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A GLIMPSE ON THE CHALLENGES IN IMPLIMENTING I.C.T. IN SCHOOL EDUCATION SYSTEM IN HIMACHAL PRADESH

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Abstract

This paper deals with the role of Information and Communication Technology (ICT) in school education system. ICT is a global phenomenon, and children who are computer literate at an early stage of their lives might deal better with the modern 21st century. A sound knowledge of ICT makes it much easier for children to find and organize information. Many schools have dynamic and vibrant virtual learning methods which gives students access to study materials, skill questions, sample papers and assignments. Some schools even have smart interactive white boards for teaching. Children find it more interesting and become more adept in multimedia presentations when engaging with them in their assignments. The researcher discussed ICT as the need of the hour in Himachal Pradesh to gear up the schools education system and giving more opportunities to children to learn better. The main challenges related to finance, teachers' competency, administrative and social are being discussed in the thematic paper. The requirement of the trained staff, efficient equipments and need of motivation for using ICT in teaching – learning process are properly highlighted.

Key words: ICT, Challenges, School Education, Internet.

1. Introduction

Nowadays, the role of Information and Communication Technology (ICT), especially internet in the education sector plays an important role, especially in the process of empowering the technology into the educational activities. Education sector can be the most effective sector to anticipate and eliminate the negative impact of ICT in the 21st century. Technology (internet) in another side can be the most effective way to increase the student's knowledge. Being aware of the significant role of ICT (internet) in our life, especially in the educational activities, education authorities should be wise enough in implementing the strategies to empower ICT in supporting the teaching and learning process in the classroom. ICT is not just the bloom of the educational activities, but also it will be the secondary option to improve the effective and meaningful educational process. According to Bakshi, A. K., "Information and Communication Technology (ICT) is basically an umbrella term that encompasses all communication technologies such as internet, wireless networks, cell phones, satellite communications, digital television etc. that provide access to information."

According to Kaka, Saverinus (2008) the main purpose of the Strategy for Information and Communication Technology Implementation in Education is to provide the prospects and trends of integrating information and communication technology (ICT) into the general educational activities.

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2. ICT in Education System of India

Information and Communication Technology has permeated in every walk of life affecting the technology fields such as launching satellites, managing businesses across the globe and also enabling social networking. The convergence of computer, communication and content technologies, being known as ICT, has attracted attention of academia, business, government and communities to use it for innovative profitable propositions. Year by year it is becoming simpler to use devices such as desktop palm top, iPod etc. 21st century is characterized with the emergence of knowledge based society wherein ICT plays a pivotal role. The National curriculum framework, 2005 (NCF, 2005) has also highlighted the importance of ICT in school education. With this backdrop, major paradigm shift is imperative in education characterized by imparting instructions, collaborative learning, and multidisciplinary problem-solving and promoting critical thinking skills. Government of India has announced 2010-2020 as the decade of innovation (Survey of Information and Communications Technology). Reasoning and Critical thinking skills are necessary for innovation. Foundation of these skills is laid at school level. It is desirable that affordable ICT tools and techniques should be integrated into classroom instructions right from primary stage so as to enable students develop their requisite skills. Most of the tools, techniques and tutorials are available in Open domain and accessible on web. Further to circular number 7 dated 22 Feb 2010 wherein the NCERT had invited responses from teachers involved in the teaching and learning of Mathematics at the senior secondary stage to acquire the skills for using the World Wide Web, the CBSE and State education boards would like to extend it to all subjects and all classes. At Primary and Upper Primary level, focus may be on simple access to information and trying to compile different views and analyze them to conclude in one's own way. At the Secondary level, gathering and structuring of data and computing to arrive at some reports may be taken up in any subject not necessarily Science and Mathematics. At the Senior Secondary level, when students are so exposed, they will get highly motivated to use ICT tools for taking up complex, multidisciplinary problems such as biochemistry, bioinformatics, environmental science, forensic science, nanotechnology, business intelligence etc. This may necessitate computing tools and techniques of generic nature as well as domain-specific. This is the time when the students and the teachers together will work in global competitive environment. The schools affiliated to the CBSE have been at the forefront of adopting the most modern innovations and practices to ensure there is a continuous enhancement in the overall quality of teaching and learning. The CBSE believes that it must bring the immense benefits of ICT and computing technology to every classroom across its fraternity of affiliated schools to improve academic outcomes of learners and to enhance the productivity of teachers in classrooms. This can be done by encouraging the use of technology in classroom teaching, e-learning and instant assessments which shall also go a long way in supporting its CCE initiative as well. CCE in the right spirit entails periodic assessments which are integrated effectively in the classroom teaching and learning. In fact all assessments must inform teaching and using technology helps to create interest among learners as for example a quiz may be done online as part of formative assessment. Technology can greatly assist teachers in classrooms to teach difficult and abstract subject matter concepts effectively if the right digital instruction materials, supporting technology infrastructure and intensive training is provided to the teachers to support instruction. This may require setting up a classroom equipped with LCD projector and facility for computer mediated instructions. Specifically such classroom must have:

a) A projection or display device

b) An interactive system

c) Computer with UPS System (icbse.com).

Education content mapped to the CBSE curriculum topics covering all major subjects across all grades may be created gradually by

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teachers teaching the content. As a first step in this direction, all CBSE affiliated schools are advised to setup at least one classroom in their schools equipped with technology to enable usage of digital instruction materials in the classroom. Teachers wishing to teach a topic with multimedia resources can take the class to this classroom. Proper advance scheduling may help teachers in their venture. Students may be encouraged to form Creative Computing Club to try out innovative applications without any stress and compulsion. For future, schools can plan to setup every year more such classrooms by building capacity among their own teachers to create enriched electronic resources for each discipline as well as cutting across curricular areas must be a prompt action by schools in this direction. (icbse.com/ict-education).

3. Aspects of ICT in education

According to George (2012), five aspects of the educational use of ICT –

- supporting new pedagogical methods
- accessing remote resources
- enabling collaboration
- extending educational programs and
- developing skills for the workplace

ICT is a global phenomenon and children who are computer literate at an early stage of their lives might deal better with the modern world. A sound knowledge of ICT makes it much easier for children to find and organize information (Jeffels, 2012). ICT is not only the future of our children's education, it is the present and we need to make the investment in ICT now. Our own experience as both a print and digital publisher indicates clearly that technology enhances teaching and learning. Effective use of ICT across the curriculum results in significantly increased levels of pupil engagement which in turn raises levels of attainment, particularly with struggling learners.

4. Need for ICT in School Education System

The school education system basically requires improvement in some aspects for ICT education in schools. These aspects are: teachers, educational administration, technical support specialists, content developers and public – private partnership (Fig. 1).

4.1. Teachers

Teacher professional development should have five foci

a) Skills with particular applications

b) Integration into existing curricula

c) Curricular changes related to the use of IT (including changes in instructional design)

d) Changes in teacher role

e) Underpinning educational theories (Zacks, 2009)

Ideally, these should be addressed in pre-service teacher training and built on and enhanced in-service. In some countries, like Singapore, Malaysia, and the United Kingdom, teaching accreditation requirements include training in ICT use. ICTs are swiftly evolving technologies, however, and so even the most ICT fluent teachers need to continuously upgrade their skills and keep abreast of the latest developments and best practices.

4.2. Education Administration

Administration and leadership plays a key role in ICT integration in education. Many teacher or student initiated ICT projects have been undermined by lack of support from above. For ICT integration programs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education.

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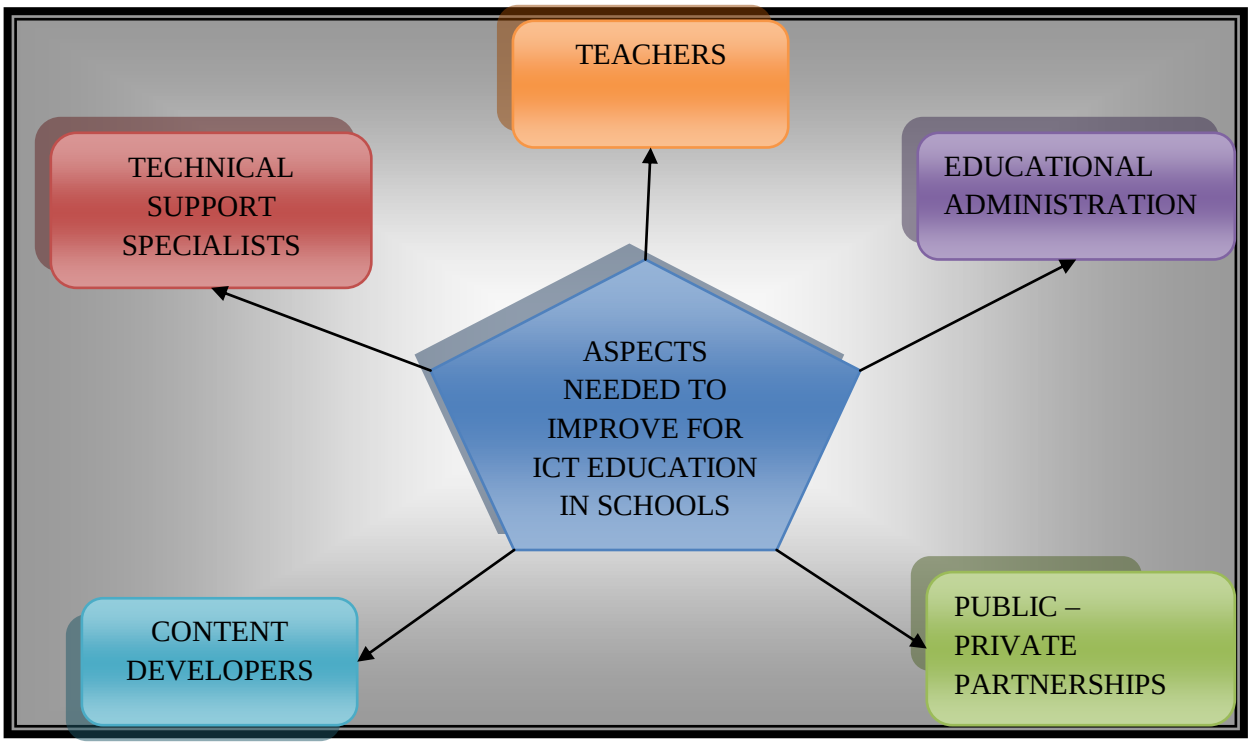

Fig - 1: Aspects needed to improve for ICT education in schools

4.3. Technical Support Specialists

Whether provided by in-school staff or external service providers, or both, technical support specialists are essential to the continued viability of ICT use in a target school. While the technical support requirements of an institution depend ultimately on what and how technology is deployed and used, general competencies that are required would be in the installation, operation, and maintenance of technical equipment (including software), network administration, and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns.

4.4. Content Developers

Content development is a critical area that is too often overlooked. The bulk of existing ICT-based educational material is likely to be in English (see section on language and content below) or of little relevance to education in developing countries (especially at the primary and secondary levels). There is a need to develop original educational content (e.g., radio programs, interactive multimedia learning materials on CD-ROM or DVD, Web-based courses, etc.), adapt existing content, and convert print-based content to digital media. These are tasks for which content development specialists such as instructional designers, scriptwriters, audio and video production specialists, programmers, multimedia course authors, and web-developers are needed. Like technical support specialists, content developers are highly skilled professionals and are not, with the exception of instructional designers, historically employed by primary and secondary schools. Many universities with distance education programs, and those who otherwise make use of ICTs, have dedicated technical support and content development units.

4.5. Public – Private Partnerships

Private sector-public sector partnerships to either pilot or fast track ICT-based projects are a strategy that has gained currency among Ministries of Education in developing countries. These partnerships take many forms, including private sector grants with government counterpart contributions, donations of equipment and education-related content by corporations to state-run schools, and the provision of technical assistance for planning, management, and

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strengthening human resources at the grassroots level. Multilateral organizations and international aid agencies have also driven many of the most significant ICT in education efforts in the developing world (en.wikibooks.org).

5. Importance of ICT in School Education System

ICT in school education system is important. Information and communication technology (ICT) has quickly become one of the basic building blocks of modern 21st century. ICT supports learners but more importantly, it extends the reach of the population in ways we have yet to imagine. Gaining in importance are the following competencies:

- Critical thinking
- Generalist (broad) competencies
- ICT competencies enabling expert work
- Decision-making
- Handling of dynamic situations
- Working as a member of a team
- Communicating effectively

ICT is one of the key skills needed to access and enrich learning of all kinds. It's all about communication, and in the world in which our children are growing up, it is vital: whatever they do, they will have to be ICT-literate. ICT connects all areas of the curriculum. The internet can be a powerful resource; if children aren't connected at home school provision becomes even more important (Carr *et al*., 2012). As per key findings of regional surveys held in Africa (infodev.org) is the importance of fostering an ICT 'ecosystem' with numerous constituent parts working in collaboration to provide opportunities for innovative educational approaches. ICTs can be seen as a platform to overcome the worst parts of education and learning while creating new opportunities and innovative ways to teach and learn. Meeting this demand can take many forms - from distance learning on a radio or TV, to newer devices like the widespread mobile phone. Through it all though, the importance of local context and systematic capacity building is key. Careful monitoring and evaluation, and coordination, are critical to success, (Kelly and Tim, 2010). The following points clearly indicate the importance of ICT in school education:

- Expanding educational opportunities
- Increasing efficiency
- Enhancing quality of learning
- Enriching quality of teaching
- Facilitating skill formation
- Establishing and sustaining lifelong learning
- Improving policy planning and management
- Advancing community linkages (ictinedtoolkit.org)

The importance of using ICT for improving education has been emphasized in the policy framework for over a decade now in India. Numerous initiatives have been started by both public and private entities. Since education basically is a main motor of social change and reform we need to embrace all we have and find more innovative and better ways for information and technology-enabled learning (Team@NextEducation, 2012).

6. Categories of ICT in Education

ICT in education can be broadly categorized in the following ways as:

- ICT as a subject (i.e., computer studies).
- ICT as a tool to support traditional subjects (i.e., computer-based learning, presentation, research).
- ICT as an administrative tool (i.e., education management information systems/EMIS).
- ICT as a medium of knowledge exchange.

The Fig. 2 illustrates the various ICT learning experiences in school education as well as in our life. This clearly shows the influence if ICT in our education system and our daily life also. Etherington (2008) states that e-learning offers great promise as a powerful tool that can be

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integrated into curriculum and instruction to enhance education.

Ertmer (2005) suggests that teachers allow their own pedagogical beliefs to stand in way of their use of ICT.

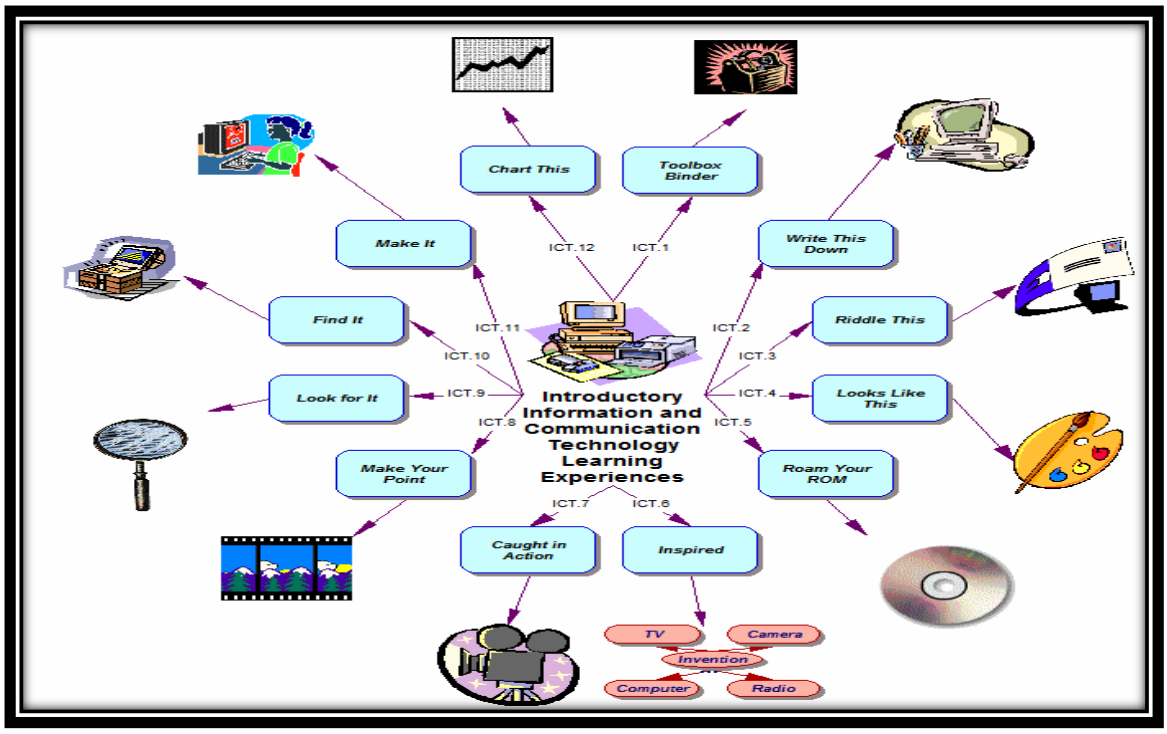

Fig. 2: ICT Learning Experiences (edu.gov.mb.ca)

7. Impact of ICT in School Education

The Internet itself was the first step towards (Satya, 2004) a growing trend to apply ICT based technologies in schools and other educational institutions. Many schools have dynamic and vibrant virtual learning methods which gives students access to study materials, skills questions, sample papers and assignments. Some schools even have smart interactive white boards (ciol.com) for teaching. Children find it more interesting and become more adept in multimedia presentations when engaging with them in their assignments. Quite a percentage (24%) of schools in India use Open Distance Learning. Teachers and students both claim that ICT-enabled learning is more interesting, interactive and keeps students hooked (articles.timesofindia.indiatimes.com). Assignments are also accepted via email in many schools.

One might point out that the vast majority of schools are government-run and only a few privileged, private, international and world schools have much more ample access to ICT. However in recent years even government schools like the Kendriya Vidyalayas and Govt. schools in Himachal Pradesh have been given access to ICT for educational purposes. The importance of using ICT for improving education has been emphasized in the policy framework for over a decade now in India. Numerous initiatives have been started by both public and private entities. One notable example of a public-private partnership is the Intel Education Initiative. India is working towards the broad use of computer-aided learning in such schools through the Intel® Teach Program. The program covers schools associated with the central Government and various state Governments (intel.com).

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8. ICT can do better than bad teachers or no teachers

Sugata Mitra's experiments with ICT/DLR with children with no access to teachers at all are very interesting in this context. The children seem to learn well all by themselves and we need to get a better understanding of how learning happens in such situations, whether this is superficial or not and so on. But that cannot be an excuse to do away with teachers all together. A good teacher can help improve learning substantially even for children who are learning well with the help of DLR and we need good teachers desperately. More importantly, ICT can help democratize the quality of education for all children by bringing the best teachers to the screens in the hands of the students in the form of videos of the best teachers teaching in the native languages of the students.

The Chronicle of Higher Education (chronicle.com) points to LionShare (lionshare.its.psu) - a peer-to-peer file-sharing system will allow teachers/researchers to search their own and one another's digital collections of documents, images, and other material (residing on each other's computers). Unfortunately, despite all the progress made, access to ICT for education in rural areas – usually the less developed areas in India – is much less widespread and beneficiaries are almost always not the poorest or most disadvantaged groups. This is always the case in developing countries. Inadequate schools and teachers, expensive infrastructures, untrained human resources, non-sustainability and ineffective monitoring are some of the reasons behind this. Since, education basically is a main motor of social change and reform we need to embrace all we have and find more innovative and better ways for information and technology-enabled learning. But sadly while doing so we might have to encounter various obstacles. Technology does come with its own 'baggage". I guess it's the price you pay for the life you choose. But, we have to admit it - technology has undeniably made our lives easier (Upadhyay, Anuja, 2012).

9. Challenges for ICT in School Education in Himachal Pradesh

Himachal Pradesh is a purely hill state. The most of the schools are situated in very far flung areas and areas covered with snow in seven to eight months of the year. So, it is very challenging to spread the new technology in education system in those areas. Information Technology education is being imparted in all Govt. Senior Secondary Schools on self finance basis where students had opted for IT education as an optional subject. The department is charging IT fee Rs. 110.00 per month per student. The students of SC (BPL) families are getting 50% fee concession of total fee. About 1,05,000 students are enrolled in IT education subject. (Directorate of Economics and Statistics, 2015). The Himachal Pradesh Government is spending a lot of money on ICT in school education system along with the higher education. In the higher education sector, the National Mission on Education is emphasizing on the role of ICT in increasing the enrolment ratio in higher education. School education in India has a problem of high dropout rate and we need to work on how to decrease this rate. Similarly, in the field of higher education, we need to increase the number of students. Therefore, if we make our learning more engaging with the use of ICT, it can completely change how our education system works. Also, we should examine the challenges of cost-factor and availability of trained teachers in the process of

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dissemination of education with the help of ICT, (Nayak, 2011).

Many researchers agree with the idea that ICT's role is to be a reliable tool to improve the quality of life and this reduces the economic gap between developed and developing countries. Applying ICT to schooling is an urgent task for developing countries to implement (Parliamentary Office of Science and Technology 2006). However, there are challenges that the developing world is facing and these make the 'Digital Divide' continue not only between countries but also within countries (Parliamentary Office of Science and Technology 2006). The hurdles are mainly divided into four categories; a lack of financial resources, poor access to the internet, limited trained teachers, and lack of policy.

9.1. Lack of Financial Resources

The first issue, which almost all developing countries face, is how to deal with the scarcity of financial resources (Oliveira, 1989). Resources in the developing world are always scarce so that they have to be spent mostly on basic supplies such as food, housing and roads. In a sense, investing in ICT for schooling might be regarded as a long term issue which means adopting ICT in the education system is relatively not an urgent issue considering the serious poverty. In Himachal Pradesh schools are situated in remote areas having no connectivity and even no electricity. The HP Government has to establish the schools as per ICT perspective which needs large funds and the State is lacking in this respect.

9.2. Limited Internet Access

Access to the internet is highly limited in remote areas, and relatively poor infrastructure in developing nations such as supply of electricity makes this worse (Gulati, 2008). Low infrastructure is the fundamental problem for developing countries to deal with and it might take a long time and huge funding to improve. In upper Himachal low literacy rates also hinder locals from accessing information through the internet and due to the dominance of English on the internet; non-English speaking local people are isolated from the benefits of using internet (Parliamentary Office of Science and Technology, 2006).

9.3. Lack of Trained Staff

Another challenge of developing nations to adopt ICT in education systems in Himachal Pradesh is a lack of trained teachers. When it comes to practically applying ICT, which is new to traditional teachers, many may not know how to deal with it and sometimes they are reluctant to accept new technologies in their classrooms. Thus, tutors who can train these teachers about new technology and IT professionals who can technically install and maintain the system are needed.

9.4. Lack of Proper Policy

Gulati (2008) argues that inappropriate policy and funding decisions may hinder equal educational development in some developing countries. He also asserts that elitism is the most common driver for improper policy. For example, India focuses mostly on the higher education system so the poor do not have enough opportunities to get adequate education even though there is certain technology-enhanced education such as satellite TV learning programs (Gulati 2008). Pressure from industry might be another source of improper policy (Oliveira 1989). Industry lobbyists distort the policy of ICT and

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education for the purpose of their favour. The Himachal Pradesh has also implementing the policy which will give results later on.

9.5. Lack of Proper Facilities

There are no proper facilities in the hilly areas of the State. The electricity is also facing fluctuations and sometimes not available for many days. So, it is very challenging to promote ICT properly in all schools in Himachal Pradesh.

10. Conclusion

The most fundamental cause seems to have been the deep-seated belief that teaching is an art or at best an imperfect science with no role of technology in the design or delivery of instruction. But, it is observed in this paper that now times have changed and the paradigm of education and learning has changed from art or science to technology-mediated instruction and learning. ICT can, therefore, be perceived as a big change agent for education. India has the third largest system of education in the world, next only to USA and China, (Kumar and Sanjeev, 2012) with more than 500 universities and around 30000 colleges. To introduce ICT-enabled education in such a large system one needs to have high quality multi-media enriched content in different disciplines for various courses including its multilingual conversion, capacity building of teachers and students in ICT skills and state of the art infrastructure along with networking and internet connectivity *via* Virtual Private Network (VPN) / broadband connectivity for disseminating the content and affordable access devices so that it reaches the doorsteps of the learners. The ongoing National Mission on Education through ICT (NMEICT) is a major initiative of the Govt. of India in this direction with an aim to leverage the potential of ICT in providing high quality personalized and interactive content, free of cost, to all the learners. ICT in education is the need of the hour. It has the potential to provide solution too many of the challenges higher education faces today. As per the research observations of Nayak, R., (2011) the common fear that ICT shall replace a teacher is totally unfounded. Realization now seems to be slowly dawning on the teaching community that ICT is primarily to empower them and not to replace them. ICT is, therefore, not to be feared but to be embraced so as to empower our future generations by providing them high quality ICT- enabled education.

The role of ICT in developing countries is significant and critical for their rapid economic success which might lead to closing the gap between the developed and developing world. When implementing the ICT in the education sector, there are considerable challenges such as cost, internet access, training and policy issue. But, each issue has its own ways of addressing which is effective practice around world. However, all these changes for development through applying ICT to the education sector must consider the environment each country faces, because the situation of each nation is totally different from each other. It might be different from region to region within the country and it changes as time goes by. Thus, there is need to take the appropriate steps from the State authorities to promote the role of ICT in the present school education system of the State.

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