Theme: Challenges of Education
Sub- Themes: Operationalizing ICT by Innovative Practices

Abstract
        This paper is a an attempt to address the challenges in education in the state Arunachal Pradesh with the help of Information and Communication Technology (ICT) by operationalizing it with innovative practices. This also highlights the importance & its mandatory need for education, which is indispensable in the present day. Globalization and innovations in technology have led to an increased use of ICTs in all sectors - and education is no exception. Uses of ICTs in education are widespread and are continually growing worldwide. It is generally believed that ICTs can empower teachers and learners, making significant contributions to learning and achievement. Technology and innovation have brought tremendous change in the way the students learn. With a global network, newer avenues and resources of learning available, technology exposure and technology adoption amongst students is higher and learning is no longer confined to the classrooms. For the students to take effective advantage of technology, the teachers have to play a key role not just as imparters of knowledge but also as facilitators who will guide the students in using technology for their benefit. The teachers need comprehensive and sustained professional development opportunities that cultivate multiple skills such as knowledge managers, developers of learning strategies and facilitators of technological and innovative methods of learning.
        The paper also lists out some of the initiatives of Digital India to better the education scenario of the country and our state should take advantage of the these.

Introduction:
        To accurately understand the importance of ICT in Education there is need to actually understand the meaning of ICT. ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a —diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. The Internet is a driving force for much development and innovation in both developed and developing countries. Countries must be able to benefit from technological developments.
In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non- formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.
        In developing countries, where a large population lives at subsistence levels, primary education is a major tool for enriching human capital. At the primary level, young minds are enlightened to accept new ideas, show creativity, develop critical thinking and above all, enable themselves to absorb surrounding information for informed decision-making at any later stage in life. In this regard, computer studies or ICT becomes immensely

important. It is now a matter of choice, rather than availability to introduce ICT at primary school level — at least in the urban areas.

It is important to note that there are two very different and distinct aspects of ICT in education: 1. One teaching ICT itself and 2. The second is using ICT as an augmented tool to the existing teaching methods which is more important. This second aspect can be extended further by making computers available to children at home for work and play both.

Importance Of Ict In Education

The main purpose of the Strategy for Information and Communication Technology Implementation in Education is to provide the prospects and trends of integrating information and communication technology (ICT) into the general educational activities. There are some unavoidable facts in the modern education;

- First, the ICT has been developing very rapidly nowadays. Therefore, in order to balance it, the whole educational system should be reformed and ICT should be integrated into educational activities.

- Second, the influence of ICT, especially internet (open source tool) cannot be ignored in our student's lives. So, the learning activities should be reoriented and reformulated, from the manual source centered to the open source ones. In this case the widely use of internet access has been an unavoidable policy that should be anticipated by schools authorities.

- Third, the presence of multimedia games and online games by internet has been another serious problem that should be wisely handled by the educational institutions. The students cannot be exterminated from this case. In such situation, education institutions play an important role to eradicate these problems. One of which is by facilitating the students to do edutainment or educational games. Schools can let their students be familiar with educational games adjusted by their teachers. Besides, they can also support and facilitate their students to have their own blogs in the internet. They can also create innovation in web design that it may be out of the formal curriculum content, but it will be useful for their future.

- Fourth, the implementation of ICT in education has not been a priority trend of educational reform and the state paid little attention to it. Therefore, there should be an active participation, initiative and good will of the schools and the government institutions to enhance ICT implementation at school.

- Fifth, the teachers should be the main motivator and initiator of the ICT implementation at schools. The teachers should be aware of the social change in their teaching activities. They should be the agent of change from the classical method into the modern one. They must also be the part of the global change in learning and teaching modification.

The followings are the aim and objectives of ICT implementation in education:
- Integrate ICT into teaching, learning and evaluation
- Develop digital literacy skills
- Acquire, organize and create digital resources like eLibrary, distant learning, online books.

- Easy learning and knowledge sharing
- Use of ICT in making classrooms more effective and inclusive
- Access various tools and applications for learning
- Practise safe, legal and ethical use of ICT
- Participate in teacher's network.

ICTs can enhance the quality of education in several ways:

- by increasing learner motivation and engagement,
- by facilitating the acquisition of basic skills, and
- by enhancing teacher training.

ICTs are also transformational tools which when used appropriately, can promote the shift to a learner-centered environment. ICTs such as videos, television and multimedia computer software that combine text, sound, and colourful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Educational videos now encompass multimedia CDs, interactive games, flash and 3-D animation, slide-shows (like PowerPoint), video books, digital story-telling and many other forms that imaginatively combine visuals with text and audio that can be delivered on a range of platforms. The information not only in textual form but in audio, video or any other media is also to be transmitted to the users. It has opened new avenues like e-learning, Virtual University, e-coaching, e-education, e-journal, etc.

Third generation mobiles are also part of ICT. Mobile is being used in imparting information fast and at low cost. ICT brings richer material in the classrooms and libraries for the teachers and students. It has provided opportunity for the learner to use maximum senses to get information. It has broken the monotony and provided variety in the teaching-learning situation.

It is a well known fact that not a single teacher is capable of giving up to date and complete information in his/her own subject. The ICT can fill this gap because it can provide access to different sources of information. It will provide correct information as comprehensive as possible in different formats with different examples. ICT provides online interaction facility. Students and teachers can exchange their ideas and views and get clarification on any topic from different experts, practitioners, etc. It helps learners to broaden the information base. ICT provides variety in the presentation of content which helps learners in concentration, better understanding, and long retention of information which is not possible otherwise. The learners can get opportunity to work on any live project with learners and experts from other countries.

ICT provides flexibility to learners which are denied by the traditional process and method. Flexibility is a must for mastery learning and quality learning. On INTERNET many websites are available freely which may be utilized by teachers and students for understanding different concepts, improving vocabulary, developing Reasoning &Thinking, et

The teachers should increase the use of ICT for content transaction, preparation of the teaching-learning materials, academic planning, project work and making presentations as these are the components directly related to the teaching-learning process, rather than using it for maintaining records, examination purpose and downloading information. For the fulfillment of this objective, training programmes need to be conducted on a large scale and at regular intervals.

Smart Classrooms are technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, specialized

software, audience response technology, assistive listening devices, networking, and audio/visual capabilities. Classroom Services leads the support, design, and planning for campus learning spaces.

To address teacher absenteeism biometric attendance of teachers in the schools of capital complex has been launched by Department of IT & Communication, Govt. of Arunachal Pradesh on pilot basis, which is operational in the state. The system monitors the the daily attendance of teachers on a daily basis. Similar concept can be applied for student attendance.

Another successful ICT project in the state is the Online Entrance Management system which is an end-to- end application for management the entrance exam from registration to declaration of results.

Digital India Initiatives

- **National Scholarship Portal**: This initiative aims at making the scholarship process easy. From submitting the application, verification, sanction and disbursal to end beneficiary, everything related to government scholarships can be done on this single portal online.

- **Digilocker:** DigiLocker is a platform for issuance and verification of documents & certificates in a digital way, thus eliminating the use of physical documents. Indian citizens who sign up for a DigiLocker account get a dedicated cloud storage space that is linked to their Aadhaar (UIDAI) number. Organizations that are registered with Digital Locker can push electronic copies of documents and certificates (e.g. driving license, Voter ID, School certificates) directly into citizens lockers. Citizens can also upload scanned copies of their legacy documents in their accounts. These legacy documents can be electronically signed using the eSign facility.

- **eBasta:** In line with the government's Digital India initiative, this project 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 also been made, along with the web based applications that can be installed on tablets for navigating the framework. The framework, implemented as a portal, brings together three categories of stakeholders: the publisher, the school and the student.

- **SMS based Mid-Day Meal (MDM) monitoring system** : Mid-Day Meal mobile app is meant for effective monitoring of daily and monthly mid-day meal data to be sent by the schools. The app provides additional data communicating mechanism for the MDM in-charge/teacher who has to send the daily/monthly data using SMS. The app, once installed on android device, does not need Internet to send MDM figures as user has option to send the figure through SMS from the app. This simplifies the job of MDM in-charge, who even does not have to remember the SMS formats. The higher authorities at Block, District and State level have a very simple and effective mechanism in shape of this app on their mobile devices for effective and efficient monitoring of daily as well as monthly data transmission by all the MDM in-charge falling under their jurisdiction. The authorities can send SMS alerts to all defaulters using single button available in the app.

- **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.

- **ePathshala**: Developed by NCERT, ePathshala 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. All the concerned stakeholders such as students, teachers, educators and parents can access e-books through multiple technology platforms i.e. mobile phones (android, iOS and Windows platforms), and tablets (as e-pub) and on web through laptops and desktops (as flipbooks).

- **Sugamaya Pustakalya:** "Sugamaya Pustakalaya" is an online platform that makes accessible content available to print-disabled people. The library houses publications across diverse subjects and languages and multiple accessible formats. It has been created by Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice and Empowerment in collaboration with member organizations of Daisy Forum of India and powered by TCS Access.

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