COMPUTERS IN SCHOOLS : INITIATIVES IN INDIA

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Abstract: Due to the recent advancements and its scope, computer technology has become an indispensable tool of instruction at virtually all educational levels and in all academic areas. All subject-teachers and students today are expected to use computers in teaching-learning process. In order to integrate computers in education system several initiatives are taken by the policy makers, stake holders, government and non government organizations and agencies in various developed and developing countries across the globe. This paper attempts to overview the initiatives taken by different agencies in the developing country India for implementation of computers in the field of education…..!!!

1. INTRODUCTION

Due to recent advancement in information technology innovations and computer usage, the education system is rapidly transforming. The schools use ICT tools to create, circulate, communicate, record and manage learning experiences and teaching outcomes. The teaching provides technology-supported learning, therefore computer technology has become integral to teaching and learning. Researchers Harris (2000); Kellenberger and Hendricks (2000); and Martin and Ofori-Attah (2005), Bhalla (2013), identified that teachers could use computers for different purposes like, for teaching purposes, administration purposes, and personal purposes. Thus, computers can help educators in designing and promoting the teaching and learning process (Sinko and Lehtinen, 1999; Smeets, Mooij, Bamps, Bartolomé, Lowyck, Redmond, and Steffens, 1999). Regarding the efficacy of the use of computers in these ways, there was a general concurrence that when combined with traditional instruction, the use of computers could increase student learning and produce higher academic achievement in a variety of subject areas than does traditional instruction alone (Sheingold and Hadley, 1993; Means and Olson, 1995; Sivin-Kachala, Bialo and Langford, 1997; Bracewell, Breuleux, Laferriere, Benoit, and Abdous, 1998). Generally, it is accepted that computers have the potential to enhance teaching and learning (Shute and Psotka, 1996; Glennan and Melmed, 1996; Roschelle, Pea, Hoadley, Gordin, and Means, 2000).

Therefore, keeping in view the importance and scope of computers in education, several initiatives are taken by the policy makers, stake holders, government and non government organizations and agencies in various developed and developing countries across the globe, in order to integrate computers in education system.

2. INITIATIVES IN INDIA

This section provides an overview of several initiatives, policies and practices by various government and non-government educational agencies in India for implementation of computers in the field of education.

2.1 THE CONTEXT OF NATIONAL POLICIES ON EDUCATION

2.1.1 **Constitution of India Article 21 A - Right to Education 1950:** "The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine."

2.1.2 **National Policy on Education & Programme of Action 1992** envisaged, "Modern communication technologies have potential to bypass several stages and sequences in process of development encountered in earlier decades."

2.1.3 **Learning without Burden: Report of the National Advisory Committee 1992 (Yashpal Committee Recommendations):** The committee emphasized on the greater use of the electronic media be made for the creation of child-centered social ethos in the country. A regular television programme addressed to students, teachers, parents and possibly called 'Shiksha Darshan' be launched, along the lines of the 'Krishi Darshan'. The content of the B.Ed. programme should be restructured to ensure its relevance to the changing needs of school education and to make it more practicum-centred. Pre-service teacher education programme, being a professional course, has to be a rigorous, thorough and intensive. Therefore, B.Ed. degree courses by correspondence be derecognised.

2.1.4 The **Prime Minister of India Sh. Narendra Modi** in his address to the nation from the Red Fort on 71st Independence Day 15th August 2017: "… We have been striving to bring in the changes through technology. ….In the education sector, we have taken an important step to grant the universities freedom from restrictions to make them the world class universities. …. the government is willing to provide funds up to Rs. 1,000 crores…. We have appealed to them and I am confident that the education institutions of our country will certainly come forward and make it a success…"

2.2 COMPUTERS IN SCHOOLS – THE PHASE OF INITIATION

School computing began in India in the early eighties through sporadic initiatives of a handful of private schools. It gained momentum with a pilot project titled Computer Literacy and Studies in Schools (CLASS) jointly launched by Ministry of Human Resource Development and NCERT in 1984. The objectives of the project, detailed in the report of a National Workshop (NCERT, 1984) were to: provide students with a broad understanding of computers and their uses; familiarize students with the range of computer applications in all walks of human life and the potential of the computer as an information processing tool; de-mystify computers and develop a degree of ease and familiarity with computers which would be conducive to develop individual creativity in identifying and developing applications relevant to the immediate environment of the child.

A social rationale! But then with severe limitations of resources, inadequate training of teachers and with no legitimate place for computing in the school timetable, the computer literacy programme was a spectator sport. CLASS was an assortment of unstructured computer-based activities limited to secondary classes; the instructional use of computer was extremely limited (IEA, 1993).

2.2.1 **Information Technology Action Plan:** The IT Action Plan (1998) adopted by the Government of India took a comprehensive view of computers in school education to create an IT literate and IT skilled society. As a consequence, in the year 2000, the Ministry of Human Resource Development sought the deficiencies in the CLASS project to be rectified in the Revised CLASS Project which

was launched as CLASS 2000. CLASS 2000 has the following three components: Computer literacy in 10,000 schools; Computer-aided learning in 1,000 schools; Computer-based education in 100 Smart Schools will become model centres for others. It is expected that the Smart Schools would make the best use of available computer and communication technology to bring about changes in the content, process and outcome of education. The IT task force made recommendations for introduction of IT in the education sector including schools, following which the central government introduced several schemes like Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to enable purchase of computers by students and teachers at affordable costs.

2.2.2 **National Curriculum Framework for School Education 2000** addresses at length the question of integration of ICT into schooling, acknowledges the pedagogical rationale behind this integration and brings to the fore its manifold implications. With respect to large-scale introduction of ICT in schools, the Framework pleads for - Adequate infrastructure facilities; Children's access to global resources; Professional development opportunity for teachers; Development of appropriate curriculum models and pedagogy that makes the best use of ICT facilities; Availability of appropriate learning materials in support of the curriculum. Soon after, in 2001, NCERT brought out the **Curriculum Guide Syllabus for Information Technology in Schools** within the framework of general education (i.e., upto class ten), based upon the recommendations of the National Curriculum Framework 2000 and Project CLASS 2000. The Curriculum Guide is a comprehensive approach to the use of ICT in schools. It is: an argument for ICT an agent of change, a framework for ICT-extended activities in schools, a case for a spiral curriculum for ICT that can be integrated into general education, a model for approaching ICT competencies within the context of subject areas, an appeal that all teachers be able to handle ICT to facilitate children's learning and guide them on when, how and which ICT resource may enhance the learning process. Based on its curriculum guide and syllabus, NCERT has brought out three volumes, titled Learning with Computers (2002), which are expected to be useful for teacher and children alike. These volumes are not on computers per se. Rather; they are expected to take children through the experience of using the technology in a variety of contexts. Each of these volumes contains graded activities for children, often linked to their curricula, and notes for teachers at the end of every chapter.

2.3 COMPUTERS IN SCHOOLS – LATEST TRENDS

2.3.1 **12th Five Year Plan:** India's this last 5-year plan with mission "Faster, more Inclusive and Sustainable Growth" focuses is on the development of ICT skills among students and teachers. This will be implemented in partnership with the states and private providers, and will be a sub-mission of the National Mission of ICT of MHRD. The MHRD's 12th five year plan document for teacher education "TeachR" pertains to ICT integration in Teacher Education through Learning Management System LMS.

2.3.2 **National Mission in Education through ICT:** To enhance the current enrollment rate in Higher Education, to equip the students with IT skills, for preparing them for jobs in the growing services sector and making them self-learners in the cyber world in order to make them 'Netizens', the central government has launched a scheme called the National Mission in Education through ICT. The scheme is to provide connectivity to all institutions of higher learning to world of knowledge in the cyber space, to leverage the potential of ICT, in providing high quality knowledge modules with right e-contents, to address to the personalized needs of learners, in order to take care of their aspirations. These modules are to be delivered through 'One Stop Education Portal'- "SAKSHAT". The content development task for 'SAKSHAT' is looked after by the Content Advisory Committee

(CAC) for the respective subject, which consists of representatives from educational institutions like IGNOU, Delhi University, Kendriya Vidyalaya Sangthan (KVS), Navodyaya Vidyalaya Sangthan (NVS), National Institute of Open Schooling (NIOS) and National Council for Educational Research and Training (NCERT), NGOs and prominent academicians in the field. For delivering benefits of ICT enabled learning, the national mission would focus on achieving technological breakthrough by not only developing low cost and low power consuming access devices to be made available for free on Education Satellite (EDUSAT) and Direct to Home (DTH) platforms for every subject for every class in various languages to every Indian, but also providing training and empowerment for teachers to effectively use new methods of teaching-learning.

2.3.3 **National Policy on ICT in School Education 2009:** The absence of a national ICT for education policy has led to a proliferation of individualistic, expensive and unreplicable ICT initiatives across several states in India. Consequently, the Department of School Education & Literacy, Ministry of Human Resource Development along with the Global e-Schools and Communities Initiative (GeSCI) has started the process for formulating the National Policy on ICT in School Education which aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and global competitiveness. The ICT Policy mission is to devise, catalyse, support, sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. The policy promotes the universal, equitable, open and free access to ICT enabled tools and resources to all students and teachers. It also promotes networking, research, evaluation and experimentation in ICT tools and ICT enabled practices to utilise the potentials of ICT in school education. However, considering that India has some 1.2 mn schools with 290 mn students attending school every day; thirty-five state boards and two central boards and a number of educational agencies are involved as stakeholders. Also, to evolve a mechanism to ensure that knowledge, expertise and skills are shared across all states and territories; and building in house capacities to conduct regular updates for ensuring a dynamic and live policy. While the policy is still in the pipeline, some of the salient recommendations include enabling schools and colleges to use ICT in an integration mode, the radio, television and computer; implementing the scheme under the Build-Own-Operate-Transfer (BOOT) model with private sector participation wherein a private organisation or consortium (BOOT provider) is involved to maintain IT infrastructure in schools by designing, building, owning and operating the scheme for a defined period of time and then transferring this ownership across to the public education system. Considering that last mile implement-ability is an issue in education the follow up team should understand how ICT tools address last mile realities. While devising the policy for the use of ICT in school education, there should be uniformity in syllabus as well as synchronization between lectures.

2.3.4 **National Organisations:**

2.3.4.1 In 1961, the Government of India established the National Council of Educational Research and Training (**NCERT**) as an autonomous organization to assist and advise central and state governments in the implementation of their policies for education and teacher preparation. Over the years, the Council has evolved into a unique organization, with its increasing range of activities and its major concern is to integrate ICT into school education. Developing training materials for teachers and syllabus and instructional materials for students form a key part of the Department of Computer Education and Technological Aids (**DCETA**) at NCERT. At the National Centre for Computer Education of the Department the activities are undertaken for holding training/orientation programmes for teachers towards basic ICT skills relevant to school education and to develop the ability to use ICT-based learning materials for the classroom.

2.3.4.2 The Indira Gandhi National Open University (**IGNOU**), established by an Act of Parliament in 1985 with the dual responsibilities of enhancing access and equity to higher education through distance mode and promoting, coordinating and determining standards in open learning. IGNOU makes use of ICT extensively for imparting education. In addition to self-instructional printed materials, the university utilizes Audio/Video programme tapes; tele-conferencing; Gyan Vani (FM Radio); Gyan Darshan (educational TV channels); eGyanKosh (digital learning resources), the national repository on open learning material and integrated with One Stop Portal 'SAKSHAT' of MHRD for use nationwide; computer networks for imparting instructions. At the National level, IGNOU has been designated as the nodal agency to coordinate all activities concerning the utilization of the facilities offered by EDUSAT. EDUSAT or GSAT-3 launched in 2004 by the Indian Space Research Organisation (ISRO) is the first Indian satellite built exclusively to serve the educational sector, to meet the demand for an interactive satellite-based distance education system for the country.

2.3.4.3 The National Council for Teacher Education, since 1973, is an advisory body for the Central and State Governments on all matters pertaining to teacher education. With its main objective to achieve planned and coordinated development of teacher education system throughout the country, it regulates and maintains and Standards in the teacher education system and for matters connected therewith. The mandate given to the NCTE is very broad and covers the whole gamut of teacher education programmes including research and training of persons for equipping them to teach at pre-primary, primary, secondary and senior secondary stages in schools, and non-formal education, part-time education, adult education and distance (correspondence) education courses. NCTE vide revised Regulations 2014, under Government of India Gazette Notification No.346 (F.No. 51-1/2014/NCTE/N&S) addressed the recommendations of the Justice Verma Commission (JVC) appointed by the Government at the instance of the Hon'ble Supreme Court of India. Herein ICT, Yoga Education, Gender and Disability/Inclusive Education are made integral part of each teacher-education curriculum. In order to assimilate technology in pedagogy of teacher education (from NTT to M.Ed.), the TeachR, a ranking and accreditation framework for Teacher Education Institutes TEIs has implemented a mandate for all TEIs to deploy their own cloud based campus management software (CMS) and Learning Management Software (LMS).

2.3.5 **Public Private Partnership:** Public-private partnerships (PPPs) are partnerships between a government organization and private sector companies. While pursuing its policy of tapping educational potential in "Corporate Social Responsibility (CSR)" divisions of major IT corporations, the government has gained rich dividends over the years in the form of empowered teachers and confident students. Private sector is encouraged to invest part of its profit towards philanthropic activities in the education sector by adopting Government schools for improvement of infrastructure and resources like, library, science lab., audio-visual and ICT infrastructure, art workshops, sports facilities, drinking water and toilet facilities, etc. The Public Private Partnership model seems to have emerged as the most successful model for bridging the digital divide in the country; and ICT in education, especially computer-aided learning, is well on its way to achieve its purpose exercising a positive impact on raising learning standards as well as in reducing dropout rates among children in these schools across the country.

2.3.5.1 **Intel India** has been working for the past ten years with various central and state education bodies offering programs in higher education, teacher training, informal education and science promotion, etc. The Intel Teach Program is a professional development program that helps teachers across India, enhance 21st century learning through the effective use of ICT. The Intel Learn Program is

a program for learners, aged 8 to 16, and in underserved communities across India, to promote 21st century learning skills critical for student success in today's knowledge economy: skills such as digital literacy, problem solving, critical thinking and collaboration. The Intel Computer Clubhouse Network is an after-school learning program that enables youth in underserved areas to access cutting-edge technology and become motivated learners.

2.3.5.2 Through Partners in Learning, **Microsoft** is partnering with governments, educators, and local content and curriculum providers to create sustainable educational programs to train teachers and prepare students to succeed in the global economy. The Partners in Learning (PiL) initiative comprises three distinct yet complementary programs: the Partners in Learning Grants; Partners in Learning Fresh Start for Donated PCs; and Partners in Learning School Agreement. In India, Partners in Learning is part of a larger Microsoft-sponsored educational initiative called Project Shiksha, launched by Bill Gates, Microsoft chairman in 2002. India's Partners in Learning initiative, is expected to establish Microsoft IT Academies for Teacher Training in a total of 10 Indian states and implement training and curriculum programs that are expected to reach 80,000 teachers and 3.5 million students during the first five years. Microsoft India also makes its technologies accessible and affordable to educational institutions and students through special licensing programs including licensing Microsoft software at approximately 20% of the market cost; campus-wide site licensing program through easy annual or term based subscriptions; programs like PiL for government schools, MSIS (Microsoft Student Innovation Suite) for government-funded student PC programs, student option for students procuring laptops/PCs etc, further subsidize the cost of licensing Microsoft software.

2.3.5.3 The cooperate companies like Educomp, Edutech, Digital Divide Partners, also foresaw the computer demand in schools and recognized the business potential in computer education in schools. Aptech, NIIT, Zee Education, Satyam Education Services. Sterling Infotech, Bizkool are some of the companies along with a number of internet world-wide-web sites such as classteacher.com, connectschool.com, egurucool.com, classontheweb.com, eduempire.com, etc. They assist academic institutions, companies and government to enhance their performance and optimize their human capital investments by facilitating learning and development. Their educational programs involve comprehensive education infrastructure implementation, teacher training and content development projects.

2.3.5.4 The **Oracle Education Foundation** OEF's web portal ThinkQuest (erstwhile "Think.com"), launched in India in 2004, is a protected, online learning platform that enables teachers to integrate learning projects into their classroom curriculum and students to develop critical 21st century skills, including creativity, communication, teamwork, and technology skills. ThinkQuest currently supports over 146,000 students and teachers in 1,100 schools across the country, including Kendriya Vidyalayas, Navodaya Vidyalayas, DPS, DAV and other schools.

2.3.5.5 The **British Council**, in collaboration with the **Tony Blair Faith Foundation**, in 2009, launched two pilot projects called "Connecting Classrooms" and "Face to Faith" across the country to bring classrooms all over the world together and for students to "get a feel of the world beyond boundaries". The Connecting Classrooms initiative seeks to "build lasting partnerships between schools in the UK and others around the world" while the "Face to Faith" initiative is an "educational programme that engages secondary school students of different faiths across the world in learning directly with, from and about each other". The officials said that while the Connecting Classrooms initiative aims at partnering schools and equipping school heads and teachers with skills in new technologies, the Face to Faith initiative helps the partnering schools in

providing some content-faith to talk about. The projects have already been launched in 15 countries. The schools that have signed up for the projects in Delhi will be provided with video conferencing software and webcams. "By means of video conferencing and an online community, students of different faiths can work together," said Ian Jamison, Face to Faith facilitator. "It is about celebrating diversity."

2.3.5.6 A multinational technology company Google specializes in Internet-related services and products, which include online advertising technologies, search engine, cloud computing, software, and hardware. The google through moodle has also now entered in teacher education and school curriculum through LMS. Moodle developed by Martin Dougiamas is a free and open-source learning management system written in PHP and distributed under the GNU General Public License, is used to create private websites with online courses for educators and trainers to achieve learning goals. The **Moodle** is an education software that offers learning management system LMS to help teachers and trainers create and deliver effective online learning environments used by millions world-wide. A learning management system (LMS) is a software application used to deliver and manage instructional content, teacher's lectures, notes, books, links, assignments, tests, announcements, and typically handles student registration, online course administration, tracking, and assessment of student work.

3. CONCLUSION

Information and Communications Technology (ICT) can impact student learning when schools have the requisite infrastructure, equipments, support and skilled teachers to integrate it into curriculum.

Schools use a diverse set of ICT tools to communicate, create, disseminate, store, and manage information. When teachers are trained to integrate ICT in curriculum, these approaches can lead to enabling students better prepared to deal with ongoing global technological change. In India, being a developing country so many initiatives, mandates, provisioning towards implementation computer technology in education have been taken by the stakeholders and policy makers, and it's still an ongoing process. In order to aim effective use of ICT in teaching and learning, the country's planners must consider the demand and supply equation, the availability and maintenance of requisite infrastructure and hardware-software, the support to teachers and learners, the accessibility to the updates, and the scope for research and innovations in the field.

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