

# THE IMPACT OF ICT IMMERSION IN EDUCATIONAL TECHNOLOGY AND PEDAGOGICAL TECHNIQUES

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## ABSTRACT

*The impact of Information and Communication Technology (ICT) on education has always been widely discussed. The importance of incorporating ICT in education has also been mentioned in the National Education Policy (NEP) of 2020. Early theorists have discussed the theoretical basis for the need of ICT and the impact it can have in the teaching learning process. COVID-19 was a reason for accelerating the process of inclusion of ICT. Our society faces innumerable challenges with respect to access to education, high dropout rates etc. The researcher tries to look at how businesses or organisations can help in ICT immersion in various domains of teaching and STEM learning. The researcher intends to use qualitative techniques to research and discuss the same.*

**Keywords:** *ICT, Educational Technology, Education*

## INTRODUCTION

Information and Communication Technology (ICT) has always been a well discussed topic in the domain of education. Information and communication technology plays a vital role in various domains of teaching profession. It is directly concerned with different perspectives of teaching and incorporated the teachers to cope with the forthcoming challenges of educational society viz a viz quality and efficiency of education, access to knowledge, flexibility, lack of qualified and skilled teachers, teaching learning activities, high dropout rates and so on.

A technology that includes various activities like gathering, processing and storing data can be one of the definitions of ICT. ICT has become an integral part of our lives and the education sector in general. According to United Nations Development Program (UNDP) "ICTs are basically information handling tools - a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information".

Technological, pedagogical and content knowledge (TPACK framework) can be very effectively imparted so that an environment of active learning can be created. Educators will find it easier to impart this education using the TPACK framework if challenging topics can be very efficiently presented thereby creating a positive impact on education. To do so, an extensive database, knowledge, content, resource sharing, learning platforms, learning management systems and apps need to be created. As already discussed in NEP 2020, the National Educational Technology Forum (NETF) will be creating a common knowledge sharing platform which will make it easier for ICT integration and immersion which will therefore promote extensive use of technology for learning, planning, administration and assessment. The aim would be to ensure effective knowledge sharing amongst institutions both at State and Central levels, thereby ensuring best practices will also be shared. Educational technology would be upgraded and then we can hope for positive outcomes in terms innovation and research. These practices in educational technology can help in regular flow of information in the ever-changing fast paced field of education. Immersive technologies can be defined as an amalgamation of virtual content along with the physical environment. It is used to create an experience which is immersive thereby making the user accept virtual elements. Various immersive technologies are as follows: Augmented reality, Virtual reality, TelePresence etc.

Immersive technology is an integration of virtual content with the physical environment in a way that allows users to engage naturally with the blended reality. In an immersive experience, the user accepts virtual elements

of their environment as part of the whole, potentially becoming less conscious that those elements are not part of physical reality. Immersive technologies includes :virtual reality (VR) – a digital environment that replaces the user’s physical surroundings. These technologies are supported by various gadgets and softwares like VR headsets, drones, cameras, robots, speech recognition software etc. The intention behind including these advanced technologies is to give a realistic experience to the user. These technologies are being used in various sectors like entertainment, hospitality industry and can also be replicated or used in education. It is already being used in health education and healthcare industry successfully making it a very effective tool to combat various illnesses and viruses.

### **Educational Technology and ICT**

According to AECT (Association of Educational Communications and Technology)- “Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources.” (AECT, 2007)

Disruptive technologies and its impact on education and its structures also need to be assessed and implementation of newer educational technology needs to be done with greater accuracy and frequency so that our education system is poised to quickly respond to the need for training students and make them well equipped and knowledgeable in various areas like healthcare, agriculture and climate change. Earlier policies which were implemented largely focused only issues with regards to equity and access to education thereby implementing Right of Children to Free and Compulsory Education Act, 2009 which took care of the legal reinforcements to Universal Elementary Education (UEE).

NEP 2020 looks further beyond all these aspects and focuses more on how the curriculum can be altered to ensure that the education being offered in our country is on par with that of the western world. With access and equity, NEP 2020 also looks at various aspects and changes that need to be brought about in education. In NEP 2020, there is special emphasis and focus on integration of ICT and inclusion of latest technologies like artificial intelligence, blockchain etc. This chapter includes aspects that deal with digital literacies and technologies which tends to provide a more comprehensive approach to education thereby ensuring that students have access to world class technologies and helping integrate them in an effective manner to derive maximum benefit from this inclusion. To enhance learning in a conducive environment, it is important to interconnect these databases and sources. If and when this is done effectively, it can help in active learning. It can also help learners understand knowledge in a different perspective especially knowledge based on constructivism theories in education.

### **Indian education System, NEP 2020 and ICT integration**

According to NEP 2020, India is considered to be a global pioneer and leader in cutting edge technologies especially in ICT. Government of India has introduced Digital India Campaign to help the nation in transforming into a well equipped and digitally transformed nation. The Digital India Campaign not only improves the processes in education but it will also strengthen the relation between technology and education. Along with robust and improved governance, NEP 2020 states that to empower the school systems it is important to have a conducive environment where information can be shared easily amongst educators to encourage collaborative learning and shared experiences using shared learning management systems and softwares. The initiatives taken by the government, local bodies with regards to ICT inclusion will empower teachers, students and parent community.

It is of utmost importance to adapt to the inclusion of ICT technologies by ensuring good quality and adequate infrastructure. Maintaining the initiative in this direction by creating common and shared spaces online or offline where such enrichment activities can be conducted. Introduction of courses which are ICT dependent and supported by ICT equipped library spaces at various levels of education like schools, HEIs (Higher Education Institution), Adult Education etc.

Newer technologies including hand held devices, various softwares, hardware and applications will help further incorporating immersive technologies using Artificial Intelligence, machine learning and blockchains etc which

will help in overall student development. This will also require upgrading the skills set of the teachers involved. By making them tech savvy and supportive devices the use of technology and its integration The Indian government will ensure this by creating a common platform for teachers which will be autonomous called the DIKSHA platform which will be promoted along with other educational initiatives and better integrated with various schools and colleges. The main obstacle that the government would face would be to keep up to date with disruptive technologies. To develop the higher order competencies of our student community, it is important to integrate ICT tools and manage user friendly application systems which can keep transforming the education system. Education can easily integrate these disruptive technologies like AI etc. National Research Foundation will initiate research to understand how these technologies can be used in education in a phased manner. This will ensure that education technology will help find answers to challenges in the area if climate change, healthcare etc.

### **Pedagogy and ICT**

The constructivism theory stated by Jean Piaget indicates that real life experiences play a very important role in their education process. We make sense of what happens in our surrounding by the knowledge we possess. In short it means that based on your own experiences you are constructing a meaning and perspective of things. The advantage of such learning is that such knowledge where the learner attempts to apply effort and ensures active participation. Application based learning or simulated learning using ICT technologies can improve the analytical and conceptual capabilities. Students would be able to critically analyse the situation and derive the answers on their own to problems. Such teaching learning practices will prove to be productive and help students be insightful, have clear logical and reasoning skills and ensure that their perceptions are so evolved so that they can be relayed in a better manner. These practical learning experiences will sure a better understanding of the subject matter by the learner.

Blended learning may be defined as a method of learning which combines both face to face teaching learning with digital learning tools . In the truest senses, in a blended learning environment both the teacher and the learner must be available in the same space. This form of learning can help in increasing the engagement of the learner where the learner is provided with opportunities for experiential learning which will help improve learning skills; one can gain greater access to information and the hands on approach. Amongst many of the blended learning models, the researcher believes that Project-Based Learning model will help in experiential learning and thereby students will be driven in their strive to gain knowledge and along with collaborative based learning model students seek answers to real world challenges or problems .The advantages can be improved learning skills and can help develop a quest for knowledge.

By integrating ICT in various domains, educators can play a transformative role in pedagogical and curriculum development. Experiential learning can be a key element which can be enhanced by integration of ICT. The problems that students learning in the Indian education faced were in terms of accessibility and that problem was defeated by Agastya Foundation.

### **Agastya Foundation and Experiential Learning through Education**

Agastya Foundation was started in Bangalore by a group of highly diverse individuals who had a wealth of experience and felt the need to include aspects of peer-to-peer learning and experiential learning. The idea was to break the conventions of traditional techniques.. The Foundation started by emphasizing on various tools used in learning for science education. A creative and innovative model was created which can provide opportunities for the rural student populace in Andhra Pradesh and Karnataka.

'Agastya's vision is an India of 'thinkers, solution-seekers and creators' who are 'humane, anchored and connected'. The Foundation has initiated many programs which are so innovative especially in the field of science education. Creativity labs, discovery center where students are taught to learn and interact with exhibits on science are also part of its program. It also has model for motivating teacher training programs, an ecology initiative and an art center. It is one of the world's largest mobile and hands-on science education programs

catering to economically disadvantaged children and public-school teachers. Two of their most prominent projects which are very good examples which have proven to be an excellent case study to understand experiential learning are Campus Creativity Labs and iMobile Lab Vans.

As per information from their official website, Campus Creativity Lab is located in a huge campus in Andhra Pradesh. The area houses art centers, science labs, astronomy centre, math park, S planetarium etc, With over 800 teachers and volunteers, the Foundation has created an environment where students can explore and learn different aspects in STEM based learning. As the global economy is changing and many of the jobs are automated. It is important to develop a desire to learn newer aspects in the field of Science, Technology, Engineering and Mathematics (STEM). This approach will help create skills like team work, independent thinking, critical analysis and problem solving. 'The school has cumulatively reached over eight million with around 1.5 million children every year apart from 2.5 million teachers. In 2016, the school had a ₹300 million (\$4.1 million) annual budget, 850 employees, 138 mobile lab-vans, 50 labs on bikes, and 60 science centers spread around the 172-acre main campus in Kuppam.'

### **iMobile Lab Vans initiative by Agastya Foundation supported by Lenovo**

The concept of having labs on wheels was introduced by the Foundation and has been proven to be game-changing in the field of education and community learning. This program began in 2007 and has reached several students who are economically disadvantaged or vulnerable. This project based learning technique where the student can perform experiments. The intention of the Foundation is ensure that students develop a sense of inquiry and discover various facets in STEM by getting hands - on experience.

in a report published by Lenovo, it is stated that, 'Lenovo supports Agastya Foundation's Science laboratory in Bangalore. The programme caters to 1500 children annually generating 15,000 student exposures and 100 teacher exposures in a year. Lenovo also support three iMobile Labs. The iMobile Labs are small vehicles that are set up to carry laptops and have Lab on Tab a unique multi-sensory learning method containing digitised content for Grades VI – IX. In this programme, local community youth are trained to be teachers on the iMobile Vans, thus creating an economic opportunity within the community. These iMobile vans are functional in Bangalore, Mumbai and Gurgaon. The multisensory learning methods used in Lab on Tab (LoT) ensure that all types of learners benefit from the tool. Lenovo supports three units of the LoT programme in Bengaluru, Mumbai, and Gurugram reaching out to a total of 3000 children annually generating 24,000 student exposures annually. The overall impact of these programmes is 15 million students and 250,000 teachers in India.'

This program advocates the use of new learning pedagogies of Explore, Play and Learn. These pedagogies further help a sense of inquiry, self exploration of concepts and self learning using digital devices and digital content. As a part of the Corporate Social Responsibility of Lenovo, they are committed to providing best in class technologies and devices for delivering innovation oin education. Through this campaign Lenovo has touched upon the social outlook of integrating technology for the benefit of the society. Their partnership with Agastya Foundation empowers the underprivileged classes which do not have access to Education. The Foundation understand the importance of Blended Learning and has created a far reaching, innovative, flexible digital connect between teachers and students, Keeping in mind, the focus on critical learning and experiential learning, Mobile i Vans and Lab on Tab intends to create outreach programmes which also falls under the Samagrah Shiksha Initiative of Government of India. Such initiatives can help provide access to quality education and technology can act as a leveraging factor to create opportunities in blended and experiential learning.

### **CONCLUSION**

Agastya Foundation also partners with other institutions and organisations for support thereby fostering their central aim which is to develop student curiosity in the world around them and to launch them on a path of lifetime discovery and understanding, irrespective of their economic or social background. "The lesson we

derive out of [the Agastya] experience is that innovative and student friendly solutions are needed to enable scientific learning in the youth, especially those in rural and remote regions of the nations of the world.” - Former President of India, Dr. A.P.J. Abdul Kalam

When challenges with regards to inequity and inaccessibility to education are being addressed by such organisations. The next step is to ensure equitable access to technology and innovation in educational technology. This will further strengthen the aims of education and digital inclusion which will further better the learning and teaching process. This will further help develop the higher order competencies of the future generations.

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