

The United Nations Education, Social and Cultural Organisation (UNESCO) broadly regards technology as the knowledge, skills and creative processes that may assist people to utilise tools, resources and systems to solve problems and to enhance control over the natural and made environment in an endeavour to improve the human condition (UNESCO, 1985). Under this broad sense of technology, educational technology would imply not only artefacts and devices but also methods of organisation and systems of teaching, which are employed in education to improve the learning environment (Anthony, 2012). From the use of blackboards and slates to the use of smart boards and tabs in the modern classrooms or use of a range of pedagogies from behaviourist to constructivist, technology has had a seminal influence on the teaching and learning processes in our country. With the advent of digital technology, the pace and sweep of technological influences have impacted the learning of students fundamentally. So, it is important to understand the linkages that technology has with modern education. Students are no longer solely dependent upon schools and universities for learning. Technology has provided them opportunities to learn as per their own styles and pace. Has the relationship between the learners and teachers changed? If yes, in what ways? Will the new technology also bring in a new pedagogy? Does it ask for a new learning theory replacing all the earlier ones? Are technology, learning and cognition intertwined? If yes, in what ways? In what way technology is improving the quality of education? Does technology necessarily bring equity in education? Has the emerging technology been helpful for the purposes of inclusive education? The context of libraries in schools and universities has also changed. Students and teachers/faculty members no longer visit libraries for physically accessing books and journals. Locations of schools, colleges and universities are becoming irrelevant. Is it so? What will be its impacts? In a country like us while digital divide exists, the access of digital technology to a few in the society further accentuates the class-divide within the education system. How far are such changes desirable? Does technology liberate students and teachers or enslave them? It is important to come out with evidence-based findings on these and many more such issues and publish them in order to make a more informed debates and discussions among the peers on the matter. Indian Journal of Educational Technology (IJET) seeks to achieve this objective. We are happy to inform that IJET has been included in the UGC-CARE list of approved journals.

Given the importance of technology in education, the draft National Education Policy (NEP) 2019 (Draft NEP, 2019) too has emphasised its myriad roles in the Indian educational systems. As it is known that the Committee for Draft National Education Policy submitted its report on May, 2019. Ministry of Human Resource Development (MHRD), Government of India (GoI) had constituted this committee under the chairmanship of Dr. K. Kasturirangan in June, 2017. Prior to this, MHRD led a massive exercise in the country at every possible level of the society seeking inputs all stakeholders

on the policy. A 'Committee for Evolution of the New Education Policy' under the Chairmanship of Late TSR Subramanian, former Cabinet Secretary, collated the feedbacks and inputs from the stakeholders and submitted its report in May, 2016. The present draft National Education Policy (NEP) 2019 is a voluminous document having 23 chapters and 477 pages. It is divided into four main parts, viz., Part I-School Education, Part II-Higher Education, Part III-Additional Key Focus Areas and Part IV-Transforming Education. Along with these four parts, there are addendum and appendices. Part I- School Education has eight chapters covering topics such as, Early Childhood Care Education, Foundational Literacy and Numeracy, Reintegrating dropouts and ensuring universal access to education, Curriculum and pedagogy in schools, Teachers, Equitable and inclusive education, Efficient resourcing and effective governance through school complexes and Regulation and accreditation of school education. Part II- Higher Education has 10 chapters such as, Quality universities and colleges, Institutional restructuring and consolidation, Towards a more liberal education, Optimal learning environments and support for students, Energised, engaged and capable faculty, National Research Foundation, Teacher education, Professional education, Empowered governance and effective leadership for Higher education institutions and Transforming the regulatory system. Part III- Additional Key Focus Areas has 4 chapters on: Technology in education, Vocational education, Adult education and Promotion of Indian languages. Part IV- Transforming Education has 1 chapter, viz., Rashtriya Shiksha Aayog. Addendum-Making it happen has 2 main topics discussed and they are, Financing and Way forward.

The draft policy seeks to address the five main challenges, viz., (i) access, (ii) equity, (iii) quality, (iv) affordability, and (v) accountability, faced by the current education system. The use of technology in education has been discussed in the context of all these challenges. In the part on school education, the policy sees technology mainly as a tool to enhance access, bring equity, affordability and accountability in the different educational settings. So, in the chapter on Foundational Literacy and Numeracy, it talks of National Teacher's Portal (DIKSHA) having a special section on high quality resources on foundational literacy and numeracy. It further proposes computer-based adaptive assessment to be implemented across all secondary schools in the country initially and then to all schools once computers and tablets are made available in all schools by 2023. Technological interventions as aids will be made available to teachers especially in regional languages that "teach literacy, numeracy and other foundational and curriculum material and carry out adaptive assessments and other personalised learning". It also avers that technological interventions will never be viewed as substitutes for teachers. In the 3rd chapter on universal access to education, the policy envisages creating database of all dropouts and out of school children and putting local community in charge to help such children and ensure that they eventually return to school. For CWSN (Children with Special Needs), the policy seeks to utilise innovative educational platforms involving technology for creating and sharing e-resources, promotion of e-learning and introduction of assessment on demand. In the 4th chapter on curriculum and pedagogy in schools, the draft policy suggests incorporating "computational thinking and digital literacy" along with local and Indian traditions, ethical reasoning, scientific temper etc. in curriculum. In the same chapter, the draft NEP advocates for "learning science bilingually" from grades VIII and to talk about it to in the

“local news channels”. Albeit in a limited sense, it does seek to utilise mass media for communications in education. Further, it says that the “new curriculum will integrate digital literacy for all learners at the basic level, with hands-on assessments and worksheets keeping in mind the available digital infrastructure and at a more advanced level, curricula will be developed for computational thinking and programming and other computer-based activities” including textbooks on computer sciences. The draft NEP seeks to use digital technology for assessments with far-reaching consequences. It says, “Once internet and computers are standard in schools, assessment at all levels-especially during the Middle and Secondary stages –may also be conducted in an adaptive computer assisted manner, so that students could regularly monitor their own progress and formulate, with the help of their teachers, revised personalised learning plans and goals. Formal official assessments, such as Board and entrance examinations, could eventually be conducted in this manner also, with students thereby easily able to take such tests on more than one or two occasions to improve”. It also recommends extensive use of computer-based testing by the National Testing Agency (NTA). The policy also seeks to make internet based apps, assessments and online communities available for students. All textbooks will be made available in digital formats including for CWSN as well.

In the chapter on teachers, the draft NEP suggests creating a conducive environment and culture for teachers at school and along with the facilities of clean drinking water, toilets, electricity, computing devices and internet would also be made available in all schools for all teachers. Flexible, modular and online platforms for teachers will be created not only for their continuous professional development but also for sharing resources and ideas, the policy envisages. It further recommends strengthening all B.Ed. programs with training on recent advances in pedagogy, evaluation and educational technology. It proposes to utilise IT based technology for recruitment, promotion and transfer of teachers for bringing transparency in the system. In the chapter on school complexes, which is to combine a few nearby schools for better sharing of resources, not only technology will be used to share the resources in an effective manner but, the technology itself will be shared in a manner which is useful to all sections of the school complexes. In the chapter on governance and accreditation, the draft policy wishes to utilise technology for a more transparent system in place for admissions into schools (both government and private) to ensure fair entry for disadvantaged students in schools. It also foresees extensive use of technology in creating norms for accreditation and maintaining such a record in the public interests. The draft NEP-2019 might have suggested a more in-depth deployment of technology for the purposes of inclusive education and CWSN children.

As mentioned earlier the part II of the draft NEP-2019 deals with the Higher education. Technology has not been mentioned as explicitly in this part of the draft policy as has been mentioned in part I, dealing with the school education. However, it is obvious that there are several initiatives that the draft policy talks about are not possible without the use of technology. One of the areas in which the role of technology has been clearly delineated in the draft NEP is Open and Distance Learning (ODL). It talks about using technology to enhance the access and quality of ODL. In this regard, it further proposes to strengthen Massive Open and Online Courses (MOOCs) by enhancing its outreach

overseas as well and by ensuring quality courses on MOOCs. “Study in India” portal will be created to attract overseas students to come to India and study. To avoid duplication of efforts, all types of resources created for ODL/MOOCs will be shared through “online digital repositories”. In the context of accessing journals in libraries, the draft NEP avers that “the Government of India (GoI) will set up a mechanism, e.g., becoming a single buyer, for online access to journals for all public institutions in the country, so as to save on cost and improve access”. The draft NEP advises to provide best facilities such as computers, internet and institutional emails besides other things to faculty members. The draft NEP has recommended setting up of National Research Foundation (NRF) to boost the research in higher education institutions. The draft policy visualises four divisions in NRF presently. One such division will be on Technology while other divisions will be related to Science, Social Sciences and Arts and Humanities. It also advises Department of Education of the State Governments to focus on online education also for both pre-service and in-service programs. Use of ICT in teaching is also one of the suggested areas for faculty improvement programs in higher education. The draft policy also has a section each on legal education, healthcare education and technical education.

The nineteenth chapter, in the IIIrd part of the draft policy document, deals with the technology in education exclusively, cutting across all levels of education. It begins with establishing objectives of integrating technology in education appropriately, viz., i) to support teacher preparation, and development; ii) improve teaching, learning and evaluation processes, iii) enhance educational access to disadvantaged groups and iv) streamline educational planning, administration and management. Although draft policy has talked about bridging digital divide at several places in the document, it perhaps requires special mention in the chapter on technology in education. The draft policy identifies a few important concerns related to technology integration in education in the country. One such concern is the availability of the local expertise in resolving and maintaining hardware and software at remote locations. The draft also exhorts institutions to seek software solutions for issues plaguing institutions or systems and for that, it has also suggested a model to be adopted. Its suggestions range from identifying stakeholders to creating technological solutions to doing pilot study with these technological solutions and then scaling them up. The draft also calls for increasing usage of Free and Open Source Software (FOSS). It recommends setting up of a new autonomous National Educational Technology Forum (NETF) which will provide a platform for the “free exchange of ideas” to attain the above-mentioned objectives. It also lists approaches for integration of technology. Teachers’ opinion will be the key while integrating technology in education. The draft policy also recommends establishment of Centres of Excellence in Educational Technology at prominent universities. It has also suggested three-point guidelines for technology interventions. They are i) hardware-cloud-based commercial infrastructure, ii) software- FOSS will be preferred, iii) data- all public data will be owned by the government. Then the draft policy recommends extensive use of technology for teacher preparation and their professional development, in improving teaching, learning and evaluation, in enhancing educational access, and in streamlining educational planning and management. At the end of this chapter, it has also talked about disruptive technologies or innovations, which seek to alter the technological operations

significantly and replaces old markets with the new ones. In this regard, use of Artificial Intelligence (AI) or Virtual Reality (VR) or Blockchain in education has been talked about.

Chapter on Vocational Education visualises data gathering, MIS and technology support for rollout of vocational education. It also talks about offering certificate courses on the theoretical aspects of vocational courses through online. In the chapter on adult education, the draft policy emphasises on integrating digital literacy in the mainframe of adult education objectives and use internet - based online platforms as well, to achieve the objectives of adult education.

We would like IJET to act as a catalyst for generating debates and discussions on the draft National Education Policy, 2019 in the coming months. It is a pleasure to bring out the second issue of the journal which consists of a variety of sections having research, review and general articles. We hope that the enthusiasm of the fraternity for academic discussion will help us in bringing out the subsequent issues with more number of articles. We extend our appreciation to the authors for sending their works and the reviewers for reviewing those works by taking out time for such academic works. Most importantly, we would also like to thank the small editorial team of ours who have worked consistently for bringing out the current issue.

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