General Article

ICT initiatives in School Education of India

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Abstract

The 21st Century is known for creating and building knowledge wherein the Information and Communication Technology (ICT) plays the key role. In recent years, ICTs have been evolved as an outcome of globalisation and technological changes at national and international stage. The digital technologies satiate to transform and empower the society through implementing it in different areas. For the purpose, 'Digital India' flagship programme of Government of India was launched in 2015 with the motto of "Power to Empower". The programme aims to transform the country into digitally empowered society & knowledge economy. In addition, the fast pace of ICT development paved the way to utilise these technologies in all fields of education. The vision and pillars of Digital India program enable the ICT initiatives in School education of India. It includes creation, process, storage, display, transmission, exchange, monitoring as well as evaluation of information with the use of technology. It aimed to form a better school education system with access, equity and quality. Thus, the present paper discusses the ICT initiatives for School education in India within the framework of policy perspectives. It also explores the challenges of implementing these initiatives at ground level.

Key Words: ICT, School Education, Digital India, Challenges

Introduction

Innovations in ICT have transformed the way of working of educational institutions. ICT has diverse utilities in education and as such it cannot be limited to 'the transmission of a prescribed set of information from teacher to student over a fixed period of time' (Tinio, 2003). UNESCO (2006) recommends ICTs and their role in contributing to universal access, equity and quality in education. It further emphasized on teachers' professional development, education management, governance and administration. These can be implemented through appropriate blending of policies, technologies and capacities in place. Similarly, the Incheon Declaration (2017) on education accentuates that ICTs need to be harnessed to strengthen

education systems, disseminate & transmit knowledge, access the information, and provide effective and quality teaching & learning.

In addition, ICT use in education is considered as a two-way interaction rather than one-way reception that would make the technology more educational. Also, the National Curriculum Framework (2005) expresses that teachers and students must be treated not merely as consumers of technology but also as active producers.

The ICT innovations and its comprehensive development need to be used in Education. For the purpose, the policies and initiatives with better implementation are required. Since independence, different educational policies have recommended the importance and use of ICT in education. In 1986, the National Policy on Education (NPE) promoted the use of computers in schools. As a result, computer was introduced in Indian schools in 1986. The NPE states that professional education is to be imparted through exposure to computers, training and computer literacy. Hence, the computer literacy studies in schools (CLASS) project was launched in 1984-85 to support computer literacy in schools at that time. However, the NPE (1986), as modified in 1992, stressed the need to employ educational technology to improve the quality of education.

Till the end of 20th century, the ICT component was integrated with the major policies and initiatives. Later, the specific policies and initiatives on ICT in education were launched in 21st century. In 2004, two major centrally sponsored schemes, namely, Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) were merged for a more comprehensive centrally sponsored scheme – ICT @ Schools. The ICT @ school scheme has been subsumed with Rashtriya Madhyamik Shiksha Abhiyan (RMSA). Recently, the Govt. of India has launched an integrated scheme for pre-nursery to Class 12 i.e. Samagra Shiksha under the Union Budget of 2018-19. It is to be noted that Samagra Shiksha subsumes the three flagship schemes of Sarva Shiksha Abhiyan (SSA), RMSA and Teacher Education (TE). Consequently, the above-mentioned ICT @ school scheme is covered under new Samagra Shiksha for improving school effectiveness in terms of equal opportunities for schooling and equitable learning outcomes. ICT @ school scheme aims to provide opportunities to students of secondary schools for capacity building in ICT skills and learn

through computer aided learning process. The Scheme is to bridge the digital divide and socio economic and geographical barriers. It provides support to States/UTs to establish sustainable computer labs in schools. At the same time, Universal Secondary Education report (2005) by the Central Advisory Board of Education (CABE) has figured ICT as an important norm of schooling.

Additionally, the National Policy on ICT (2012) was framed specifically for school education. MHRD has already presented different drafts of this policy, one in 2009, and the revised draft dated 24 Feb. 2011 and the final revised one in 2012. This policy initiative focuses on ICT use in School Education to devise, catalyze, support and sustain ICT. It promotes the ICT enabled activities and processes in order to improve access, quality, and efficiency in the school system. It emphasized that the educational resources need to be prepared in various media forms for widespread availability and extensive use. Thus, the policy promotes digitization of educational resources. ICT can support teachers' capacity building as well as the school system. The implementation of this policy includes the School Management Information Systems (School MIS); digital repositories of tools, content and resources; professional development and continuing education platforms; and guidance, counselling and other student support services.

Moreover, the Curricula for ICT in Education emphasised on the core educational purposes with broad exposure to technologies aimed at enhancing creativity and imagination of the learners. The e-content developed under ICT curriculum should be available in various regional languages because it is the best way of understanding and articulation. Hence, NMEICT (2012) recommended that the e-content being developed for learners from pre-primary to Class 12 would also need to be made available in various regional languages.

In 2015, The Ministry of Electronics & Information Technology, Government of India, initiated the 'Digital India' program 'with a vision to transform India into a digitally empowered society and knowledge economy.' This flagship program covers many initiatives related to infrastructure, Governance & services and empowerment. It envisages to prepare future India through Indian Talent and Information Technology. It makes technology central, enabling change through this umbrella mission covering various departments, schemes and

ideas with efforts of synchronized implementation. Digital India program is focused on nine pillars of broadband highways, universal access to phones, public internet access programme, e-Governance, and e-Kranti. It promotes electronic delivery of services, information for all, electronics manufacturing, IT for Jobs, and early harvest programmes. The ICT initiatives in school education are linked with these pillars. It supports for better implementation of these initiatives. Similarly, use of ICT for access and quality improvement has also been emphasised in Government of India's latest flagship programme on education 'Samagra Shiksha Abhiyan' (2018) with the moto of "Sabko Shiksha Achhi Shiksha". Under this, various digital initiatives have been submerged which are presented further.

ICT initiatives in School Education

ICT includes technologies of transmission such as radio and television, modern communication and networking tools like cellular phones, computer and network, hardware and software, satellite systems and so on. It covers various services and applications associated with the tools, such as videoconferencing, social networking, collaboration etc. Thus, ICT is encompassed with knowledge, comprehension and application part of education. Further, it can also be classified in terms of various technologies as part of creation, processing, storage, display, transmission, exchange, and assessment as well as evaluation of information.

Under ICT initiatives for School Education, various ICT tools and technologies are being implemented for delivering the best practices in schools of India. These initiatives can be classified in accordance with its objective/s such as improve access & services, data management, dissemination of resources, enhance quality of teaching & learning, and monitoring and evaluation. Overall, the ICT initiatives in school education is proposed for improving access, equity and quality of education. The initiatives under the discussed sub-headings are presented below:

1. Improve access and services

Geographic Information System (GIS) Mapping of Schools: For ensuring universal access within a reasonable distance of any habitation and without any discrimination,

the GIS web enabled platform was developed. It is proposed for seamless visualization of school locations across the country (Spatial and Non-Spatial). It has added value to the quality of planning and better utilization of resources available under different schemes.

2. Data Management

Shala Darpan: This School Automation Application is a single Integrated platform to provide School Management Systems' services to Students, Parents and Communities including school profile management, report cards, curriculum tracking system, SMS alerts for parents / administrators on students and teacher attendance, employee information, student attendance and, leave management.

Shaala Kosh: It is a repository of data related to schools which aims to integrate different databases existing at central or state levels to cater to data requirements of all stakeholders in the education ecosystem. It has enabled data consolidation, analysis and usage thereby capturing entire data value chain to empower teachers, headmasters, and administrators at block, district, state and central level for undertaking data decision making.

Student Data Management & Information System: Aadhaar based Direct Benefit Transfer (DBT) is a major governance reform initiative of the Government to ensure targeted delivery of benefits and services to the students. It enhanced the transparency and accountability with the services provided to the students.

Aadhar Database of Teachers and Students: Under UDISE, National Institute of Educational Planning & Administration (NIEPA) is capturing the data of teachers and students including their Aadhar etc. Aadhar enrolment of school going children in the age group of 5 to 18 years in the country would help in tracking of children so that they do not drop-out from school and also for monitoring their academic progress and for ensuring benefits to be disbursed to them in cash or kind under various schemes.

3. Dissemination of resources

E-pathshala: Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) has designed and developed 'E-Pathshala' to showcase and disseminate 'all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through web portal and mobile app'. It is an effort to solve the challenges of digital divide and improve accessibility by offering quality content anytime anywhere.

National Repository of Open Educational Resources (NROER): CIET, NCERT is organising and monitoring the NROER. It is an initiative of MHRD which is a collaborative effort to develop a repository of multimedia resources for teaching and learning purposes. Both online and offline platforms have been designed. Different formats of Resources such as Audio, Video, Image, Document, Interactive, Books including flip books, and multimedia are available on NROER platform.

SWAYAM Platform: MHRD, Govt. of India has launched a Massive Open Online Courses (MOOCs) platform popularly known as SWAYAM (Study Webs of Active learning for Young Aspiring Minds). The portal is offering various online courses through educational institutes for school education and higher education. CIET has also launched courses related to school education.

SWAYAM Prabha DTH-TV Channels: MHRD, Govt of India has developed a learning plan for utilization of satellite communication technologies for transmission of educational e-contents through 32 National Channels i.e. SWAYAM Prabha DTH-TV Channels. These DTH Channels covers the curriculum-based course content of higher education. In addition, the programmes related to secondary and senior secondary school students and teachers are also included in the channels. Besides, life-long learning and preparation for professional courses with competitive exams are also disseminated through these 32 SWAYAM Prabha Channels. SWAYAM Prabha Channel # 31 i.e. Kishore Manch is coordinated by CIET, NCERT which proposed to disseminate content for secondary and senior secondary students as well as teachers.

ShaGun portal – A web portal called ShaGun comprising 'Shaala and Gunvatta'. It is a repository of good practices, photographs, videos, studies, newspaper articles etc on elementary education. These resources are developed by various states and UTs. Its purpose is to showcase success stories and also to provide a platform for all stakeholders to learn from each other.

I-share for India: This initiative was announced in 2015 for developing educational resources for schools and teacher education. Under the initiative, MHRD has invited the educational stakeholders to contribute digital enabled resources for school education and teacher education. It can be contributed in the form of mobile app or web-based ICT platforms.

4. Enhance quality of teaching & learning

ICT in Education Curriculum for School System: ICT curriculum for teachers and students has been developed. NCERT has launched a revised Information and Communication Technology (ICT) curriculum for schools across India which focuses on integrating ICT tools as part of pedagogy instead of teaching computer as a separate subject. Zia (2017) reported that the syllabus is revised on the basis of recommendations of National Curriculum Framework (2005) and the Digital India campaign. Students' curriculum was piloted in 588 Navodaya Vidyalayas for one year. Different states have initiated the efforts to develop draft curriculum and to implement it in their respective states with the help of NCERT's content. A course portal on MOODLE platform has been created for the country as well.

Diksha Portal: MHRD launched Diksha Portal for providing digital platform to teachers, making them more digital. It will serve as National Digital Infrastructure for Teachers enabling to equip them with advanced digital technology. Also, it will enable, accelerate and amplify solutions in the realm of teacher education by providing a platform to learn and train themselves. The portal envisages to help teachers boost their teaching skills and create their own separate profile with their skills and knowledge. Overall, it would help in improving quality of education with use of latest technologies in education.

Project e-Prajna, e-Classrooms, and Digital Language Lab for Kendriya Vidyalayas: Under these schemes, Students of Kendriya Vidyalayas (KVs) have been given Touch Tablets, pre-loaded with e-Contents of Mathematics and Science Subjects to use it for classroom transaction. It proposed to promote flip-learning, reduce school bag burden, learning at own pace and effective assessment. In addition, 9711 e-Classrooms have been established and 2300 e-Classrooms are being delivered to promote blended learning, accelerated learning & better understanding of concepts and effective assessment. Moreover, teachers have been trained for capacity building.

Digital Language Labs have been established in KVs across the Country to improve spoken skills of students in English Language with having 30 user capacity in each lab. These Labs are equipped with Desktop Computers, Language Lab Software, Modular Work Stations and Arm Chairs.

Shaala Sarathi: Shaala Sarathi is a portal to facilitate and link Corporate Social Responsibilities (CSRs), States, UTs and Non-Governmental Organisations (NGOs). It enabled the partners for identifying and scaling innovative programmes under education reform initiatives. It endeavours to streamline engagement and create transparency around external stakeholders wanting to partner with states for improving quality of school education.

5. Monitoring and Evaluation

Saransh: In 2015, the Central Board of Secondary Education (CBSE) have launched a decision support system i.e. ‘Saransh’ with a vision to "Improve children’s education by enhancing interaction between schools as well as parents and providing data driven decision support system to assist them in taking best decisions for their children’s future". It is also available in the form of mobile application for easy access. The app is focused on to review the results at school, state and national level by students as well as parents. This initiative was awarded as 'Best Government Initiative in Education' at e-India 2015 (MHRD, 2016).

Shaala Sidhdhi: ‘Shala Sidhhi’ is developed by National University of Educational Planning and Administration (NUEPA) which is also known as ‘National Programme on School

Standards and Evaluation (NPSSE)'. It is a platform for school evaluation aiming to 'enable schools to evaluate their performance in a more focused and strategic manner and facilitate them to make professional judgments for improvement' (MHRD, 2016).

ShaGun Portal: Apart from repository, ShaGun is an online monitoring portal of the elementary education implemented by States and UTs. The data is accessed by Government Officers at all levels using their specific passwords. These Reports, along with the success stories in the Repository, create an online platform which can be viewed by officers in the Department, PMO and Niti Aayog etc., to see the status of implementation of elementary education in all States and UTs.

Challenges of implementing ICT initiatives in School Education

India has potential of affordability towards ICT as a tool for education, but there are other challenges which hinder the implementation of above discussed ICT initiatives in School Education. Globally, the information overload is an important challenge in front of teachers. They lack the skills to filter out the relevant information and organise these resources in terms of access, process and using the information (Salehi and Salehi, 2012). Further, Singh (2018) counted the challenges of digital education in a developing society such as, infrastructural hindrances, cultural issue i.e. language and attitude, lack of trained teachers, and technologically challenged parents. However, UNESCO (2017) reported limited access to computers with insufficient ratio of number of computers per student. There are advances of technological innovations, but 'utilizing such advances of digital innovations for emerging markets in under-resourced areas remains a challenging issue' (UNESCO, 2017). Students from rural locations or impoverished communities do not have even basic access to ICT. There are schools which do not even have appropriate classrooms, quality teachers, computers, telecommunication facilities and Internet services. For them, ICT continues to be a distant dream (ICT in School Education Report, 2010).

Apart from above, several other challenges also hinder the proper implementation of ICT initiatives in school education. Inappropriate penetration of ICT into the mainstream, lack of available technologies and its usability hinder the implementation process. Similarly, negative attitude towards ICT as alternative to face-to-face education is also an important

challenge to tackle. Besides, the insufficient time for teachers to get trained with the latest available Technological innovations and their best practices to integrate it in teaching and learning activities are notably the concerns with regard to teachers (Oradini & Saunders, 2008; Goswami, 2014). Additionally, for utilising ICT and making it integral to teaching and learning, time commitment is a crucial part, which is overlooked by the teachers and policy makers. Thus, a lot of time must be put into creating networks, sharing information and finding other people to communicate with.

Conclusion

In terms of policy perspective, the ICT initiatives are relevant and appropriate. Here, it is to be noted that technology under ICT initiatives are not so important, but the important thing is how we use it! The time has come that ICT in education is something which is more than its relevance. It is a necessity of today's education system. It is clearly about methodology not just tools, and it needs to be not about products, it needs to be more about practices. However, the role of teacher is nowhere going to diminish rather, it is going to be supported with digitalized backup. To bridge the access gap, new models of content creation, content delivery, learning management and planning need to be developed and promoted. The monitoring and evaluation system for creating cooperative, life-long and self-learning environment have to be developed. The e-content needs to be developed and translated in regional languages to improve grasp and enhance learning in all spheres of education in the country. Today, the classroom is an interactive world where, the teacher as well as the student are engaged with technology. Because today's young generation is hooked up and plugged, whether it is with text messaging, social networking, video calling or more. It is important that teachers and stakeholders find a way to engage them with the appropriate technology. Technology in the classroom should keep the students stimulated by using the latest and greatest inventions in computers and digital media. With ICT initiatives, India can improve access, process and output of our school education system through following strategic framework implementation with bottom-up approach. Overall, ICT has really improved the educational system across the globe and more has to be explored.

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