

# Integrating ICT in Teaching Learning Framework in India: Initiatives and Challenges

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## Abstract

Acknowledging education as a tool for social change necessitates incorporating changes in the methods of dissemination of knowledge to synchronise with emerging trends in all sectors of life. According to a World Bank report, disparities in the levels of ICT readiness and use could translate into disparities in level of productivities and hence could influence a country's rate of economic growth. Understanding and leveraging ICT is therefore critical for countries striving for continued social and economic progress. Hence, the necessity for Information and Communication Technology (ICT)-based resources to be embedded in educational systems to facilitate students to be acquainted, familiarised and skilled in such tools and environments. But this is a mammoth task and policies, programmes and initiatives are to be taken for this. This paper discusses some of the initiative and tries to mark out certain key areas which pose a great challenge to all the stake holders in higher education.

[**Keywords:** ICT, Education, Initiatives, Challenges, Teacher, Infrastructure]

**B**roadly, ICT in education can be defined as “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.”<sup>ii</sup> These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephone communication. It should be understood that information and communication or ICT singularly does not generate learning. Rather, it is a tool that can be effectively utilised to enhance, improve and complement learning-skills already in use that is the conventional methods of pedagogy that have been used so long. To increase the effectiveness and efficiency of education in all levels, the computer and the internet has been used, in the recent past, in addition to the already-available and utilised resources of radio and television, in both classroom and distance-mode of education. However, as educational resources, printed texts were and still are the most accessible, both in terms of cheap availability as well as popularity all across the world, and are in no threat of being upstaged, as the book continues to remain the chief and most powerful visual symbol of education.

The Government of India assessed the importance of the ICT intervention in education as early as 1984-85 with the introduction of Computer Literacy and Studies in Schools (CLASS) as a joint venture of the Ministry of Human Resource Development in collaboration with the Department of Electronics, wherein 12000 secondary and senior schools were beneficiaries. This project was later on adopted as a centrally sponsored scheme during the 8<sup>th</sup> Five Year Plan (1993-1998), and beneficiary institutions increased in number and were provided financial assistance for purchase and maintenance of computers, text books as well as provision for computer instructors. The National Policy on Education (NPE), 1986 did not specifically mention the use of ICTs for promoting primary and secondary education, but the 1992 Programme of Action (POA) on NPE stressed the need to improve access to computers in schools. This move was followed by the constitution of the National Task Force on Information Technology and Software Development (IT Task Force), by the Prime Minister in 1998 that introduced certain attractive schemes such as Vidarthi Computer Scheme, Shikshak Computer

Scheme and School Computer Scheme to inspire and initiate both teachers and the taught to make themselves tech-savvy. These schemes were supported by a suitable cache of initiatives such as lowering the cost of PCs, easy instalment bank loans, computer donations by IT companies and other business houses, bulk donations of computers by NRI organizations and individuals, large-volume bargain price imports, multi-lateral funding, etc. Computers and Internet was to be made accessible to schools, polytechnics, colleges, and public hospitals in the country by the year 2003. Though this initiative failed to make a comprehensive impact, yet the concept of SMART Schools attracted the attention of many schools and higher educational institutions such as colleges, universities where the emphasis was not only on Information Technology in Schools, but also on the use of skills and values that will be ultimately beneficial to all stake-holders.

The Sarva Shiksha Abhiyan (SSA) - Education for All Movement is a programme by launched by the Government of India that aims to universalize of elementary education "in a time bound manner", as directed by the 86th amendment to the Constitution of India making free education to children aged 6–14 (estimated to be 205 million in number in 2001) a fundamental right. SSA is being implemented in partnership with State Governments of the country to address the needs of 192 million children in 1.1 million habitations. Beside opening new schools in those habitations without schooling facilities and to strengthening existing school infrastructure through provision of additional class rooms, toilets, drinking water, maintenance grant and school improvement grants, the SSA also provides additional teachers in existing schools with inadequate teacher strength. Capacity-building of existing teachers is also being initiated by extensive training, grants for developing teaching-learning materials including supplementary teaching resources in digitalized form, and strengthening of the academic support structure at a cluster, block and district level. SSA seeks to provide quality elementary education including life and value-education skills. Most importantly, SSA specially focuses on education and empowerment of the girl-child and children with special needs. SSA also seeks to provide computer education to bridge the digital divide.

Among the first ICT resources to be used in India was the radio, where educational programmes started being broadcast as far back in 1937, known as the School Broadcast Project, simultaneously from Delhi, Bombay, Calcutta and Madras. However, due to regional disparity in school curricula, this project was not successful in the long run. However, as Jaminson and McAnany (1978)<sup>ii</sup> stated, the three main strengths of radio are a) improving education quality and relevance, b) lowering educational costs, and c) improving access to educational inputs, particularly to disadvantaged groups. After independence, radio proved to be a major educational resource medium for promoting adult education and community development, beside farm and home-broadcast topics. The University Broadcast Project started in 1965 and the Language Learning Project started in 1979-80 were worthy precursors of the next chain of radio-programmes that were adopted by IGNOU as part of their distance learning, the IGNOU-AIR Broadcast and the IGNOU-AIR Interactive Radio Counselling. In November, 2001, Gyan Vani, an FM Radio channel started functioning as media operatives, with day-to-day programmes contributed by various ministries, educational institutions and NGOs. EDUSAT, the first Indian satellite designed and developed exclusively for serving the educational sector was launched by the Indian Space Research Organisation (ISRO) in September, 2004. This system was primarily for school and college education, but beside the formal sector, it was also supposed to support the non-formal educational sector. Meanwhile, the Information Technology Act 2000 emphasized technical higher education, so that students would get better placement opportunities in the emerging IT sector in India. This also was bolstered by the Science and Technology Policy 2001, that called for the teaching of science at school and college levels.

The launching of INSAT, INSAT-1A and INSAT-1B were important milestones in the promotion and development of ICT in educational sector. The Information Technology Policy 2005 recognized the strategic importance of ICTs as key components of socio-economic development, governance and enhanced service-delivery. Additionally, the policy also called for improvement and spread of education to achieve computer literacy among students. The VISION 2020 programme, initiated by President A.P.J. Abdul Kalam, encompassed a holistic development module that included integrated information technology tools with a sustainable environment-conscious approach to education. The Ministry of Human Resource Development (MHRD) also undertook several long-term strategies to ensure spread, development and optimisation of ICT tools in Indian classrooms, integrating them with traditional frameworks of knowledge-dissemination. In measuring indicators for sustainable information societies, the United Nations Commission for Science and Technology for Development (UNCSTD) for instance, includes experience, skills, and knowledge as critical components in the development of information societies aside from infrastructure.<sup>iii</sup> The University Grants Commission also instituted several schemes, such as the setting up of Network Resource Centres in higher education institutes to encourage universities, colleges, and other learning institutes to promote better incorporation of ICT in curricula to prepare the next generation of citizens for better adaptation in IT environments. State governments have also come forward to inculcate ICT knowledge and skills among students. The Government of West Bengal has initiated a number of projects for computer skill development among students of school and college levels, as part of their vocational education curriculum, along with a broad-based computer awareness and training programme for disadvantaged groups (SC, ST, OBCs, minorities) as part of their social welfare objectives. The Karnataka state government had started a fully-state financed computer education and computer-aided education project for students of classes VIII-X, under the Mahiti Sindhu project, since 2001.

Most recently, the National Mission on Education through Information and Communication Technology (NME-ICT) seeks to holistically change the educational environment of the country by an aggressive campaign to introduce ICT-enabled education in India, by assuring network access to remote corners, development of quality e-content, as well as empowering student-community by providing low-cost tablet PCs, named Akash. This project is one of the most prestigious projects undertaken by MHRD, in collaboration with different IITs, particularly IIT Mumbai, and the telecommunication major, Bharat Sanchar Nigam Limited (BSNL). NME-ICT is not oriented towards school and college/university-level education, but also ambitiously aims at providing more than 50 crore working population with a one-stop solution for all their learning-needs. One of the prime objectives of this mission is effective utilization of intellectual resources, minimizing wastage of time in scouting for opportunities or desired items of knowledge appropriate to the requirement. Addressing the NME-ICT South Zone meeting on December 23rd 2011 through Amrita University's award winning e-learning platform A-VIEW (Amrita Virtual Interactive E-Learning World) from MHRD's New Delhi office, MHRD Additional Secretary, Shri N.K. Sinha, in his Key-note address stated the government of India's objectives of this flagship programme and emphasized that quality content, high-speed connectivity and proper devices are vital to the success of this mission. He highlighted that the support of all educational institutions in the country is necessary to generate quality content, and re-iterated that now learners can avail content free of cost from Sakshat website, [www.sakshat.ac.in](http://www.sakshat.ac.in). Broadband connectivity is being ensured in all institutions under the NME-ICT mission. At present, around 250 Universities have been using 1 Gbps connectivity on optical fibre. Govt. of India has been providing 75 per cent of the total cost to the educational institution to set up connectivity. Hence they only have to invest 25 per cent. He added that the MHRD has ordered BSNL (Bharat Sanchar Nigam Ltd) to deliver Akash tablet while providing connectivity also.

Stressing on the need to complete LAN connectivity work, he pointed out that unless institutions across the country wake up to the necessity of ICT, it would be difficult to allocate funds for them under the 12<sup>th</sup> Plan period. The point that is to be noted in this connection is that the government is taking major initiatives in the implementation of ICT, yet it still recognises the fact that there are still some innate challenges that calls for immediate attention and action. Yet, the silver lining is that some institutions such as the Amrita University with multiple campuses in South India is making vigorous headway in this regard. Currently, a dozen of online programs are being aired through Amrita University's multipurpose e-learning platform A-VIEW. Online Gurukul, a pioneering initiative meant for Arts & Science college students in Kerala is held every Tuesday. National Weekly discussions between Universities are scheduled on Wednesday while 'Ask a Question' is conducted on Thursday. Apart from these, national workshops as part of 'Talk to a Teacher' program are also transmitted through A-VIEW.<sup>iv</sup> Another feature that obviously calls for attention is the address of the Additional Secretary, Shri Sinha, through video-conference, which was a visible proof and symbol of the governmental conviction and initiative on the facilitation of ICT tools to every corner of the country.

However, an overview of the ICT policy initiatives of the Government of India as well as state governments, will reveal that though there have been considerable progress in incorporation and institution of ICT tools in education programmes, there is still a huge abyss between the initial projected progress and hard reality. The policy processes are sometimes too complex and fantastic to be implemented in the existing framework. Often there is a lacuna between the development rhetoric and its translation into practice. The essentially theoretical approach to implementation of this progressive strategy, without taking into account several practical parameters, is the basic error that hinders successful action. This is complemented by the grossly ambiguous and flawed computing in formulation of educational policy and discourse, simply because of a third, very important parameter – the absence of a clear direction and purpose that contributes to the undermining of the effectiveness of all policies dedicated to educational reform and development. The policies should ideally reflect the best interests of all the stakeholders of education such as learners, teachers, educational administrators, policy makers and the multi-cultural community at large, so that all are aware of the issues concerned and are willing to roll into motion the drivers of the mechanism that systematizes ICT enabled education. Beside these foundational-level bottlenecks, other challenges that are encountered in achieving optimised ICT environment in educational institutions are discussed briefly:

- A. *Infrastructure-related*
- B. *Teacher-related*
- C. *Capacity-building related*
- D. *Technical-support related*
- E. *Language and Content-related*
- F. *Sustainability related*
- G. *Equality-related*

### **Infrastructure-related challenge/s**

A pre-requisite for spread and development of ICT tools in the country is a steady telecommunication network in the country. However, there are a number of other site-specific reasons, beside the over-arching national lacuna that impedes optimisation of ICT resources in

Indian classrooms. A number of surveys conducted on utilisation of educational radio and television (Mukhopadhyaya 1993, Basu 1996, CIET 2004, Rout2007 et al)<sup>v</sup> have already thrown into relief some intrinsic infrastructure-related shortcomings such as small-size classrooms, non-availability of continuous electricity, non-availability of television sets, or sometimes even technicians for maintenance. As far as ICT resources are concerned, it is not always non-availability of hardware or software or proper e-content; it may also be poor organisations of resources, sub-standard quality of hardware, inappropriate software or insufficient time and curricular scope to incorporate ICT in the knowledge-dissemination framework.

### **Teacher-related challenge/s**

For successful functioning of ICT in educational scenario, teachers need to accept the major challenge of re-thinking and re-framing their roles and competencies from that of knowledge-generators to knowledge –facilitators, a step that essentially may call for a re-appraisal of the traditional role of teachers in India, where teachers are ‘gurus’, at par with the divine agencies, and beyond questioning. Beside an ethical/spiritual revamping of their roles, on a more pragmatic level, teachers should be competent enough to employ particular applications and be proficient with computers, be confident to integrate ICT into existing curricula, and also essay modifications of traditional educational theories and practices to enable futuristic demands of the emerging global market, that is completely information technology-oriented. A major area of concern is the mindset of certain teachers that ICT implementation may reduce or altogether eliminate the role of teacher-educators in the classrooms by substitution through computers, thereby creating a resistance to the digital revolution in educational technology. However, all these can be taken care of by underpinning the necessity of ICT in educational theories, and holistic training schedules for teachers to equip them and purge the irrational fear and apathy towards technology tools. If mobile phones, thought to exclusively an elitist possession, can come up as a pan-Indian life-tool, then, with proper strategising and sincere policy-implementation, teachers can be convinced to evince keen understanding and positive appreciation of their changed roles.

### **Capacity-building related challenges**

Training teacher-educators for ICT intervention in classrooms needs to recognise a two-pronged imperative, namely pre-service training and in-service orientation and training. The need of the hour is to integrate training for ICT use into pedagogical training, and not simply training them to use ICT tools. Setting up and running a computer or printer is not enough for teachers to be able to initiate, motivate and prepare students for the future. Instead, teachers should be sensitised to their own responsibilities and inspired to go for skill–upgradation as part of capacity-building initiative.

### **Technology support related challenges**

A major obstacle that often poses insurmountable and sudden challenges to the teacher is the lack of proper technical support facilities in educational institutions. Since, teacher-educators are vested with the responsibility of knowledge-dissemination in ICT-enabled teaching-learning, the task of how such technology is deployed, used, how different equipments are to be installed, operated and maintained (including software), network administration and network security need to be deputed to sound professionally skilled technical group/technicians. In fact, teachers often suffer from a fear of equipment break-down or software mal-functioning that deters them from using ICT in classrooms, and often causes inferiority and insecurity issues among teacher-educators.

## **Language and content-related challenges**

According to the 2001 Census report, around 12% people in India speak in English.<sup>vi</sup> After a decade or so, there is no reason to expect any exponential improvement, even though the telecom-revolution in the form of mobile technology has successfully pioneered sms-communication, and may have marginally increased the multi-cultural Indian citizens propensity for English usage. It must be remembered that all said and done, the average Indian student is one who receives training in educational institutions in his/her native language from teachers who too are more comfortable in knowledge-dissemination in the vernacular medium. In stark contrast, English is the dominant language of the internet as well as the major software produced world-wide. Most of the web-based resources are in English. In this regard, it is very important to focus on the need for content-development in regional languages, as well as English that is comprehensible to most Indian students, and not just the urban, English-medium education-receptors/students. There is a pressing need to develop original educational content in the form of radio/television programmes, interactive multimedia learning materials on CD-ROM or DVDs, Web content etc. Naturally, this will enlist the support of a large number of IT-efficient and vernacular-proficient personnel as well, thereby paving the way for the creation of a large job-pool for the youth of the country in the form of instruction designers, script-writers/content-writers, audio and video production specialists, programmers, multimedia course specialists, web developers, as well as technical support specialists. In fact, ICT development in curricular level will create a sizeable opportunity for all these jobs not just in IT- industry but also in academia.

## **Sustainability related challenge/s**

In order to ensure that like many government projects that start with a bang and end with a whimper, chiefly due to paucity of funds and lack of consistent government initiatives, the ICT projects need to be linked to a self-supportive mechanism, whereby the beneficiary institution is empowered through different (indigenous/outside) channels to ensure pursuance of the project with the help of other stake-holders, in collaboration/joint venture, so that even after the initiating agency retracts, the programmes do not face closure/cessation. Multiple financing channels should be worked out for contingency support. An important aspect in this regard is the sustained interests of the stake-holders as well, that goes beyond finances, because in a country such as India, drop-out rates in education are alarming. A sense of alignment with the project needs to be fostered, but only after the stake-holders, students, guardians, teachers, local benefactors, funding agencies, political parties – all are convinced and motivated about the virtues of the issue. Again, in India, policy decisions are also influenced by change of political leadership, and a keen understanding about the processes involved, the corresponding requirements, and necessary harmonization with strategies – finances – implementation need to be ensured. Finally, in an economically-challenged scenario, cost-effectiveness and appropriate technology are two important parameters to be kept in mind. Since, technology changes rapidly, and is hardly cost-friendly, it may so happen that by the time a particular strategy has been implemented, it has already started facing obsolescence in the wider scenario. However, instead of instituting too many rapid-fire changes to keep the project trendy, a deeper introspective study needs to be made as regards the broad-based objectives of the project of ICT inclusion in educational curricula.

All said and done, it should be kept in mind that the use of ICT tools in education should not increase the existing schisms in the dominant social structure of Indian society, namely that between urban and rural India, rich and poor, cosmopolitan, mainland and remote, border areas, male and female, and caste-based divisions. The existing digital divide stands under threat of further debilitation, as recent statistics (DISE 2008-9)<sup>vii</sup> reveal that compared to around 85% of schools with ICT facilities in Delhi-NCR and Chandigarh, there are only 3.59% schools

with ICT tools in neighbouring Uttar Pradesh and a dismal 0.68% in Bihar. Though ICT can, and is used for furthering distance education and informal sector education in India, it must be kept in mind, that without a concerted effort on the part of all stakeholders that may require a massive paradigm-shift in the way in which education is viewed. Treated and handled in India, the ICT revolution will remain a pipe-dream that may, instead of propelling the country forward become a retrogressive one, effective in marginalising the already disadvantaged sections of the Indian populace.

## Notes

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<sup>i</sup> <http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/Guidelines.pdf>

<sup>ii</sup> 'Radio for education and development', [www.getcited.org/pub/101781064](http://www.getcited.org/pub/101781064)

<sup>iii</sup> B.G.Sudha A, S.Ramesh. "Integration of ICT in Education – Need for Competency Enhancement" in Patil, S.S. et al (Eds). *ICT in Education: Recent Trends*. Jaipur, Prateeksha Publications, 2012, p.58

<sup>iv</sup> <http://aview.in/allvents/Join-NME-ICT-mission-and-reap-benefits>.

See also <http://www.sakshat.ac.in/PDF/Missiondocument.pdf>

<sup>v</sup> Ibid.59

<sup>vi</sup> [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_English-speaking\\_population](http://en.wikipedia.org/wiki/List_of_countries_by_English-speaking_population)

<sup>vii</sup> <http://www.dise.in>