

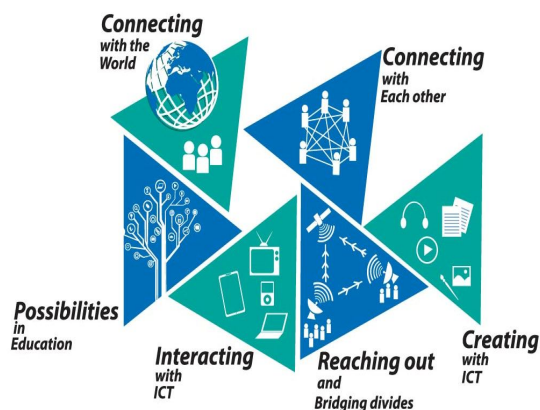
National Conference on Information and Communication Technology in School Education

November 27-29, 2017 at RIE Ajmer

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Basic Role of ICT in School Education:

Information is processed data. Most of the decisions taken in and around the world by and large are based on the data and information. Information is the key guiding force of the world today. For a wider use of the information, the information must be communicated to people. It is only when the information reaches the intended audience, the purpose of creation of information as well as its communication would be served. The information may be created, stored, processed, transmitted, displayed and shared in digital form and through electronic media. The technologies used in these processes are Information and Communication Technologies. Thus, Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system. These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems.



There are various challenges and problems in ICT integration in school education and many conferences and seminars have already elaborated up on it at length. This conference may not be a mere repetition of the same exercise of identifying old and new challenges alone. The Government is aware of most of these challenges and have already initiated many schemes in overcoming these challenges. The focus of conference should be on how the school and teacher education system can harness the true potential of these initiatives and need to provide policy perspectives and recommendations in terms of using current and emerging ICT tools and technologies in improving learning among children and adults of our nation.

One of the major objectives towards the education community is, how ICT can create new, open learning environments? Also, the National Curriculum Framework- 2005, which guides the teaching-learning effort in schools, cautions that technology used as a mere medium to disseminate information tends to bypass the teacher. It expresses a firm belief that teachers and children must be treated not merely as consumers but also as active producers. It is the two-way interactivity rather than one-way reception that would make the technology educational. More than any other previous technology, ICT are providing learners access to vast stores of knowledge beyond the school, as well as with multimedia tools to add to this store of knowledge. ICT are largely instrumental, too, in shifting the emphasis in learning environments from teacher-centred to learner-centred; where teachers move from being the key source of information and transmitter of knowledge to becoming guides for student learning; and where the role of students changes from one of passively receiving information to being actively involved in their own learning. To this end there were several efforts consisting of developing training resources, creating e-content, designing e-learning platforms, creating IT infrastructure and organising training which have been made by Government as well as NGOs.

What follows is a brief discussion about the major Government initiatives to help school integrate ICT in education and reap its benefits for improving learning.

Digital India Programme:

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy.

The Digital India programme is centred on three key vision areas:

- Digital Infrastructure as a Utility to Every Citizen
 - Availability of high speed internet as a core utility for delivery of services to citizens
 - Cradle to grave digital identity that is unique, lifelong, online and authenticable to every citizen
 - Mobile phone & bank account enabling citizen participation in digital & financial space
 - Easy access to a Common Service Centre
 - Shareable private space on a public cloud
 - Safe and secure cyber-space
- Governance & Services on Demand
 - Seamlessly integrated services across departments or jurisdictions
 - Availability of services in real time from online & mobile platforms
 - All citizen entitlements to be portable and available on the cloud
 - Digitally transformed services for improving ease of doing business
 - Making financial transactions electronic & cashless
 - Leveraging Geospatial Information Systems (GIS) for decision support systems & development
- Digital Empowerment of Citizens
 - Universal digital literacy
 - Universally accessible digital resources
 - Availability of digital resources / services in Indian languages
 - Collaborative digital platforms for participative governance
 - Citizens not required to physically submit Govt. documents / certificates

The assumption of the Government is that a well-connected nation is a prerequisite to a well-served nation. Once the remotest of the Indian villagers are digitally connected through broadband and high speed Internet, then delivery of electronic government services to every citizen, targeted social benefits, and financial inclusion can be achieved in reality.

To this end the Government will ensure that all panchayats in the country have high-speed connectivity, the Department of Telecom (DoT) has established Bharat Broadband Network Ltd. (BBNL) to roll out the National Optical Fiber Network (NOFN). BBNL will lay out the optic fibre cable terminating in each of the 2,50,000 gram panchayats in the country, providing 100 Mbps link to be used as information highway by all the stakeholders to ensure that digital inclusion reaches all villages across the country. This will ensure digitization and connectivity of the local institutions, such as panchayat office, **schools**, health centres, libraries, etc. The industry has also come forward to support the e-literacy goal through the National Digital Literacy Mission.

Digital resources are truly universally accessible when they are easily available and navigable everywhere and by everyone. Open resources have the advantage of being widely and inexpensively available and also being widely usable and customizable. Digital resources created or implemented along these lines can be accessed everywhere compared to resources developed

from proprietary systems. Owner departments and agencies have the responsibility of ensuring that their digital resources are of high quality so that access and customization are not problematic.

India has a remarkable diversity in terms of languages written and spoken in different parts of the country. There are 22 official languages and 12 scripts. Knowledge of English is limited to a very small section of the population in the country. The rest often cannot access or comprehend digital resources that are available mainly in English. To overcome this barrier the Government is formulating a new mission mode project named as e-Bhasha to help develop and disseminate digital content in local languages to India's largely non-English speaking population. The disabled friendly content and systems are being developed as per accessibility standards.

Under the Digital India programme, the government is also committed to providing access to digital resources for citizens with special needs, such as those with visual or hearing impairments (which may be partial or complete), learning or cognitive disabilities, physical disabilities which hinder operation of ubiquitous access devices such as phones, tablets and computers (the information under this section “Digital India Programme” is adapted from the “vision areas of digital India” retrieved from <http://digitalindia.gov.in/content/vision-and-vision-areas>)

Other Government ICT Based Initiatives:

National knowledge network: National Knowledge Network (NKN) project is aimed at establishing a strong and robust Indian network which will be capable of providing secure and reliable connectivity. Globally, frontier research and innovation are shifting towards multidisciplinary and collaborative paradigm and require substantial communication and computational power. In India, NKN with its multi-gigabit capability aims to connect all universities, research institutions, libraries, laboratories, healthcare and agricultural institutions across the country to address such paradigm shift.

Website: <http://nkn.gov.in/home>

Swayam: (Study Webs of Active-Learning for Young Aspiring Minds) Platform is indigenously developed by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE) with the help of Microsoft and would be ultimately capable of hosting 2000 courses and 80000 hours of learning: covering school, under-graduate, post-graduate, engineering, law and other professional courses.

The courses hosted on SWAYAM will be in four quadrants, video lecture, specially prepared reading material that can be downloaded/printed, self-assessment tests through tests and quizzes and an online discussion forum for clearing the doubts. Steps have been taken to enrich the learning experience by using audio-video and multi-media and state of the art pedagogy / technology. In order to ensure best quality content are produced and delivered, seven National Coordinators have been appointed: They are NPTEL for engineering, UGC for post-graduation

education, CEC for under-graduate education, NCERT & NIOS for school education, IGNOU for out of the school students and IIMB for management studies.

Website: <https://swayam.gov.in>

NMEICT: The National Mission on Education through Information and Communication Technology (NMEICT) has been envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time any where mode. It is a landmark initiative of the Ministry of Human Resource Development to address all the education and learning related needs of students, teachers and lifelong learners.

Website: <http://www.nmeict.ac.in/#>

National Digital Library of India: Ministry of Human Resource Development under its National Mission on Education through Information and Communication Technology has initiated the National Digital Library (NDL) pilot project to develop a framework of virtual repository of learning resources with a single-window search facility. Filtered and federated searching is employed to facilitate focused searching so that learners can find out the right resource with least effort and in minimum time. NDL is designed to hold content of any language and provides interface support for leading vernacular languages (currently Hindi and Bengali). Learning resources books, article, thesis, manuscripts and AV lectures.

Website: <https://ndl.iitkgp.ac.in/>

NROER: National Repository of Open Educational Resources (NROER) is a collaborative platform, which brings together everyone interested in school and teacher education.

Initiated by the Department of School Education and Literacy, MHRD and managed by CIET, NCERT, offers digital and digitisable resources (audio, video, interactive images and documents) in different languages along with online activities.

Website: <http://nroer.gov.in>

Shala Darpan: KV Shaala Darpan is an e-Governance platform for all Kendriya Vidyalayas in the country. It aims to improve quality of learning, efficiency of school administration, governance of schools & service delivery to key stakeholders namely, students, parents, teachers, community and schools. Parents will get entire information at a united platform about their children in respect of attendance status, performance, health challenges and entire academic record from 1st to XIIth standards. Students will have facilities of e-tutorials and learning aids to enrich their knowledge.

Website: <https://darpan.kvs.gov.in/shaaladarpan/>

Shala Siddhi: The need for effective schools and improving school performance is increasingly felt in the Indian education system to provide quality education for all children. It work on Enabling Resources of School: Availability, Adequacy and Usability, Teaching-learning and Assessment etc. The National Programme on School Standards and Evaluation (NPSSE), known

as Shaala Sidhdhi is a comprehensive instrument for school evaluation leading to school improvement. Developed by the National University of Educational Planning and Administration (NUEPA), it aims to enable schools to evaluate their performance in a more focused and strategic manner and facilitate them to make professional judgments for improvement.

Website: <http://shaalasiddhi.nuepa.org/>

Saransh Portal: A CBSE Initiative, Saransh is a tool for comprehensive self-review and analysis for CBSE affiliated schools and parents. It enables them to analyze students' performance in order to take remedial measures. Saransh brings schools, teachers and parents closer, so that they can monitor the progress of students and help them improve their performance.

Website: <http://saransh.nic.in/?language=en>

E-Pathshala: E-Pathshala has been developed by NCERT for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through website and mobile app. The platform addresses the dual challenge of reaching out to a diverse clientele and bridging the digital divide (geographical, socio-cultural and linguistic), offering comparable quality of e-contents and ensuring its free access at every time and every place.

Website: <http://epathshala.nic.in/>

e-PG Pathshala: High quality, curriculum-based, interactive content in different subjects across all disciplines of social sciences, arts, fine arts & humanities, natural & mathematical sciences, linguistics and languages at PG level is being developed under this initiative named e-PG Pathshala.

Website: <http://epgp.inflibnet.ac.in/>

ONLINE LABS (OLABS): Online Labs (OLabs) for school lab experiments provides students with the ease and convenience of conducting experiments over the internet. It has been developed to supplement the traditional physical labs and bridge the constraints of time and geographical distances. This not only reduces the costs incurred for conducting experiments in real time but gives a student the flexibility to explore and repeat experiments till they are thorough.

Website: <http://www.olabs.edu.in/>

e-BASTA: In line with the Government's Digital India initiative, C-DAC has created a framework to make school books accessible in digital form as e-books to be read and used on tablets and laptops. The main idea is to bring various publishers (free as well as commercial) and schools together on one platform. In addition to the portal, a back-end framework to facilitate the organization and easy management of such resources has been developed, along with the web-based applications that can be installed on tablets for navigating the framework.

Website: <https://www.ebasta.in/>

GIS In School: A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. This is a Web GIS application to enable planning for the access, enrolment, retention, quality and monitoring aspects, integration of school infrastructure, facilities, budget & expenditure, child & teacher information, attendance, mid-day-meal program, results, school complexes along with required visuals, integrating. A proximity analysis helps to meet the norms of the government in establishing the new schools and upgrading the existing schools wherever required.

Website: <http://schoolgis.nic.in/>

Swayam Prabha: Educational Contents through for operationalising 32 Direct to Home (DTH) Television Channels for providing high quality educational content to all teachers, students and citizens across the country interested in lifelong learning. There will be new content of four hours every day, which would be telecast six times a day allowing the student to choose the time of his/her convenience.

Website: <http://www.swayamprabha.gov.in/>

National Policy on ICT In School Education: To devise, catalyse, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. It aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness.

Website: <http://ictschoools.gov.in/Policy/national-policy-ict-school-education-2012>

National ICT Curriculum: National ICT Curriculum aims at realising the goals of the National Policy of ICT in Schools Education and the National Curriculum Framework. Given the dynamic nature of ICT, the curricula, emphasising the core educational purposes, is generic in design and focuses on a broad exposure to technologies, together aimed at enhancing creativity and imagination of the learners.

Website: <http://ictcurriculum.gov.in/>

National Award For Teachers Using ICT For Innovation In Education: Under the ICT in Schools, to promote computer enabled learning and usage of ICT in teaching in Government and Government aided Secondary and Higher Secondary Schools has provision for instituting the

National Award for innovative use of ICT to motivate the Teachers and Teacher Educators for innovative use of ICT in teaching-learning.

Website: http://mhrd.gov.in/ict_awards

About The Conference:

As we know, the Information and Communication Technologies (ICTs) play an increasingly important role in the way we communicate, learn and live. The convergence of recent technologies, web and mobile technologies, provides unique opportunities and an infrastructure for both face to face and online learning environments. All the above said programmes/schemes are aimed at bringing a synergy among all the ICT integration efforts and systematic scaling-up of projects and its sustainability. In this background it is important that the education system needs to harness the potential of these schemes and initiatives in improving the learning and assessment practices in our schools and classrooms.

Therefore, this conference is planned to provide an opportunity for exchanges of national and international initiatives and experience on ICT in school education, spreading information, and making suitable recommendations for policy planners, academic and administrative staff. The conference is expected to focus on a) Exploring innovative use of ICT in teaching-learning-assessment process, b) Use of FOSS tools and OER practices in subject teaching & learning, c) Discuss the use of sophisticated access devices/Ubiquitous Technologies and everywhere learning, d) Exploring efficient management strategies for technology integration initiatives, e) Discuss on more self-directed human resource development approaches using emerging technological possibilities, f) Use of sophisticated assistive technology tools and solutions for Disabled Learners and making classrooms more inclusive based on the principles of universal design for learning, g) Implementing design based research, action research and other applied research in technology integration in education to develop better insight, and h) Exploring means to rewarding and recognizing the performers and showcasing best practices

The Objectives, themes and subthemes are mentioned below:

Objectives of the Conference

- 1) To showcase the innovative practices of ICT integration in School education.
- 2) To provide a discussion forum for improving the quality of the teaching-learning process with ICT based support to school education.
- 3) To explore various current and emerging ICT tools, services, culture of learning (development of learning skills, expansion of optional Education, open source of education, etc.) and discuss the implications of these on school education.
- 4) To explore the ICT based tools for the learners with special needs to integrate themselves within school and society by increasing their independence and by developing their abilities and interests.

- 5) To provide platform for sharing innovative experiments for enhancing efficiency of assessment and administrative practices through ICT integration for School Education.
- 6) To explore various professional development alternatives in enhancing ICT integration competencies.
- 7) To explore the ICT trends in instructional designing and pedagogical practices for school education.
- 8) To discuss the challenges in integrating ICTs in school education and measures to overcome these Challenges.
- 9) To provide an opportunity to share research studies on ICT integration in school education today.

Themes and Sub Themes

Theme 1: Policies and issues related to ICTs in School Education

1. Planning and Analysis of policies on ICT, OER in school education.
2. Universal access to quality content.
3. Technological issues in education (E-Learning, Apps for learning, Mobile learning, phones, tablets)

Theme 2: ICT is Teaching-Learning-Assessment process

4. OER practices in subject teaching & learning.
5. Mathematical fundamentals of ICT and educational change.
6. ICT in assessment and learning
7. ICT and issues in science and other fields of human culture related to ICT education.
8. ICT enhanced language teaching and learning.

Theme 3: Research related to ICT in Schools

9. Research on effective practices of ICT in school education.

Theme 4: ICT in Teacher Professional Development

10. Teacher's professional development of promoting ICT in school education.
11. Technological innovations for teaching in Schools
12. ICT skills and competencies among teachers.

Theme 5: ICT in Innovative Schools, School Governance

13. ICT in Innovative Schools, Impacts and Effective use of ICT for quality learning.
14. Monitoring and evaluation of the impact of ICT on school Education.
15. Beneficial Effects of E-Governance in Schools.
16. ICT for inclusive education.

Expectations of the National Conference

Following presentations on areas is followed with some leading questions, which need to be addressed in the papers and various sessions and discussions to arrive at valid conference recommendations.

ICT is Teaching-Learning-Assessment process

- There is a need for initiatives design to promote integration of ICT with best pedagogical practices so that the teachers would be able to bring new knowledge into schools and can create an impact from the onset. Accordingly, ICT tools should be leveraged to help teachers shift from transferring information to facilitate learners to create knowledge and help them to shift from an acquisition mode of learning to one that engages in higher order thinking, innovation, creativity and collaboration. There are many innovative pedagogical practices like flipped learning, MOOC, PBL, Makerspace, game based learning, and mobile applications. Technology tools like e-portfolio and rubrics can be used productively for authentic assessments. Learning analytics and other developments are promising developments in individualising assessment and providing feedbacks.
- **Questions:** Groups need to work on framework of thinking what? How? and Why? What are the initiatives to shift the pedagogical practices that are predominantly teacher-centric to include more student centric pedagogy practices with the help of ICT tools? How to facilitate self directed learning among students? How to leverage ICT for formative assessment and summative assessment? How to use ICT for providing and engaging students in meaningful and authentic learning experiences? How to plan and implement alternative authentic assessment with the help of technology, which focuses on real world problems? What is preventing our teachers to use innovative pedagogical approaches mentioned above, in the classrooms?

OER practices in subject teaching & learning

- Open Educational Resources (OER) and Creative Common Licenses have been gaining wider acceptability among the educational community. Having realised its potential for improving the educational practice, it is high on the national agenda of many countries and India is not an exception. Many of the Government initiatives including NROER as mentioned in the previous section is developing web-based resources to meet the increasing demand of ICT-enriched teaching and learning environments. The extent of OER creation, use, reuse and adaption is still in its primitive stage in many countries including India. Lack of good quality educational resources in regional languages is another problem in integrating technology in school education. There is a necessity of developing repositories of open educational resources for school education in all subjects in Indian languages.
- **Questions:** The conference could focus on how these resources could be used to enhance learning, what pedagogical practices using these resources can maximize learning and thinking? How can repositories to be used as practice field for teachers in creating content and transfer these content to national repositories after validation?
- Still, there is huge of end users who are not even aware of what is OER let alone where to find it, how to find it, how to use it, and how to create and modify it. How to create this awareness and required skills in using it? Creating a support system which facilitates the creation, use and management of OER is the first stage in harnessing the full potential of OER and the conference need to discuss the possibilities. Creating such support system necessitates a strong national policy guidelines, accessible tools and technologies for

creating and adapting OER, technologies to host and deliver the OER resources, mechanisms to popularise its use and adaption and an institutional culture in which such practices are accounted and rewarded. Deliberations on these issues are of utmost importance.

Free and Open Source Software (FOSS)

- The ICT curriculum states that the use of proprietary software would become very expensive and make the curriculum implementation unviable. Therefore, Free and Open Source software have been suggested throughout the curricula. The use of FOSS applications will also obviate software piracy and enable customisation. There is a necessity of making nationwide effort by central and state Governments in popularizing FOSS among all users. To this end proper policy guideline, training programs needs to be developed and deployed.
- **Questions:** Why people are not shifting towards use FOSS tools? How to popularise use of FOSS tools among teachers and teacher educators? What are the FOSS tools available for school education? Could there be a centralised platform for all FOSS tools which permits downloading, installation trial, feature reviews, tutorials and sharing ideas for effective use in education?

Flipped Learning in School Education:

- Flipped learning is a pedagogical approach in which the conventional notion of classroom-based learning is inverted, so that students are introduced to the learning material before class, with classroom time then being used to deepen understanding through discussion with peers and problem-solving activities facilitated by teachers.

M –Learning or Mobile Learning:

- Education is the procedure by which the understanding, knowledge and skills of one generation are passed on to the next. Today there are two forms of School education: conventional education and distance education. Mobile learning, or "M-Learning", offers modern ways to support learning procedure through mobile devices, such as handheld and tablet computers, MP3 players, smart phones and mobile phones.

MOOC (Massive Open Online Course):

- A massive open online course (MOOC) is a model for delivering learning content online to any person who wants to take a course, with no limit on attendance. the project 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) has been started. SWAYAM provides an integrated MOOC platform and portal for online courses, using information and communication technology (ICT) and covering High School till all higher education subjects and skill sector courses to ensure that every student benefits from learning material through ICT.
- **Questions:** The conference focuses on exploring various issues associated with Flipped learning, M-learning and developing and delivering MOOCS in school subjects etc. How to integrate learning from such initiatives in to the existing context? Could it be used for enrichment or remediation? How to account for the learning from these courses in to the existing assessment contexts? Who will develop and how will it be delivered?

Access Devices

- Teachers and students should be provided with adequate access to hardware and software. Providing adequate infrastructure in terms of computer laboratories, multimedia enabled smart classrooms need to be taken up with priority. Financial support could be made available to students and teachers to bring their own devices and this will help in overcoming one of the major concern of upgrading and maintenance of both hardware and software. The onus of maintenance and up gradation is passed on to the individual users. Also most of the time availability power supply is the major concerns in effective integration of technology.
- **Questions:** The conference can focus on the issues related to allowing students, may be from primary stage onwards their own mobile devices as a part of bring your own device (BYOD). What structural and pedagogical innovations are possible in such a scenario?
- Measures to funding the creation of computer laboratories and smart classrooms and its up gradation and maintenance could be explored. Who should fund this and how the funding should be provided? Can someone from outside should decide what is needed in the school then purchase and dump that in the school or should the school be given more autonomy in deciding their technology requirements? Could they be provided with ICT funds to purchase equipment and develop infrastructure to support customized ICT programmes in their own schools? Could such autonomy bring ownership and accountability? Could they be asked to evaluate and benchmark their ICT practices and institutional arrangements against the established standards? Can we use solar panels and batteries to power the digital devices?

Internet Connectivity for Access Devices:

- As part of the Digital India Initiatives, the Bharat Broadband Network Ltd. (BBNL) will provide 2, 50,000 gram Panchayats with high speed internet connectivity of 100 Mbps to be used as information highway by all the stakeholders to ensure that digital inclusion reaches all villages across the country. This will ensure digitization and connectivity of the local institutions, such as panchayat office, schools, health centres, libraries, etc. In addition with the wide spread access and use of 3G and now popular fourth generation (4G) of mobile communication technology standards will ensure high speed wireless internet access a reality. Under the Digital India programme the Government will ensure universal access to mobile connectivity by providing mobile coverage to around 55,619 villages in the country that do not have mobile coverage.
- **Questions:** The conference should explore in such a scenario, what should be the policy directions in effective utilisation of this internet connectivity to transform the teaching, learning, assessment, and management practices in the schools.

Ubiquitous Technologies and everywhere learning

- Coupled with high speed broad band internet and Wi-Fi access, development of more powerful mobile tablet devices with 3g and 4g features which is affordable to all children of this nation is necessary pre conditions for reaping the full potential of technology for learning. Added to this making free 3g/4g access to their mobile devices will extend learning beyond the physical confines of classroom and rigidly structured school time.
- **Questions:** The discussion could focus on the policy directives in relation to what pedagogical approaches will facilitate this mobile learning? Could teacher use flipped classroom approaches to harness the potential of this ubiquitous computing? Can we develop android mobile educational applications in Indian languages which could be

downloaded from Google play store? Should we provide unmonitored access to internet? How to provide free access to 3g/4g access to students? What are the security concerns and how to address these concerns?

Managing Technology Integration Initiatives

- There are many agencies involved in technology integration initiatives in the country. Central Government, State Governments, Business organisation like Google, Microsoft, Oracle, Intel, Azim Premji Foundation, excel soft, etc. and many NGOs. Many of these IT companies have developed e-content of various formats, e-learning solutions, and MIS and ERP solutions in addition to training teachers. They can play a vital role in supporting schools. There is a necessity to bring together the effort all these organizations to reach out to the nook and corners of this nation and avoid wastage of time and resources to reach out to all.
- Secondly, at the school level itself there is a necessity of efficient ICT management structure to provide the necessary digital leadership to create digital culture where everyone collaborate make things happen. Participation from all stake holders for creating, maintaining, and upgrading ICT infrastructure is needed. Involvement of Panchayat, SMC, PTA, alumni and other stake holders in the implementation of ICT integration should be considered. Every school could use open source comprehensive educational management and enterprise resource planning (ERP) software/MIS for managing all their affairs effectively. Creating a digital culture through technology leadership is needed to transform the educational organisations.
- **Questions:** How to bring together the efforts of all stakeholders to have unified approach? What are the potential industry partnerships? How to develop the technology leadership practices among administrators? How to maintain the ICT infrastructure? Could the school appoint a technical person to upgrade and maintain the system? Should this be given as AMC? Could we involve the linux user groups and other experts from the community? Is there a necessity for separate ICT in education policy and curriculum for each state? If so why? Do we have a technology integration plan for each school? How to develop and implement a workable school specific technology plan for each school?

Human resource development

- There is a necessity to equip all teachers with the necessary ICT skills and knowledge on the appropriate pedagogical use of ICT in teaching and learning. To this end the national ICT curriculum has specified the syllabus and also developed the training modules.
- **Questions:** The conference need to deliberate up on the methodology to reach out to all the teachers in the country. How this can be integrated with the existing training programmes and activities organised by various entities? Could there be MOOCs on professional development in the area of technology integration in school and adult education? How to give more need based and school based training rather than one size fit all approach? Is training by a trainer/master trainers is always effective? Are there possibilities of developing communities of practices among teachers to share and learn together? How to encourage the teachers to get involved in self directed professional development in ICT integration? Is social networking an educational tool? How can we leverage social media for professional development?

ICT and Disabled Learners

- Under the Digital India programme, the government is also committed to providing access to digital resources for citizens with special needs, such as those with visual or

hearing impairments (which may be partial or complete), learning or cognitive disabilities, physical disabilities which hinder operation of ubiquitous access devices such as phones, tablets and computers. The disabled friendly content and systems are being developed as per accessibility standards. We need to take special efforts to help the disabled by equipping our teachers and educational institutions to adopt innovative, cost effective assistive technologies to enable access to education for disabled children.

- **Questions:** What are the assistive technologies available for children with disabilities? How to help teachers develop awareness and the skill in using this? How to make these technologies available in every school to create an inclusive classroom? How to integrate training use of digital assistive technologies in pre-service training programmes? How to develop ICT based educational resources for learning and assessment of children with special needs? How to make the existing digital resources accessible to disabled learners? What is Universal Design for Learning? How to implement UDL in our classrooms?

Research in Technology Integration

- There is a necessity of applied and action research in the area of ICT integration that could inform pedagogical and assessment practices in schools. It is only research which will tell us whether the use technology engaged the students in learning effectively. Research is needed to implement innovative practices of using ICT and to investigate how these practices lead to change in learning and achievement. Such research will help us sustain the good practices and make it scalable.
- **Questions:** The conference could discuss on the issues raised here to reflect this in the recommendations. Are there sufficient amount of applied research to take an informed decision in our own diverse context to know what works and what doesn't? Do our teachers and teacher educators involve in innovative practices, if so do they conduct an action research on these innovations and report/disseminate it? Do we have a database of all the researches in this area? Is there a Meta analysis of these studies to find the major recommendations? Could there be a R&D unit which focus on taking up applied research in this area to inform policy makers, planners, administrators, and teachers what works? What is the role of design based research in technology integration? Could there be evaluation studies? How and who will take up programme evaluation studies? Who and how will the result of such evaluation studies be used? What is Game based learning? What are the steps in developing and popularising game based learning?

ICT and Teacher Education

- In the National Curriculum Framework for Teacher Education (NCFTE, 2009) considered among other things the Issues related to ICT in schooling as well as e-learning is in the centre-stage. The report states that ICT in spite of its potential to make learning liberating, its implementation is often not more than cosmetic. The curriculum recommends inclusion of ICT as an important curricular resource, according primacy to the role of the teacher, ensuring public ownership of digital resources, and promoting constructivist approaches that privilege anticipation and co-creation over mere access to ICTs.
- **Questions:** How to transact ICT curriculum in teacher training courses more effectively than covering it as theoretical inputs? What are the problems associated with implementing technology pedagogy integration in teacher training institutions? How to develop the competencies in e-content development and providing e-learning among teacher trainees? How to develop the competencies among teacher trainees to use ICT as

an enabler for collaborative and self directed learning?

Rewarding and recognising the performers

- National ICT award was initiated by the Government to encourage and motivate teachers in technology integration. Additionally there are also many state and private initiatives in rewarding teachers for innovations in this area.
- **Questions:** Is there a necessity to motivate the teachers in technology integration, if they themselves are convinced about the strength of it in facilitating learning? If there is a necessity then how to strengthen the existing practices? Do they need to be provided with additional incentives, if so how? Can they be funded and encouraged to attend and present their innovations in regional, national and international conferences, seminars and workshops? Could there be financial support for teachers to take up technology integration projects? Can study tours and teacher exchange help in professional development? If so, how to implement the same?

Conclusion :

We have discuss idea and concern issues for successful integration of technology in school education for teachers and students. Conference aims to grow using ICT into schools and help teachers and children make best use of the opportunities that ICTs provide. Based on National Curriculum Framework-2005, the ICT Curriculum for teachers and students intends to introduce ICT in school education. The National Repository is a collaborative platform, which proposes to bring together the best of digital resources for different subject's domains, across different stages of the school system and in different languages. Some of the issues to be taken by the Conference are ICT for school education. Exploring the potential; Implementing the national policy on ICT for school education in India, Challenges and Issues; Showcasing ICT practices, Going Beyond computer Literacy, learning from state/ BOOT partners/NGO Experience, e-Governance Mission Mode programme in school education. The ministry of education, CIET/NCERT, State education ministry/SCERT/SIET and school leaders need to work together to create a system of responsibility and accountability in implementing policy guidelines, monitoring its progress, conducting evaluation studies through programme evaluation, generating feedback and revising the guidelines in the light of these evaluation studies. ICT changes rapidly and affects both discipline knowledge and pedagogical possibilities in ways that influence teachers' perspectives for employing ICT as a constant part of the learning process. It is hoped that by ICT in school education indicators on teachers that a more comprehensive view of the role of the teacher in influencing learner outcomes, including achievement and school completion can be completed.