ICT In Education: Opportunities and Challenges

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Abstract:

ICT (Information and Communications Technology) in Education plays a pivotal role in today's world. We have been witnessing a revolutionary change in the entire education domain with the implementation of ICT in various forms and methods. ICT majorly focusses to be a support system to the more conventional teaching methods and helps in better cognitive development. This paper will majorly focus on the various Government run ICT schemes such as Massive Open Online Course (Mooc), Study Webs of Active-Learning for Young Aspiring Minds (Swayam), Swayam Prabha, National Digital Library, E-Pathshala and E-PG PATHSHALA. The focus would also be on a recent development by the Government of India which introduced "Operation Digital Board" in the 65th meeting of The Central Advisory Board of Education (CABE) which is a step ahead to its earlier "Operation Black Board" which was introduced in The National Policy on Education (NPE), 1986. This study will further delve into the nitty-gritty of all the above-mentioned schemes and the various opportunities and challenges encountered in implementing and executing ICT seamlessly.

***Keywords** : ICT, Education*

1. Introduction:

The Importance of Information and Communications Technology (ICT) in Education has increased gradually with the constant evolution in Technology aided learning processes. The role of ICT in Education is to support, enhance and optimize the delivery of information. ICT in Education is the use of Audio Visuals, Presentations, Animations, Digital Libraries, Online Classes, Artificial Intelligence, to name a few. Conventional teaching methods can be enhanced with the support of ICT. One single teacher in a monologue of 45 minutes faces great difficulty in catering to all the students in such short span of time. If ICT is coupled with conventional teaching methods, then many areas of concerns can be addressed with students getting audio-visual materials and repeated learning sessions. Being a Developing Country, we face many challenges in implementing technology. But to make our presence felt in the global map, we have to overcome the hindrances and move forward towards making major breakthroughs.

2. Literature Review:

Dr. C.V. Satyaprakasha and Yaspal Sudhanshu. (2014)[1] investigated the effect of Multi Media Teaching on Achievements in Biology. They found that Multi Media Teaching was more effective in the knowledge transferring process and better understanding of the students compared to the conventional method. It catered different objectives and the total achievement in biology were significantly attained by both boys and girls in the experimental group.

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[1] Satyaprakasha , C.V. & Sudhanshu, Y. (2014). Retrieved 26 January 2021, from http://ijepr.org/doc/V3_Is1_March14/ij9.pdf

Dr. Minoy Bozie. (2014)[2] presented a study on the effect of Biological Science Enquiry Model on the Achievement in Biology among Class – VIII Students. It was found that the application of this model has attained better achievements in both boys and girls than the conventional method. It was also found that the principles of the Biological Science Enquiry Model could be of help while writing the textbooks of science.

Dr. K.V. Sridevi. (2010)[3] conducted a study to examine the Attitude of Secondary School Teachers towards e-Learning. It was found that 34% of teachers were having positive attitude towards e-Learning while 40% of the teachers had negative attitude and 25.8% were uncertain. It revealed that the attitude was different depending on the Locale of the School, Type of the School, Teaching Experience, Subject of Teaching, Qualification and Training in Computers. It was found that Urban Teachers have better attitude compared to Rural Teachers. It was also found that Male Teachers have better attitude compared to female teachers. It was revealed that the trainings imparted to the teachers were not adequate and there is a need for repeated training sessions to make them more capable to use the facilities of e-Learning. Lack of proper facilities of e-Learning and lack of time were the main reasons why the teachers knowingly or unknowingly ignore the e-Learning system.

3. Objectives of the Study:

i) To find out the initiatives taken by the Government of India in implementing ICT in Education.
ii) To find out the challenges encountered while implementing ICT In Education.
iii) To find out the solutions to the challenges encountered while implementing ICT In Education.

3. Opportunities:

3.1 Digital India :

The Government of India within the spectrum of its "**Digital India[4]**" campaign has introduced many schemes to facilitate the use of ICT in Education which are as follows-

(i) Massive Open Online Course (MOOC)[5]

MOOC is a Digital Platform majorly used for Distance Learning. Thousands of students can take the same course at the same time. It is an online course where students can avail Recorded Lectures, Online Exams and Evaluations, Q and A Sessions and many more anytime, anywhere at zero cost. It's an Interactive Community of Students, Professors and Teaching Assistants. Students can also obtain a Certificate by paying a nominal fee.

(ii) Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM)[6]

[2] Bozie, M. (2014). Retrieved 26 January 2014, from http://www.thescholedge.org/index.php/sijmd/oai?verb=ListRecords&metadataPrefix=nlm
[3] Sridevi, K. (2010). Retrieved 25 January 2021, from http://14.139.186.108/jspui/bitstream/123456789/1458/1/26.pdf
[4] https://www.mygov.in/group/digital-india
[5] Chauhan, J. (2017). *An Overview of MOOC in India*. International Journal of Computer Trends And Technology, *49*(2), 111-120
[6] Online education Programme | SWAYAM | Ministry of India | IIMBx. (2021). Retrieved 9 April 2020, from https://iimbx.iimb.ac.in/swayam

SWAYAM is an integrated platform for online courses, using Information and Communications Technology which covers School to Post Graduate Level. It was launched by Shri Pranab Mukherjee. SWAYAM has been indigenously developed by The Ministry of Human Resource Development (MHRD) and All India Council of Technical Education (AICTE) with the help of Microsoft. At present, about 2000 Courses and 8000 Hours of Learning are listed on SWAYAM, wherein about 30 Lacs Students have already enrolled to these courses. It offers online courses for Students, Teachers and Educators. It is designed to achieve the Three Cardinal Principles of Education Policy, viz., Access, Equity and Quality and also bridges the gap for students who have not experienced Digital Revolution in the Knowledge Economy. Certificates after successful completion of the course can be obtained by paying a nominal fee.

(iii) Swayam Prabha[7]

Swayam Prabha is a Group of 32 DTH Channels devoted towards telecasting High Quality Educational Programmes, aired 24 x 7 using GSAT-15 Satellite. It provides new content for at least 4 hours which is repeated 5 times a day allowing convenience to students. The channels are up linked by NPTEL, IITs, UGC, CEC, IGNOU, NCERT & NIOS. The INFLIBNET Centre maintains its Web Portal. It offers diverse subjects across Under-Graduate and Post-Graduate Levels. In Higher Education, it provides curriculum-based course contents at post graduate and under graduate levels covering diverse disciplines such as Arts, Sciences, Humanities, Engineering, Technology, Law, Medicine, Agriculture to name a few. All courses would be certification ready in their detailed offering through SWAYAM, the platform being developed for offering MOOC courses.

(iv) E-Pathshala[8] and E-PG Pathshala[9]

E-Pathshala is a Portal jointly initiated by The Ministry of Human Resource Development (MHRD), Government of India and National Council of Educational Research and Training (NCERT) launched in November, 2015. E-PG Pathshala is an initiative by The Ministry of Human Resource Development (MHRD) under its National Mission on Education through ICT (NME-ICT) being executed by the UGC. It caters to variety of subjects like Arts, Architecture, Buddhist Studies, Comparative Literature, Comparative Study of Religions, Home Science, Performing Arts, Philosophy, Visual Arts and many more.

It's a multilingual platform which provides courses in Chinese, English, Hindi, Japanese, Russian, Sanskrit, Spanish, etc.

3.2 Wide Range of Subjects:

(i) Engineering and Technology:

Analytical Chemistry, Computer Science, Electronic Science, Human Resource Development, Information Technology, Management, Material Science, etc.

(ii) Life Sciences:

[7] Amanta,A.(2018). *Analytical Study of SWAYAM.* International Journal of Research and Analytical Reviews.5(3)1374-1379.
[8] Shaheen Altaf Shaikh, S. (2017). *Student Teacher Awareness of MOOCS - Massive Online Open Courses*. International Journal of Educational Science and Research, 7(6), 105-110.
[9] Sharma, R. (2018). *Combining MOOCs with Social Media: An effective way of imparting LIS education in India.* IFLA WLIC, 1-14.

Bio-Technology, Botany, Bio-Chemistry, Nutrition, etc.

(iii) Medical and Health Sciences:
Bio-Informatics, Bio-Physics, Museology and Conservation, Physical Education, Sports and Health Education, Social Medicine and Community Health, Zoology, etc.

(iv) Physical and Basic Sciences:
Chemistry, Earth Science, Environmental Science, Geology, Jyotish-Ganit, Mathematics, Physics, Statistics, etc.

(v) Social Sciences:
Sociology, Political Science, Adult Education, Anthropology, Business Economics, Education, Forensic Science, Geography, Human Rights and Duties, Law, Psychology, Women Studies/Gender Studies, etc.

(vi) It hosts educational resources like-
Textbooks, Audio-Visuals, Periodicals and more for Students, Teachers, Parents, Researchers and Educators and is available on the Web and through Android / IOS / Windows Mobile Apps in English, Hindi and Urdu Language. There is no threshold to downloading.

(v) National Digital Library[10]

The National Digital Library of India (NDL) is a project to develop a framework of virtual repository of learning resources with a single window search facility. Shri Prakash Javadekar launched the New Digital Initiative by The Ministry of Human Resource Development (MHRD) on 19th June, 2018 on the occasion of National Reading Day.[11] It's an initiative of National Mission on Education through ICT (NME-ICT) and "Padhe Bharat Badhe Bharat".

(vi) Operation Digital Board

Operation Digital Board was launched by The Ministry of Human Resource Development (MHRD) in the 65th Meeting of The Central Advisory Board of Education (CABE)[12] on 16th January, 2018. This is step ahead to its earlier "Operation Black Board"[13] which was introduced in The National Policy on Education (NPE), 1986.

The goal is to equip 7 Lakhs Classrooms of 9th, 10th, and 11th Standard and 2 Lakhs Classrooms of Colleges and Universities with Digital Facilities for Teaching by 2022. Human Resource Development Minister, Shri Prakash Javadekar[14] said "Around 60-70 years back, Operation Black Board was launched, and now as the Country is progressing, we have come up with Operation Digital Board, the aim of which is to have digital and interactive board in every classroom." This is a Pedagogical Intervention to enable Technology aided Learning and to raise the Teaching Standards.

[10] (2020). Retrieved 18 February 2020, from https://www.ugc.ac.in/pdfnews/9173825_NME-ICT-MHRD.pdf

[11] Bhartiya, T. (2020). Retrieved 25 January 2021, from https://tribhuwankumarbhartiya.com/current-affairs/

[12] MHRD (2021). Retrieved 24 January 2021, from https://www.education.gov.in/sites/upload_files/mhrd/files/65th_CABE.pdf

[13] Dyer, C. (2000). *Operation Blackboard: Policy Implementation in Indian Elementary Education. Monographs in International Education*. Symposium Books.

[14] Prakash Javadekar Union Minister of Human Resource Development - 5th July 2016 to 30th May 2019 · https://tribhuwankumarbhartiya.com/current-affairs/

4. Challenges for ICT in Education:

ICT in Education has gained the attention all over the world. India has also taken huge initiatives to implement ICT at a large scale, but still there are many challenges in the implementation of ICT in India. On the basis of studies conducted by Prof. Rita Devi [15](Malwa Central College of Education for Women), Prof. Rajwindar Kaur [16](Khalsa College of Education) and Chiranjit Majumder [17](Research Scholar, Department of Nutrition, Seacom Skills University, Birbhum, West Bengal, India), the following challenges have been found:

i) Low Awareness among Students:

According to Rita Devi The MOOC is not new in India, we can trace the journey of MOOCs since 2003, but still the awareness among learners is very low regarding the MOOCs and its benefits. Shaikh[18] (2017) conducted a study on student teacher of teacher training and found that the awareness about MOOCs among the learners is very low and even perceptions to MOOCs were quite negative.

ii) Diversified Needs of Learners

As India has a lot of diversity, there are people who belong from various cultures and they speak different languages. India has 22 major regional languages. It is very difficult to offer the facilities in various languages.

iii) Less Enrolment in Courses

In India, enrolment of learners is very less in ICT enabled courses because they are not fully aware about the same. So, there is a big need for Digital Marketing and Advertisements to make the learners aware about the benefits of ICT in Education.

iv) Less Retention Rate

There is a very high rate of dropouts in courses which are completely driven by ICT. It is very difficult to maintain the interest of students in long term courses without face-to-face interaction.

v) Low Awareness among Teachers

After completing more than three years, since the official launch of SWAYAM Portal in India, the awareness among teachers is still low. Singh and Chauhan (2017)[19] conducted an online survey on awareness about MOOCs on teacher educators. Data was collected from all over India and they found that teacher educators are having basic idea about MOOCs but they are not aware about the process, procedures and assessment strategies of MOOCs.

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[15] Devi, R.(2019). Massive Open Online Courses and Challenges in India. International journal of Applied Research. 5(8): 453-456

[16] Kaur,R.(2019).MOOCs in Higher Education: Challenges and Opportunities. International Journal of 360° Management Review, 7(SPL)

[17] Majumder, C .(2019). SWAYAM: The Dream Initiative of India and its uses in Education. International Journal of Trend in Scientific Research and Development ,3(3)

[18] Shaheen Altaf Shaikh, S. (2017). *Student Teacher Awareness of MOOCS - Massive Online Open Courses*. International Journal of Educational Science and Research, 7(6), 105-110

[19] Singh., & Chauhan. (2017). *Awareness towards Massive Open Online Course (MOOCs) and their usage for Teacher Education in India*. Asian Journal of Distance Education. 2017; 12(2):81-88. http://www.AsianJDE.org

vi) Lack of Resources in Institutions

To implement and offer ICT enabled learning, resources like Computers, Internet Connectivity, etc. are required and most of the institutions [20]do not have proper infrastructure in place.

vii) Ensuring the Quality of Digital Study Materials

Another concern is the quality of Digital Study Materials. While developing Digital Study Materials, utmost care needs to be taken towards the quality.

viii) Limitations of ICT

Providing timely support and assessment of students has become a challenging task as far as ICT is concerned. Professors or academicians might be able to design and deliver online lectures but at the same time they may not be able to connect and evaluate all the students who are the participants of their course.

5. Some More Challenges of Implementing and Executing ICT Seamlessly:

i) Relying on user-generated content can create a chaotic learning environment.
ii) Digital literacy is necessary to make use of the online materials.
iii) The time and effort required from participants may exceed what students are willing to commit to a free online course.
iv) Once the course is released, content will be reshaped and reinterpreted by the massive student body, making the course trajectory difficult for instructors to control.
v) Participants must self-regulate and set their own goals.
vi) Language and translation barriers.
vii) Requirement of Electricity / Network / Internet / DTH. Resistance towards technology.
viii) Inclination towards conventional teaching methods.
ix) Not utilizing resources optimally.
x) Not providing proper maintenance to resources.
xi) Socio-Economic conditions can also introduce hindrances.

6. Some Solutions for Successfully Implementing ICT in Education:

On the basis of studies conducted by Prof. Rita Devi (Malwa Central College of Education for Women), Prof. Rajwindar Kaur (Khalsa College of Education) and Prof. Chiranjit Majumder (Research Scholar, Department of Nutrition, Seacom Skills University, Birbhum, West Bengal, India), the following solutions have been found:

i) Manufacturing Computers and Peripherals in India to reduce the cost and make it affordable.
ii) Ensuring Electricity and Mobile / Internet Connectivity to each and every corner of India.
iii) Internet Connectivity should be provided at a low cost to ensure affordability. Frequent Workshops should be conducted for Educators and Students to make them friendly with Technology.
iv) Proper Utilization and Maintenance of Resources required for ICT enabled Teaching / Learning Processes.

7. Conclusion:

On the basis of studies conducted by Prof. Rita Devi (Malwa Central College of Education for Women), Prof. Rajwindar Kaur (Khalsa College of Education) and Prof. Chiranjit Majumder (Research Scholar, Department of Nutrition, Seacom Skills University, Birbhum, West Bengal, India), the following conclusion has been made.

ICT is the future of education. It has made education easily accessible to anyone, anywhere, anytime around the globe and made people's life more improved by providing flexible and quality learning like never before. It has made a difference by providing free courses and enabled people and students world around to participate, interact, discuss and learn together. Moreover, there should be a cost effective and strategic management for implementing ICT. With some effort by the Government of India, online education can be extended to every individual. Schools, Colleges and Universities across India should be asked to organize workshops for developing MOOCs. ICT can help to impart knowledge across masses but it requires technical skills among students too. The Indian Education System would definitely take the next leap towards addressing the concerns and get the best results by implementing ICT strategically.

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