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Impediments to Adopt Nep 2020 & Integrate Ict in Indian Educational Ecosystem

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Abstract

21st Century is a revolutionary era of digitization. Information & Communication Technology (ICT) has opened the doors to creative and innovative learning amongst educators and students. As proposed in National Education Policy(NEP) 2020, implementation of ICT in educational institutions shall instill creativity, generate new learning avenues, student-centric self-paced learning. It shall lead to enhanced classroom teaching thereby, making students industry ready and techno savvy. But there's a flip side of the coin creating barriers based on factors like organizations' readiness, teacher's preparedness & perception and student's learning orientation. Very few studies have been carried out from the perspective of Indian Education System, creating a void between what is expected from educational institutions and teachers and the ground reality. This paper shall focus on varied parameters of educational and educators' inclination towards adopting the ICT as per NEP 2020. Some suggestions have been proposed in the paper to mitigate the barriers.

Index Terms— ICT, NEP, education, learner, student-centric, barriers

I. INTRODUCTION

Information and Communication Technology (ICT) is an amalgamating service based on seamless integration of software and hardware. It is the prime instrument of institutionalizing the nation with skill and creativity, at the same time pacing towards globalization. ICT has influenced all the sectors-from farming to industries, trade, finance, defense, scientific investigation as well as education. It has sunken to the grass root level of all fields. Information Technology (IT) and Information Technology enabled Services (ITeS) are a subset of ICT, opening billions of job avenues for people in India. IT sector has become one of the major catalysts for significant upsurge in GDP with a contribution of 7.4% in support with BPM industry in India's economy [20]. In a survey conducted by Amazon Web Services in 2021, it is projected that India will have nine times more digitally skilled workers by 2025. To avail the opportunities generated by IT industry, it is crucial to make the current generation students digitally skilled and align them with the needs of industry by exposing them to the wide arena of ICT tools and approaches. According to World Bank, ICT holds out the opportunity to revolutionary pedagogical methods, expand access to quality education and improve the management of education [1]. Indian educational ecosystem has still to explore and exploit the optimized use of ICT in educational institutions and schools. Effective use of ICT in education is considered to be one of the important tools to mitigate the digital divide in the country [19]. Department of School Education & Literacy, Ministry of Human Resource Development introduced ICT to have been subsumed in Rashtriya Madhyamik Shiksha Abhiyan (RMSA) [2]. The agency undertook the responsibility of announcing the implementation of ICT in schools in 2004, later with amendments in 2010. Schools and educational institutions were not completely inclined towards implementing ICT rigorously even after government directions. The reasons varied from lack of infrastructure, non-preparedness of educational institutions, aversion of teachers towards changes, ignorance at levels of students, teachers and management etc. With National Educational Policy released in 2020 [3], the Ministry of Education, Government of India, directed all the institutions instilling education to comply with the policy and include ICT as a mandatory part of the curriculum. The ground reality seems to contradict the guiding principle. Impediments for indulging into technological advancements are multi-faceted.

India is a nation rich in diversity. Whereas the cultural diversity promotes richness in ideology, value system, beliefs and ethics, the socio-economic diversity creates mental and infrastructural blockades. Rigorous implementation of ICT in

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educational ecosystem will not only enhance the delivery quality of a teacher but will also support the changing needs of learner. Accessibility of information, self-paced learning, increased creative abilities, upskilling etc. are some of the major reasons based on which the government laid procedures and protocols for implementing ICT in education. The reality seems to be far from expectation. Some of the major barriers hindering the acceptance and application of ICT are

infrastructure, socio- economic, linguistic and physical in India for avid learners [6]. These invisible barriers which may not be acknowledged at the macro level, but its impact may be realized exponentially higher to visible barriers. These include aversion to break monotony from conventional methods of teaching, lack of adequate resources, ignorance towards ne learning approaches, high dropout rates, remotely located learners [7-8]. Some authors gave explicit justification for dividing the barriers into intrinsic and extrinsic but the perspective of categorization varied. Access, time, resources, and training were cited as first-order extrinsic barriers while beliefs, attitude, practices were cited at second-order intrinsic barriers [15]. In another perspective factors pertaining to educational organizations were considered as extrinsic while individual factors pertaining to educators and administrators were considered as intrinsic factors. [16-17]

With billion-plus population in India, demand of quality education has risen multifold. Especially abled groups are benefitted from supportive advanced technology [9]. Effective use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities [10-12]. Where there exists a constant pressure on teachers to seamlessly include ICT, the successful integration of technology depends upon factors like curriculum, student level, method of application and location(urban/remote)[13]

This paper aims at providing a contrast between the expectations of ICT implementation as cited in NEP 2020 policy with actual barriers to its successful adoption

II. ICT IN EDUCATION: POST-COVID SCENARIO

Integration of ICT in educational institutions paced exponentially during the spread of Covid-19. Some institutions incorporated ICT with a vision to enrich themselves with latest teaching-learning advancement tools and technology while others inadvertently resented to ICT integration. While the self-learning was more supported in developed countries due to availability and accessibility of resources, India took a leap towards self-growth. In post-covid era, there has been paradigm shift in conventional teaching. The teaching-learning model has shifted to learner-centric approach focusing on more on practical orientation rather than wrote& theorical learning. A hybrid model of education has become more apt and acceptable providing the learner with easy access to information, online certifications, curated material, innovative and self-paced learning, online assessment tools, cloud based online practical labs, enriched digital repositories and databases, at the same time offline classrooms for one-to-one learning and collaborative working. It becomes obligatory for the educators and educational institutions to fully integrate ICT productively in teaching, be it online or offline classrooms to ensure that education reaches to both urban and rural segments..

III. IMPEDIMENTS TO IMPLEMENT ICT

Many studies were conducted in a number of schools of varied states of India to understand the barriers in adopting ICT in classroom teaching as well as curating the content digitally. In a research conducted in schools of Kerala, though the teachers showcased their willingness in adopting the advanced tools and methodology to enhance the teaching-learning process, the major constraint came out to be lack of ICT equipment in the classroom, dearth of time, improper/no training and above all influence of conventional approach in teaching[18]. Likewise studies conducted in Karnataka & Maharashtra by NCERT in 2015 critically analysed the intervention of ICT in schools and contributed to factors like lack of differentiated programmes for subject teachers, ICT teachers and heads was a major hindrance , apart of the above cited. But there's a flipped side of the coin. Negative attitude of teachers towards new teaching methodology, ignorance towards IT sector job needs, incompetence and insufficient commitment towards profession dilutes the effort. It becomes obligatory to identify barriers, only then corrective measures can be taken[21].The subsections below cites some of the major barriers affecting the seamless integration of ICT in classroom.

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A. Barriers for educators: Infrastructural Perspective

i. Lack of modern hardware: Hardware facilities like computer, printer, graphic card is an obligatory requirement for digital curation of content. For interactive teaching-learning process, flipped classroom model must be implemented. Classroom must be converted to smart classrooms fully equipped with Projector, audio-video systems, smart/white boards for efficient teaching. Easy implementation of existing government policies as per NEP 2020 for setting up infrastructure and timely maintenance will ensure the private and government aided schools and colleges with dearth of resources.

ii. Lack of software: WYSIWYG editing software for creating of graphic based digital content, suitable application software for creating creative presentations, audio-video editing & converter software, language translators etc. enables an educator to develop updated and relevant digital content. Software for checking plagiarized content to ensure the protection of intellectual content, forcing the curator to give due credit to authors is a pre-requisite for effective curation of digital repositories. Special application software for supporting specially- abled people must be procured depending upon disability type. For instance, text-to-speech converters for blind, software to support non-speaking or verbally impaired students, use of smart assistive pens with audio and writing recording to check the progress etc. Suitable ERP software are available for tracking students' progression by self, teachers as well as parents to assist and gauge learning. It is expected from management to ensure higher standards of resource availability to support enhanced learning in nation.

iii. Library & ICT Labs: Availability of latest articles, journals, books, magazines, research papers in online and offline mode in library can only lead to development of a competent and non-repetitive digital content. Computer cum ICT labs with research-oriented software shall facilitate the educators to curate the digital content effectively and timely.

iv. Services to Specially-abled: Special application software for supporting specially- abled students and teachers must be procured depending upon disability type. For instance, text-to-speech converters for blind, software to support non-speaking or verbally impaired students, use of smart assistive pens with audio and writing recording to check students' progress. Supportive infrastructure like wheel chair availability, ramp for commutation and lifts for multi-story classrooms must be in place for students and teachers.

v. Incompetent Emoluments: It is a saddened state in India that those responsible for shaping the careers of the students are lowly paid. All students placed in highly paid jobs always give due credit to the teachers who are always inadequately paid. Management must ensure better salary emoluments for highly motivated teaching fraternity.

vi. Rural versus Urban: Teachers in rural areas face a bigger challenge as compared to teachers in urban areas. With meagre infrastructure, improper classrooms in remote & far-flung areas, it is dreadful for teachers to adopt ICT[22]. The government policies in rural and urban areas are inadequate and biased.

B. Barriers for educators: Individual Growth Perspective

i. Friction to Change: Perception of teachers and their attitude towards integrating ICT in classroom are important factors towards adoption of NEP 2020. Reluctance to change and casual attitude have been asserted as major barriers towards adopting ICT in activities pertaining to teaching [13][17]. Effective utilization of ICT in curriculum will not only ensure teachers to be in line with the latest technological trends but also enrich their knowledge, build confidence, become competent and increase their employability across different nations. The quality of teaching-learning process will undoubtedly enhance with better interaction with students.

ii. Lack of Motivation & commitment: With ICT tools teachers can take leading positions as digital curators, inter-college/inter-school trainers, eligible to teach in varied institutions of repute, content/blog writers. The prime responsibility of every teacher is to be well committed to their profession, students and nation at large. They are the role models and mentors of students, guiding and grooming them, instilling them with knowledge and making them stand at par with outer world. Their role in shaping the future of students cannot be neglected, which mandates every teacher to be totally committed in making the students digitally skilled, by first upskilling themselves. While it is expected from teachers to walk an extra mile towards innovating their teaching practices, sufficient motivation from higher management is lacking. Incentivizing faculty, giving awards to best performer based on varied parameters, supporting faculty for exchange programmes are some of the initiatives expected from management to motivate the teachers for upskilling themselves.

iii. Timely Training: Effective ICT trainers for providing extensive support to different age group of teachers, different positions of teachers with various subject curriculums must be provisioned by institution as well as government

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agencies like Ministry of Electronics & Information Technology (MeitY), National Mission on Education through Information and Communication Technology (NMEICT) under Ministry of Human Resource Development(MHRD). A sustainable model can be promoted by government based on "Train the Teachers, Become Trainers".

iv. Ignorance to Career Advancement: ICT tools not only aid in improving the teaching-learning process but also provide ample opportunities for self-growth. Smart editors, convertors, summary writers, data gathering tools like google form, monkey surveys etc, enable the educators to write quality research papers, books, articles etc. supplemented with automated analytical tools like R, spreadsheet, SPSS etc. They save a lot of time and effort.

v. Peer Pressure: Lethargic and ignorant people induce the same amongst peers. Colleagues with the fear of others learning and mastering the advanced methods tend to demotivate others based on self-created scenarios. It is the responsibility of each individual to look from the higher perspective of self-growth.

vi. Support to Specially-abled: Teachers/ students with special needs require support in terms of hardware, application software and at times physical resources depending upon the disability.

vii. Curriculum: Completion of curriculum prescribed by university/ board is a time bound activity, resulting in less flexibility with teacher to learn, master and implement the ICT in classroom teaching. Apparently, the type of subject undertaken by the teacher and the syllabus content becomes a limiting factor. Certain subjects have a very insignificant scope of technology inception or as may be perceived by the teacher.

viii. Fear of Rejection & incompetence: Present generation students are seemingly more keen learners of technology. The outsmart the teachers in terms of adoption of smart technology. Due to the above-mentioned factors as well as insufficient hands-on on the technology driven tools, teachers have the fear of low performance and rejection from students. They may be perceived incompetent or mocked by students incase they are not able to do justice with the tools/technology used in the classroom, thereby, averting the teachers from adopting ICT in their respective subjects.

C. Barriers for Institutions (Schools/Colleges)

i. Lack of awareness (govt schemes, policies, impact of technology): Lack of awareness, non-participative management and ignorance of the contemporary educational practices create undue pressure on teachers. Even if the teachers are willing to adopt the new technology in classroom, resistance from management in terms of procuring new and/or updating existing infrastructural facilities becomes a hindrance.

As per NEP 2020, in order to seamlessly integrate ICT in schools and governments, especially which are unaided and lack even the basic infrastructure to implement technologically advanced tools, certain models have been proposed. Build-Own-Operate-Transfer (BOOT), Outright Purchase Model etc. are some of the models through which State with capabilities / mechanisms exist to manage all the components of the

ICT programme including the maintenance and upkeep of the IT infrastructure can provide the facilities like infrastructure, training, setting up of lab etc. to schools and colleges. Still the educational institutions not pay heed to the programmes in support by the government.

ii. High dropout ratio: Institutions face a never-ending challenge of high dropout rates of students especially at school level. Lack of resources, economic instability, a greater number of children per family are some of cause leading to insufficiency amongst people. As the number of Higher Education Institutions are increasing, there's an equal increase in students migrating to different countries for better education and facilities. Under the above circumstances, the educational institutions lack sufficient funds and motivation for investing in state-of the-art infrastructural facilities.

IV. MITIGATION OF BARRIERS

1. ICT to be part of curriculum: Organizations governing the syllabus of schools and higher educations are to ensure that ICT enabled teaching to be made integrated part of syllabus. Detailed lesson plan with suitable integration of tools mapped with topic/lesson must be provided to teachers as a guide for adoption of ICT in classroom
2. Training by professionals: Industry experts, technology experts from private and public sector are to be entrusted with training of teachers in educational institutions. Trainings must be segregated on the basis of knowledge level of

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teachers (basic/ intermediate. /advanced), positional level of teachers(junior/mid-level/senior/head), subject undertaken and age groups so as to provide suitable level of training to every group.

3. Assessment, Certification & Feedback: An assessment test should be followed by training to ensure effectiveness of trainers as well as the learning outcome of teachers. Feedback during and after the training to be conducted to ensure better performance. Once the training is completed successfully, certification and recognition of trainers and teachers must be done so it can aid in better growth perspective and provide career opportunities to teachers in industry as an initiative of industry-academia alliance.

4. Training by Teachers: Once a stratum of teachers has been trained, assessed and certified, opportunity to teachers for becoming the trainer will not only create a ripple effect of effective learning but also motivate the teaching fraternity.

5. Intervention of State/ Ministry/ Educational/Regulatory Bodies: For effective implementation o the ICT policy and to ensure the country is on its way towards digital learning, the regulatory bodies like NCERT, MeitY, State government must regularly take suitable measures. Inspection and reporting of institutions must be governed and institutions deviating from the implementation of the policy must be monitored

V. CONCLUSION

Digital learning through effective implementation of ICT is the only way towards socio-economic growth of the country. ICT is beyond the constraints of caste, community, gender and age. Though there exists a number of barriers in seamless integration of ICT in schools and colleges , especially located in remote and far-flung areas who are deprived of basic classroom facilities, government(state/central), Ministries, education bodies, affiliating bodies, educators must make a collaborative effort for the development of nation and self-growth. Educators need to be highly motivated and trained for optimizing the use of ICT in classrooms. Suitable growth and professional opportunities need to be in place to ensure that the teachers make use of ICT for formative learning assessments, individualized instruction, fostering opportunities for digital collaborative sharing amongst students [4]. Not only educators need training with respect to incorporating ICT in their respective subjects, but the management of institutions should be proficient in ICT for its efficient and productive integration [5]. In the paper, barriers from the perspective of educators and institutions have been discussed and some suggestive methods to mitigate the barriers have been proposed.

There's a need to unlearn and relearn to pace with the demands of 21st century generation and industry necessities in order to make the country digitally educated and make the people employable.

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