

Scope of Innovative Teaching Technologies for Sustainable Development of Education in India

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Abstract

Today, due to the explosion of knowledge in the era of globalization no country can fulfil its educational needs without enhancing the use of innovative teaching technologies. The most important upcoming challenge for any country is: to match the pace of its human resource development together with the pace of global advancement. To achieve a higher growth rate without skilled human resources is nothing less than fiction of imagination. The problem becomes more serious for an over populated country like India, where there is too much scarcity of technological resources to fulfil the needs of all. Thus, the research and development in the field of innovative teaching technologies is the need of the hour for this country. The use of ICT in schools was launched in Dec. 2004 and revised in 2010 to provide opportunities for secondary stage students to mainly build their capacity on ICT skills and to make them able to learn through computer aided learning processes. The study concludes that in India, scarcity of fiscal resources is the main hindrance to modernize the whole education system. The government should provide appropriate financial support to schools and colleges, and should relate the use of information and communication technology with some sort of skill training and development. Such technological education should also be made easily accessible to all aspirant young students no matter whether they are in or out of formal classes by providing them with programmed technological material. Thus, the use of innovative teaching technologies will not only enhance its reach to a greater number of aspiring students but will also be helpful in combating the employment problems through providing skilled human resources for its sustainable development.

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Introduction

In the 21st century, the ever-increasing needs of individuals and society are placing a heavy burden on educational institutions. At the same time, traditional structures and modes of teaching appear less and less responsive to the challenges of this revolutionary time where every day experiences a new advancement in all knowledge fields. Today, the education system worldwide is moving their classrooms from teacher-centric environments focused on information dissemination to 21st century learning spaces where students are empowered, the classroom is flexible, and the focus is on creation, collaboration, and higher order thinking skills. All developed countries are spending millions of dollars to put equipment in the hands of both teachers and students to change class culture, empowering both teachers and students, and ultimately leading to higher levels of student achievement in various specific areas. There is a call for innovation and transformation among educators everywhere. Innovative teaching- learning technologies are benefiting both the teachers as well as students. On one hand it can enable students to grasp concepts more quickly and fully, to connect theory and application more adeptly, and to engage in learning more readily, while on the other hand it is also helpful in improving instructional techniques, leveraging instructor time, and facilitating the widespread sharing of knowledge. This Innovative Educational technology includes numerous types of media such as audio- video tape, TV, Computer, CD-ROM, Internet- Intranet and Web based technologies which can deliver study content in the form of text, audio, images, animation, and video etc. It enhances distance learning through e-learning, i-learning and m-learning to make education easily accessible to all. In today's world development and appropriate uses of information and communication technology is the most significant need for the success of any organization. So it is true in the field of education too, where the use of ICT enables students to learn at their own pace, interest and method. Teachers can use ICT to enhance students' creativity, learning experience, problem solving approach by empowering them to construct knowledge. Now the role of teacher has shifted from knowledge disseminator to

learning facilitator helping students to construct their own understanding. It depicts that use of innovative information technologies in education is very essential for sustainable development of education in India

Present Scenario of Use of Innovative Technologies in India

Innovative Digital learning is an instructional practice that effectively uses technology to strengthen a student's learning experience, emphasizes high-quality instruction to ensure all students reach their full potential to succeed in college and a career and to transform them in high ranked human resource capable for the development of any nation. It includes many different facets, tools, and applications to support and empower teachers and students, including online courses, blended or hybrid learning, or digital content and resources. Making education digital in schools has taken a boom in the field of formal education in India too. "The national policy on education 1986, as modified in 1992, stressed the need to employ education technology to improve the quality of education. The policy statement led to two major centrally sponsored schemes, namely Education Technology(ET)and Computer Literacy and Studies in Schools(CLASS) paving the way for a more comprehensive centrally sponsored scheme – Information and Communication Technology @ Schools in 2004 and revised in 2010 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. This was further highlighted in the National Curriculum Framework (NCF) 2005. Use of ICT for quality improvement also figures in Government of India's flagship program on education, Sarva Shiksha Abhiyan (SSA). Again, ICT has figured comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005."¹In this regard, National Council for Teacher Education (NCTE) has also laid down guidelines about availability of ICT infrastructure in each such training institution. NCTE would prescribe appropriate curriculum in ICT corresponding to the ICT curriculum in schools, to be revised periodically, for such teachers.²

This national policy on Information and Communication Technology was built up with a vision of holistic and sustainable development of education in the country. For this vision policy provides guidelines to assist the States and union territories in optimizing the use of ICT in school education and to establish computer labs on a sustainable basis. "The scheme has essentially four components the first one is the partnership with State Government and Union Territories Administrations for providing computer aided education to Secondary and Higher Secondary Government and Government aided schools.The second is the establishment of smart schools, which shall be technology demonstrators.The third component is teacher related interventions, such as provision for engagement of an exclusive teacher, capacity enhancement of all teachers in ICT and a scheme for national ICT award as a means of motivation.Fourth one relates to the development of e-content, mainly through Central Institute of Education Technologies (CIET), six State Institutes of Education Technologies (SIETs) and five Regional Institutes of Education (RIEs). The scheme currently covers both Government and Government aided Secondary and Higher Secondary Schools. Financial assistance is provided for procurement of computers and peripherals, educational software, training of teachers, development of e-contents, Internet connectivity & set up of smart schools. So far, 87033 government and government aided secondary and higher secondary schools have been approved for coverage under ICT in Schools Scheme. Under this scheme the provision of National Awards for innovative use of ICT in teaching- learning was also introduced for the motivation of Teachers and Teacher Educators."³

Need and significance of the study

Today is the era of digitalization and information and communication technology. Whole world is availing the benefits of technology in all spheres of life, but two areas are the most affected areas i.e. business and education. Our country, India, is also trying to compete in the race of knowledge services. Ours is the country with the most number of youth human resources. The need is to transform this youth force into skilled human resources for sustainable development. This can be done with the use of innovative teaching technologies in formal as well as non- formal forms of education. Nation has already initiated a policy for enhancing the use of Information and Communication Technology in its schools to serve this purpose. It is expected that every school in India should have smart classes to disseminate knowledge in digital form for better retention as well as more coverage in less efforts. The data published by Statista Research Department in January 2020depicts that "with over 560 million internet users, India is placed second in the world, ranked only behind China. By 2021, there will be over 600

million internet users in India.”⁴ Still this use of the internet is not for education purposes. Country is still having a negligible number of schools with smart classes or having well-equipped computer laboratories. The use of ICT in education has now proved to be an indicator of development of any country. The UNESCO survey depicts an unsatisfactory picture for India. UNESCO in its report on ICT uses in school has clearly stated that “In some countries, including India, computers in schools are also often shared with the general community, further limiting pupil access if scheduling is not enacted to prioritise them (India, 2012). To minimise existing shortages, alternative strategies may potentially improve the availability and management of ICT-assisted instruction in schools.”⁵ The survey also envisages that India has ranked 121 out of total 157 countries in ICT uses in schools. This whole picture indicates that there is a scarcity of research in this field in the country. Need is to analyse the basic needs of the country to enhance the uses of innovative teaching technologies in education for sustainable development of human resources in the country. The most needful area for such research is teacher education in India from where trained and skilled teachers are being supplied to the society. These teachers should get most of their training through innovative teaching technologies and should be well equipped with Information and Communication Technological aids. Competency is not achieved by just reading material or viewing pages on a computer display but by providing many opportunities for first hand experiences in the use of ICT laboratories. No one in this rapidly growing knowledge world can now deny the need of innovative technologies in the field of education. This is now the most significant problem to analyse the scope of innovative teaching technologies for sustainable development of education in India, as it is the need of the hour.

Review of Literature

The National Policy on ICT as revised in 2012 stated that “With the convergence of technologies, it has become imperative to take a comprehensive look at all possible information and communication technologies for improving school education in the country. The comprehensive choice of ICT for holistic development of education can be built only on a sound policy. The initiative of ICT Policy in School Education is inspired by the tremendous potential of ICT for enhancing outreach and improving quality of education.”^{1.1}

National Curriculum Framework for Teacher Education (NCFTE, 2009) elaborates the context, concerns and vision underscoring that teacher education and school education have a symbiotic relationship and developments in both these sectors mutually reinforce the concerns necessary for qualitative improvements of the entire spectrum of education including teacher education as well. The new concerns of school curriculum and the expected transactional modalities have been emphasized in designing this Framework for all stages of school education. Issues related to inclusive education, perspectives for equitable and sustainable development, gender perspectives, role of community knowledge in education and ICT in schooling as well as e-learning become the centre-stage in the Framework.^{2.1}

Daniel John, Assistant Director general for Education UNESCO stated in the handbook (2005) for teachers document that “Information and communication technologies must be harnessed to support EFA goals at an affordable cost. They have great potential for knowledge dissemination, effective learning and the development of more efficient education services. This potential will not be realized unless these technologies serve rather than drive the implementation of education strategies. To be effective, especially in developing countries, ICT should be combined with more traditional technologies such as books and radios and be more extensively applied to the training of teachers.”^{8.1}

National Education Policy 2020 has also stated that, “India is a global leader in information and communication technology and in other cutting-edge domains, such as space. The Digital India Campaign is helping to transform the entire nation into a digitally empowered society and knowledge economy. While education will play a critical role in this transformation, technology itself will play an important role in the improvement of educational processes and outcomes; thus, the relationship between technology and education at all levels is bidirectional.”¹¹

The above review of related literature clearly depicts the urgency of this innovation in our education system through appropriate teacher education programs. Therefore, it is essential to study the efforts and impact in the present scenario for sustainable development.

Aim of the Study This is a secondary data-based study focussing on the present scenario against the target of sustainable development goal of education, aiming to study the scope and efforts made for including innovative technology in Indian education to achieve the target of sustainable development goal.

Research Methodology This is a secondary data based analytical thematic research paper, for which a secondary data based qualitative research methodology is being applied.

Analysis and Interpretation In India information and communication technology in schools have been subsumed in Rashtriya Madhyamika Shiksha Abhiyan (RMSA). Now ICT is a component of RMSA. One of the components of this scheme is capacity enhancement of all teachers in ICT. The teachers' curriculum is considered a significant vehicle for the realization of the goal of National Curriculum Framework(NCF)and consequently is designed to provide an enhanced exposure to information and resources for ongoing professional support,improved teaching-learning-evaluation-tracking and increased productivity.⁶In fact,until the teachers training institutes are not well equipped with ICT tools and using them thoroughly during teachers training program, the capacity enhancement of teachers in ICT use may not be possible.The UNESCO estimate for India shows that here are 49 million schools with more than 7 million teachers, 48 Boards 24, 85, 68,702 children in school, and only 96,007 Secondary Schools under ICT@Schools Scheme launched In 2004, with an objective to bridge digital divide, ensure access to students and also develop e-content through dedicated government bodies.⁷ Here arises the need of highly skilled teachers in a very short time span to achieve the target within time. UNESCO's Institute of Statistics (UNESCO, 2015b) has estimated that, globally, 25.8 million extra teachers will need to be recruited by 2030 to meet Education for All (EFA) targets. At present, it is clear that the traditional structures for training teachers cannot keep pace with such expansion.⁸Expanding school systems requires expanding the teacher population with all technological specialist knowledge that a teachers' roles require.

Thus a successful teachers training program is one which develops ICT skills, teaching skills and capacity to face global challenges in the present scenario. Teacher education and teacher-educators will also need to exploit the possibilities of the innovative digital world together with all humanistic values. Modern society needs such technically trained teachers who can make decisions and implement them in a rapidly changing world. Information and communication technologies are becoming the most active part of our daily life, and an active citizen of the world in this 21st century is required to not only understand but fluently use them to make their lives better and comfortable in achieving a lifelong learning, ultimately resulting a more peaceful mind which may think for welfare of mankind in a better and effective manner.The need is to have a blend of innovative learning techniques in our schools as well as in teachers training too. So it is advocated to speed up the practical use of ICT in teachers training with appropriate ratio of theoretical aspects. Slowdown on digital learning would be a terrible idea in this digital era which is facing a knowledge explosion worldwide. Indeed Teacher is the person who interacts with growing aged children and affects their immature minds and his role is being changed from knowledge disseminator to knowledge facilitator. Therefore, on one hand, it is very essential for him to not only understand innovative technologies but regularly use them in teaching endeavour while on the other hand he should also be aware that too much use of technical tools also hinders the valuable interaction which is very much essential for the overall development of children.Thus it can be said that there is no doubt in accepting the scope of innovative teaching technologies for the sustainable development of education in India but one must not ignore the fact that teaching is a human endeavour and it should never lose its essence.

Conclusions The study has drawn the following conclusions:

1. The study also concludes that though there is a vast scope of innovative teaching technologies in education, it should always be humanistic in nature.
2. It also concludes that in the era of knowledge explosion there is no future of such teaching practices which are not based on innovative teaching technologies.
3. In India, scarcity of fiscal resources is also the main hindrance to modernize the whole education system. While the priority should be given to the base requirement i.e. teacher education, but still today,these teacher education institutes are still either not well equipped with innovative technological teaching aids and laboratories or are not using them properly for training of teachers.

4. Teacher trainers themselves are not compulsorily using these technologies to deliver their lectures through innovative methods, so that the trainee teachers could be motivated to do the same practices in their work places i.e. schools.
5. There is no provision for trainees to compulsorily have a laptop before they go for internship, while in various other technical courses students are compulsorily expected to have a laptop for proper practice of learnt techniques. Without practice all technical training is in vain. So the study concludes that all the trainee teachers must have their personal laptop for their appropriate training.
6. The study also concluded that this is the time to analyse the impact of ICT uses on students' learning so that teachers should become aware about the fact that there is no future for such trained teachers who are not skilled in using these innovative technologies for their teaching.

Suggestions

Following are some suggestions of the study:

1. Teachers should use innovative teaching technologies compulsorily in schools and colleges.
2. B.Ed. students should be provided a laptop or a tablet at the time of their admission so that they can adapt digital training efficiently and use it in their internship. In this way not only will they be well trained in the use of ICT but our school children will also be able to get exposure to digital tools.
3. NCTE and NCERT should also provide digital teaching aids to teachers training institutes so that pre-service teachers may use them during their practice teaching and internship.
4. Digital and technological training should also be provided to the teacher educators through workshops organised by NCTE and it should be made compulsory for them.
5. The teachers should be trained effectively not only to produce digital teaching material but also to use innovative methods of teaching-learning to successfully make learning effective.
6. The technological laboratories of training institutes should also be used for the training of in-service teachers in the form of some add-on courses available for those teachers who are not trained in these skills. This should be an essential part of extension services for training colleges.
7. The government should provide appropriate financial support to schools and colleges, and should relate the use of information and communication technology with some sort of skill training and development. Such technological education should also be made easily accessible to all aspirant young students no matter whether they are in or out of formal classes by providing them with programmed technological material. Thus the use of innovative teaching technologies will not only enhance its reach to more number of aspiring students but will also be helpful in combating the employment problems through providing skilled human resources for its sustainable development.
8. In India, research in this direction is not sufficient so researchers should be motivated to do some experimental research and should be provided appropriate financial support too.

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