforts, challenges and outcomes, respective issues emerged and discussions and conclusions have been made, as we will see in the following sections.

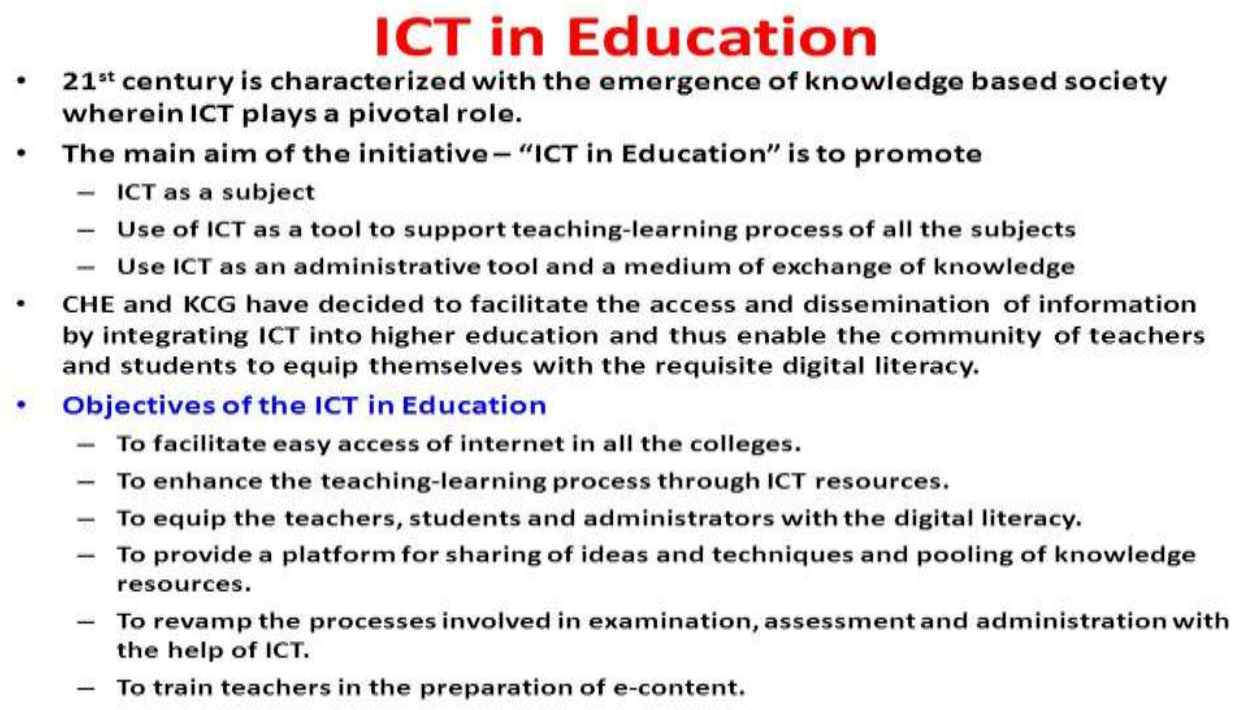
Literature of Review

Brende (2018) "The advent of the Fourth Industrial Revolution can help India leapfrog traditional phases of development and accelerate its transition to a developed nation. Deploying these technologies optimally and strategically can create a potent mix of resources and infrastructure that can yield better quality, more sustainable growth. With more than 50% of its population under the age of 27, India's role is also going to be pivotal in shaping the global 'Fourth Industrial Revolution' agenda in a responsible, scalable and inclusive manner. **OECD, (2010)** "In the long run, innovation and employment creation go hand in hand, contributing to an inclusive and high-employment economy." **Dutz, (2007)** "Innovation is broadly defined to include 'new to the world' knowledge creation and commercialization as well as 'new to the market' knowledge diffusion and absorption." **(Reddi & Sinha,2004) "**India is a country of grand contradictions. While it is a global leader in the knowledge economy, it is also home to more than half the world's poor and illiterate people, most of whom are women."

In a global context, ICT is increasingly accessible and influential. Therefore, most countries see ICT as a gateway for the raising of educational standards **(Noor-Ul-Amin, 2013).** Today, both developed and developing countries recognize the value of ICT tools for their economic development. Developed countries, The US, for instance, spends more than $10 billion annually in educational technology in public schools **(Brunk, 2008),** while Australia spends approximately AUD$8 billion **(Lane, 2012).** Developing countries, for example India, which has adopted a program aimed at reconstructing the existing system of tertiary and vocational education through the integration of ICT tools to reinforce the acquisition of human capital **(Halewood & Kenny, 2008).** Likewise, Uganda's developmental policy relies strictly on ICT and the use of considerable ICT tools to act as a sufficient driver and enabler to boost the country's economy and education

EDUCATION SCENARIO

If we look into the history, the growth of enrollment in primary, upper primary, secondary, and senior secondary levels have occurred 6, 14, and 20 times during the years 1950-1951 to 2001-2002. An increase of 24 and 12 times in the number in the higher education institutions providing general and professional education, respectively, were recorded and ten times the number in universities has been observed during this period. The government spends approximately 4% of the GNP on education whereas as per the recommendation of National Policy on Education, the aim is to achieve 6%, which seems very far. Several efforts in the past have been **recorded (Bhatt 1998, 2006)** but still more efforts are required. India has around 50% of its population below the age of 25, of which 25% are children. A large number of the children fail to complete their primary level of education. This dropout rate falls in the range of 50-60 percent of the total intake. According to the report of the World Bank, about 60.7 million children of age group 6 to 10 years have joined the schools whereas 30.2 million could not obtain the opportunity. Further, for higher education, only 6% **(Deshmukh 1999)** falling in the age group of 17-24 years was able to enroll. If we analyze the development in the literacy improvements, we find that India had 18.33 percent literacy rate at the time of Independence in 1947; which has now been increased to 65.8 percent. Nevertheless, India still has one-third strength of the non-literate of the world's illiterate mass. This ratio is very high and estimates the figure around 400 million. If we observe globally, we examine that since 1960, students' numbers have increased by 6.5 times until 1995



ICT FOR SUCCESS OF EDUCATION FROM AN INDIAN PERSPECTIVE

Around 0.436 million. The plan to pool the learners' stream right from the beginning, i.e., from the primary school level, the scheme should be very well thought and analyzed to take the benefits of ICT services. The chain of dropouts from primary to higher level can be very well controlled and checked. During the year 1998 (www.education.nic.in), the strength of children in the primary schools was 106 million, and only 39 million students were studying in the middle standard and 23 million at the secondary followed by 6.5 million at the tertiary level. As per the Institute of Applied Manpower Research (IAMR), New Delhi, until 1997 India had approximately 0.6 million primary schools, 0.15 million middle schools and 0.1 million high/higher secondary schools. We also observe that the dropout rate is very high at the primary level. To alleviate the increasing dropout rate, students should have to be positively motivated. By providing the better options available with the ICT aided services, the country can also develop and maintain this affinity. However, if the commitment to fulfill the objectives set for the education systems comes from the learners as well as from the education providers, then success is achievable. This socially and vocationally relevant new mode of learning should enable education to keep high the literacy rate and simultaneously keep the rate of dropouts. We observe that under the influence of ICT, distance education has been taking a considerable lead. Only 12% **(Kishore, 1998)** of the learners were being catered to at the higher education level through distance education providers; nonetheless, with the ICT enabled services, the number of learners is increasing. This mode of learning can also be covered under the net-based learning (**Sj0helle, 2005)** in addition to the conventional system.

The emerging role of ICTs in the Indian Education System

All around the world over the past several years. The two building blocks of an education system are teaching and learning. Teaching, from a more traditional perspective, infers that a person is demonstrating or lecturing a concept. This of course, has some constraints and conditions for both the teacher and the taught. Some of these include the place of learning, the materials taught, gauging students' level of learning proficiency, and monitoring and assessing activities. The teacher's ability to assimilate and impart knowledge in a cohesive manner, so as to prepare students for the next mode of learning, is also of great importance.

With time, the role of a learner and that of a teacher have grown to include many different tasks and subtasks of the teaching and learning processes. The teacher, as per the traditional model, is the single authority to evaluate students' advancement. This model is slowly fading away, however, giving rise to more innovative concepts to facilitate intentional learning.

LEARNER CENTERED APPROACH

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Intentional learning as defined by education theorists Carl Bereiter and Marlene Scardamalia, is a combination of processes that have *learning as a goal* rather than an *incidental outcome*. Intentional learning, as the term denotes, specifies learning with the goal of self-improvement.

For example, these personal cognitive goals may include a learner's desire to accumulate, store and utilize a wide range of knowledge to make reasonably sound choices and facilitate critical thinking and problem-solving abilities.

Nevertheless, the current trend in education is more geared toward learners, and several different internal and external factors that affect learning. One such area is Information and Communication Technology (ICT), which is rapidly growing as a result of technological advancement in recent times.

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

ICT includes numerous different technologies, applications and devices, as well as services. The abundant supply of knowledge is possible due to ICT's significant role in education. The Indian education system favors ICT for promoting education and development and is often backed by policy makers both at the central and state level.

THE EMERGING TREND

The emerging trend is to include computers and distance-learning framework. According to statistics reported by professional services firm Ernst & Young, an average Indian household spends about one-third of its income on children's education. With numerous possibilities of online learning systems and cloud-based virtual classrooms or universities, India is taking advantage of ICT in education.

A long-term goal of the Indian education system is to provide education to remote areas through the use of a combination of ICTs: open-source software, satellite technology, audio-visual systems, broadcast media, digital libraries, local language-mapping interfaces, and so forth. Using ICTs in education has several noticeable benefits, but poses numerous challenges as well. The cost of obtaining, purchasing, installing, operating and maintaining ICTs is quite high. Another challenge is that the integration of ICTs into education is still in its initial stages.

There are other, more practical limitations as well, such as lack of electricity, inadequate maintenance of telephone lines, economic and educational insufficiencies such as poverty, illiteracy, and social discriminations associated with gender, class and caste.

Education systems are often interwoven into the socio-economic fabric of a nation and its communities of people. The chief executive of American testing company Pearson, John Fallon, states that education systems will always have a strong national and local

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identity, shaped by "community, culture and language."

In the era of digitization, technology and knowledge have taken center stage in national and international debates. At the same time, the ICT has become an integral part of nearly all sectors and segments especially linked to the education landscape. Be it teaching, learning and assessment, ICT is crafting the role of future education in India,

The ICT has changed the education scenario in the last few decades by emerging as one of the most efficient tools used in the learning process, both by tutors and learners. Assisting in the growth of ICT learning in the country, several brands are ensuring to create options for educational institutions.

Recognizing the importance of digital literacy in rural India, in 2013 Samsung India launched a Smart Class initiative in collaboration with Navodaya Vidyalaya Samiti. The initiative is available across 500 Jawahar Navodaya Vidyalaya Schools, benefitting over 2.5 lakh students. The brand has imparted training to over 8,000 teachers on interacting technology.

ICT has imparted strength to all organizations. Thus, innovation through ICT has occurred and taken for the developmental works as a necessary tool **(Talera et.al., 1995).** Therefore, developmental issues, which are difficult to analyze and understand particularly in India where diversity exists in many forms, ICT can help significantly, taking into account the fact that ICT itself does forward the solutions. Under the pressure of growing population and increasing demand for ICT enabled information in India, it is required to look for the new generation of technologies that deliver information to a host of potential users including researchers, educators, business groups, and policy makers. Until 1999, India had 75 million televisions in

households with an estimated 362 million TV viewers. Further, estimates report that only 7.1% of the population has a telephone, 2.4% has a mobile, 0.72% has the PC, and only 1.75% of the population has an internet connection (Vikas, 2004). Some years back personal computer market has shown the growth of 70% (**Chandragupta, 2000)** which is ever increasing since then. By March 2000, internet connection holders were only.at 1.2 million; this has now reached around 10 million. Some years back, India had 3.6 PCs per 1000 people as compared to 362 in the US. To increase this ratio, IT task force of the Government of India **(Sesagiri, 2000)** has envisaged raising this ratio to 1 PC per 50 people by the year 2008. India's IT spending is about 0.7 per cent of GDP. Under the operation knowledge (www.nic.in), the government's IT Action Plan envisages - IT for all by 2008. In this connection, the government launched to have an internet facility in all educational institutions in all states. The government also has programs on the anvil to create SMART schools and virtual institutions. More than 1000 pilot projects are under operation by the government for spreading IT among the masses. It has spent about $14.55 billion in these projects. They estimate the success rate at 40%. The initiatives under these projects are like the Vidya Vahini project for providing connectivity to Government Senior Secondary Schools and the Gyan Vahini project to upgrade the IT infrastructure in the higher learning institutions by 2007. Many other initiatives have also been taken such as the Working Group on IT for masses (www.itformasses.nic.in); upgrading the Education and Research Network (ERNET) which connects various universities and regional engineering colleges (RECs) through a high-speed network; enactment of the Information Technology (IT) Act of 2000; the Media Lab Asia project for taking IT to the masses. With these efforts, the internet subscriber base is expected to increase to 35 million by 2007 from the earlier level of seven million. It also envisions generating seven million jobs in the sector by 2008. The Department of IT has also instituted a computer literacy excellence award for schools (www.bhashaindia.com/trivia/trivia.aspx).

Other initiatives such as Gyan Nidhi (www.cdacindia.com), Vidhya Nidhi (www.vidhyanidhi.org.in), and the Indian National Digital Library in Engineering Science and Technology consortium (INDEST) have emerged and they are gaining popularity among the masses. Further, to strengthen the mission to disseminate the education, the government launched EDUSAT, an Indian educational satellite, in the year 2004. This provides audio and video communication facilities. In this effort, 58 institutions have access to SITs by the ISRO and UGC to cover 17 regional centers, 12 academic staff colleges, and about 28 universities. This network will be expanding its services in near future (Sharma, 2005). Very recently, to increase the enrollment in the higher education using ICT, the planning commission for the production of knowledge ware and the creation of new infrastructures had allocated more than 100 billion dollars to this endeavor. Efforts are also taking place from the Consortium for

Educational Communication (CEC) for the distribution of Vyas Higher Education Channel (Kem, 2008) to enhance the reach of the educational communication at the most remote locations. To deliver the knowledge, courseware on higher education using ICT modes, UGC-CEC has 17

Educational Multimedia Research Centres (EMRCs) located in the different parts of the country. Currently, it covers around 50 areas of interest with the help of its 15,000 repository of programs (www.cec-uge.org). Recently, the University Grants Commission has decided to establish "A UGC Network" named as UGCNET to provide a seamless, broadband, scalable nationwide inter university link up and create virtual enhancement of the academic structure. University level UGCNET has also begun to cover all universities under an umbrella. To date about 183 universities are covered under this net.

ICT OVERPOWERING TRADITIONAL METHODS

Technology has brought in major changes in the way education is imparted. Teaching and learning process have evolved from being a one-sided activity to an active process involving exchange of ideas. Indulgence of various creative tools and techniques has made the process a collaborative initiative.

Students in today's classrooms are encouraged to participate actively in the learning process and become active producers of ideas and thoughts. "The students are equipped with the correct knowledge, skill and attitude to take full advantage of all the new opportunities that will be available for them in future," according to Dr Bharti Swami from Vidhy ashram International School (Jodhpur)

ROLE OF CENTRAL GOVERNMENT CENTRAL GOVERNMENT IN PROMOTING ICT

The concept of ICT in schools was initially introduced in December 2004. The Central Government later revised it in 2010 to ensure opportunities for students enrolled at the secondary level of education. Presently, the Central Government has subsumed ICT in schools under Rastriya Madhyamik Shiksha Abhiyan (RMSA), a national drive for secondary education. "Various initiatives have been taken by the Government of India for boosting the use of Education education sector. All e-resources are made available through e-path Shala. Rastriya Avishkar Abhiyan aims at nurturing the spirit of enquiry and creativity in young learners," said Dr Swami. To achieve complete digitization and smart education, the Ministry of Human Development has initiated several new initiatives. The Central Government has answered the calls to the changing dynamics of education, especially to the importance of bringing ICT to the schools and colleges and improving the contour of classroom teaching and learning, says Vaibhav Kapoor, Principal, Ajanta Public School (Gurugram), adding: "Availability of technical advancements namely e-path Shala, Saaransh, Shala Siddhi, Shala Darpan, of NCERT books on mobile app etc. are commendable."

The Central Government initiatives are good in many ways as it permits online submission of data through web portals. "This is more transparent and bogus data can be avoided and Indian education sectors have to do education with quality only in future," said Dr S Sridhar, President, Dr K N Modi, Newai, Rajasthan.

KEY CHALLENGES IN INTEGRATING ICTS IN EDUCATION

Though ICT holds the potential to transform the education system of a country to a great extent, its implementation in terms of developing countries remains a challenge to an extent.

"Training teachers for the use of ever evolving technologies, upgrading their skills continuously and keeping them abreast of the latest developments and best practices is a herculean task," said Dr Swami. Availability of latest hardware and software facility determines the efficient usage of technology and maintaining it in schools involves a lot of financial investments. "The biggest challenge for effective implementation of ICT in the schools is the high expenditure in the installation and running of the tools," said Vaibhav Kapoor, Principal, Ajanta Public School (Gurugram).

CHALLENGES

Technological revolution in information science and ever-growing demands have propelled the need to have the proper and secure management of emerging massive information, by deploying appropriate communication devices that the required information may be delivered in time and space. We can consider three tasks associated with the challenge. Heavy investment will be required to procure these items; this is the first task to meet the challenge in meeting the objectives set for education. Then, the second task is to acquire the required ICT infrastructure and applications. The third, and the most important, task is to create the collaborative environment. This third task is the cumulative stage of the progress on the first tow tasks. For the first case, the government is generating the necessary funds; and, for the second case, educational institutions are running several projects and making MoUs with the industries to procure the ICT infrastructure. The third task will facilitate the synchronous as well as asynchronous mode of teaching and learning processes. A collaborative environment means working together in harmony. This harmony consists of X and Y parameters such that: X is considered as a collaboration in team teaching, and Y is considered as a collaboration in team learning.

CONCLUSION

Utilization of technology for imparting training at various levels is a vital and lively element of the Indian education system. This involves schemes such as *train the trainer workshops* and non-traditional professions such as *content/instructional designers, facilitators and organizers* and others. The growth in the education system is primarily initiated, however, by individuals' passion for learning. When that passion for knowledge is subsequently supported by an

innovative framework of ICTs, as well as prevailing governing policies, the education system has the potential for true and revolutionary change.

Information Communication Technologies (ICT) has been adjudged the best tool to offer its services in a number of ways particularly for education. In the view of increased population and poor educational infrastructure, the current emerging digital scenario can pave the way for better means of education in India. We have noticed significant observations in the integration of the existing technological infrastructure, which will certainly allow the smooth delivery of the ICT services to education. The creation of the collaborative teaching and learning environment is essential so that the dropout rate can be kept low and the requirement of increasing number of learners and teaching load can also be resolved by ICT means. Further developments towards to create the industry and academia interface will strengthen the teaching/learning system and ICT infrastructure. This will also enhance the employable stature of the learner. Therefore, to make out education success, we need ICT applications to widen its scope especially in the rural areas where the majority of the target groups reside. Only then will it fulfill the expectation of a substantially raising in enrolment of the learners by effective deployment of the education channel and the creation of the collaborative learning environment.

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