MOOCs a Renaissance in Indian School Education: Review in Context of SARS-CoV-2 and NEP2020

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Abstract

The education systems of all the countries of the worldhave faced unprecedented challenges due to Covid-19. India also sailed the same boat along with some of its inherent challenges of its education system like; poor access, disparity in access to different socio-economic sections of society, poor quality, based on information transaction, poor skill development, fragmented system and many more. In response to this,Indian schools had swiftly adopted emergency remote teaching. When Indian school system was being badly shaken with these turbulences, it had a ray of hope to combat all these challenges and the country came out with NEP 2020. Implementation of NEP 2020 and Covid-19 effects are going simultaneously. NEP 2020 is envisioning online education and MOOCs as panacea for most of these challenges and Covid-19 is also pushing Indian school education system for a shift to online mode of education. MOOCs arenovel educational phenomena gaining momentum and popularity worldwide due to its potential to address the issues of access, equity and quality. The article has critically discussed the impact of Covid-19 over Indian school education, along with the aspiration of NEP to radically transform the whole Indian education system. Various digital initiatives (ATLs, NEAT, DIKSHA, ePGPathshala, etc.) by MoE have been discussed. Article has also thrown light on NEP's vision of leveraging ICT in teaching and learning; and developing MOOCs as a new techno pedagogical innovation. The article also attempts to explore the real potential of MOOCs in addressing the issues of school education along with some inherent challenges.

Key Words: *Massive Open Online Courses, MOOCs, School Education, Online Education, SARS-CoV-2, Covid-19, NEP 2020.*

Vulnerable children: Indian Scenario

India is facing transformation in school education with the implementation of NEP 2020 and forced evolution of school education due to Covid-19. Although the changes in education systems have been continuous over a period of time, substantial and sudden transformation in education systems all over the world are being observed in the post-2020 period. The entire world is facing the biggest changes in education systems (UNESCO, 2020). Indian education system faced an irreversible learning crisis in this pandemic (Sharma, A, 2021). The Indian education system is facing a dual impact of distancing between teachers and students due to COVID-19 pandemic and the release of the National Education Policy, 2020 by the Ministry of Education recently (Saxena & Khandelwal, 2021). NEP is a very significant policy in the historyof the Indian education system. The release of the policy is a positive and fresh change amid the challenges due to Covid-19 and the consequent negativity prevailing in India (Kurien & Chandramana, 2020).

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At a stage when India was working on NEP 2020, the pandemic Covid-19 intervened. Because different countries are interconnected, the entire world faced the spread of Covid-19 which could not be stopped at international borders. It had drastically disrupted everywhere including India (Patil, Ghadge, Dhas, Moholkar, 2021). The countries grappled with the pandemic by putting restrictions on the mobility and lockdown periodically. It put an unprecedented test on the education systems of different countries. Moreover Covid-19 may lead to a likely slow rate of growth of Indian economy in the coming immediate future and it would badly affect the expenditure on education (NIEPA, 2020). UNESCO has declared education a universal and birth right of every born child and primarily focuses on equitable quality-based education and lifelong learning [Education-2030]. Indian school education has faced many challenges like: poor curriculum and instructional methods, shortage of teachers and lack of communication between teachers and students (Chahal, 2015) which have also been mentioned in NEP 2020. Sustainable Development Goal 4 of 2030 which has been already adopted by India in 2015 also aims to ensure inclusive and equitable quality education and promote life-long learning opportunities for all by the year 2030 (p. 3). For a developing country, like India, it has been a challenging task to provide its young, talented and aspiring minds an easy access to education based on equity and quality. NEP 2020 is envisioned as a policy to give a big leap to Indian Education with a tight grasp on the present Indian socioeconomic landscape and to combat immediate future challenges (Kumar, 2020).

Covid-19 Led a Move to Emergency Online Learning

Initially in March 2020, when India was to go for the first lockdown, Whatsapp helped school teachers to connect with their students. Education systems of almost all developing countries were badly shaken by sustained closure of educational institutions and international borders. School education system swiftly transitioned from traditional classrooms to online teaching. Online classes were used by different schools with the help of different platforms like WebEx, Google meet, Go to meeting, Microsoft teams, etc. With significant demand, there has been a rise in many online learning platforms which offer open and free access to the learning resources. And even for keeping people mentally stress-free they were to engage in online learning (Jena, 2020). During this period the educational community put concerted efforts for continuity of the teaching-learning process. Pandemic Covid-19 has forced scrambling of educational material and online platforms which have posed great threat to teaching profession and its autonomy (UNESCO, 2020). As per International Association of Universities (IAU),Covid-19 Global Impact Survey, 2020, 60 per cent of education institutions have gone through virtual mobility or collaborative online learning as an alternative option to face to face mode of teaching. As per OECD's recent Economic Outlook, the most optimistic outlook also endorses a major global recession (OECD, 2020). And this slowed down economic growth with spread of virus may influence the allocation of the budget for the education sector. This may also impact the slower rate of growth in budget yearly (AI- Samarrai, Gangwar & Gala, 2020). Education with digital platforms cannot be imagined without pedagogical concerns. It should also involve human relations between teachers and students. The teachers who were not equipped with ICT based pedagogy or not well versed with these online platforms had to struggle with conducting online classes (Tari & Amonkar, 2021). Now it has become very clear that the impact of Corona virus may be longer than it was expected. The continuous lockdown and social distancing forced the Indian education sector to evolve. Education is transforming drastically with a distinctive rise in online

education and teaching remotely with various digital platforms.

In India, learners from privileged backgrounds and those who were eager to learn made their way to alternative learning opportunities but the learners from disadvantaged backgrounds remained shut out when their schools were closed. The learners who already had barriers in accessing education like children with disabilities and from remote areas either had limited or no education and they lagged behind (UNICEF & UNESCO, 2021). It had ahuge impact on people medically, socially, and educationally; irrespective of grounds such as nationality, level of education, socio-economic status and gender. This pandemic forced the education system to move from traditional teaching learning process to emergency online teaching learning, and the children in poverty all over the world who had to rely on school for their educational material, uniform and even meals, suffered a lot. This pandemic exposed the inequalities which were inherent in our society and the poor ones were hit the most. The school education systems all over the world have to go for emergency online education. This also affected safety and legal status of international students in the host countries (OECD, 2020). With innovative teaching practices like ICT based pedagogy and MOOCs better curriculum and instructional methods can be devised (Radhika 2018).

NEP 2020: A Desirous Indian Education Policy

Manak (2020) stated in his research paper that education in India is not based on an efficient mechanism to ensure accountability and consistent performance of teachers. Unplanned expansion has ledto institutions with substandard quality. Tilak (2020) discussed in his research paper that education in India is facing excessive hike in student's fee and privatisation. Knowledge landscape in the world is undergoing change and the unskilled jobs may be taken over by the rise of big data, machine learning and artificial intelligence. With quickly changing employment and global ecosystem, India is to go with the recent call of Prime Minister Sh. Narendra Modi on leveraging the fourth Industrial Revolution for leading the country to new heights (Sreeramana & Shubhrajyotsna, 2020). Education in India needed to create learners with creativity and innovative abilities and to adapt and absorb new material in dynamic fields. India should go for an education system that can ensure equitable access for high quality education to all learners irrespective of any differences (NEP, 2020). National Education Policy is the first major policy which caters school education to higher education in the 21st century. It envisions delivering high quality education with universal access for maximum utilisation of human talent and resources for the welfare of humanity. Poor quality of teaching learning process, lack of motivation and enthusiasm among learners and mismatch between education delivered and demands of jobs and industry are some of the factors haunting Education (NEP, 2020). The vision of equitable and quality education has been hurdled by the existing huge regional diversity preventing many young learners living in remote and deserted lands, from gaining quality education. Covid-19 has also put many challenges in front of the Indian Education system and NEP 2020 is a ray of hope and it is expected to reshape the education system. NEP came at that time when decreasing GDP due to Covid-19 all over the world is a matter of concern (Kumar, 2020). India needs an education system which can overcome barriers of equity based access and quality education.

Significance of the Study

NEP2020 emphasises on making learning 'holistic, integrated, enjoyable and engaging' by bringing root level restructuring of school curriculum and pedagogy (p. 11). It focuses on the 'how to learn' approach and discourages rote learning. Curriculum shall

be made need-based, and to be transacted through new pedagogies, i.e., "inquiry-based, discussion-based, discovery-based, analysis-based". 21st century skills among learners shall be inculcated including critical thinking, creativity, collaboration and communication, problem solving, leadership, humaneness and sensitivity. Traditional education had become insufficient in all respects to meet these high demands. NEP has drawn its attention to integration of technology in all phases of education. It stresses ICT-based, internet-based learning making best use of available digital technologies and advanced pedagogies. MOOCs,one of the novel trends in the field of education, are recent educational innovations making learning highly interactive, enjoyable, engaging and useful as NEP suggests. They are breaking all constraints of traditional setup, like time, space, place, and cost. School education is a link to higher education which is further linked with social, economic development of a nation. A poor school education results in poor national development. Covid-19 has also severely impacted the offline delivery of education, demanding a new online approach for education. Therefore, designing, developing and validating MOOCs for school education to promote access, equity and quality of education is the need of the hour. The present paper has taken up the task of reviewing school education in the light of the vision of NEP2020 along with adverse effects of pandemics. The results of the study shall be significant to address the main issues of Indian School Education i.e. access, equity and quality. The findings shall act as inputs to develop MOOCs for better school education.

Objectives

- To study the current status of Indian School Education system in context of access, equity and quality.
- To study the intermixed effect of Covid-19 and NEP in reshaping Indian School Education.
- To discuss major educational (digital/ ICT) initiatives by MoE, GoI for School Education
- To explore potential in MOOCs for addressing issues of access, equity and quality in Indian School education.

Research Methodology

The present research paper adopted a descriptive research methodology. Various data sources involving use of different government websites (MoE, NCERT, and NIOS), official documents (NEP, UDISE), statistical reports, national policies and the available literature related have been explored and reported. Researcher's own professional experience also contributed to adding insight to the answers of the objectives / research questions.

Current Status of Indian School Education: UDISE+ Report 2021-22

Indian school education system is one of the biggest systems of the world having approximately 14.89 lakh schools, over 95 lacs teachers, and nearly 26.52 crore students from pre-primary to higher secondary level (p. 10). UDISE+ or Unified District Information System for School Plus provides up-to-date and authentic information about the school system for objective assessment and planning for further advancement. UDISE+ report provides us a status of school education in terms of enrolment, number of schools, number of teachers, number of students, gross enrolment ratio (GER), gender parity index (GPI), Pupil Teacher Ratio (PTR), etc.

As per the report, total enrolment for the year 2021-22 from pre-primary to higher secondary level was nearly 25.57 crore which is 19 lakhs more than the previous year. The report has shown a decline in the number of teachers by 1.95 per cent. Total number of teachers has decreased from 97.87 lakhs in 2020-21 to 95.07 lakhs in 2021-22. The GER of primary level was 101.3 per cent in the year 2018-19 which increased to 104.8

per cent in the year 2021-22. The GER for upper primary is 94.7 per cent in 2021-22 which increased from 87.74 per cent in 2018-19. The GER for secondary schools has reached 79.6 per cent in 2021-22, from 76.9 per cent in 2018-19. GER at higher secondary level has also shown improvement as it attained a level of 57.6per cent in 2021-22 from previous 50.14 in 2018-19 showing significant increase. GPI is in a balanced position at nearly 1 or slightly over 1. The PTR at all levels of school education is showing a good improvement from the year 2018-19 to 2021-22. Other parameters of school education, namely, infrastructure, books, facilities, have also shown a good improvement.

We can conclude that the quantitative changes in school education are on a positive track, except access (GER) at secondary and higher secondary level is far below than maximum. There is a great lack of qualitative changes (teaching, learning, assessment, values, etc.) as NCFSE2023 highlights basic restructuring in school curriculum to bring quality in education in schools. Quality is a chief concern before education stakeholders that the present article seeks to explore.

Emergency Remote Teaching due to mixed impact of Covid-19 and NEP 2020: Reshaping Indian School Education

India is emerging as a young nation with an average age in the range of 15-29 (Ministry of Youth affairs, 2014, p.10). It has a strong dearth of formally skilled labour force which presently stands at2 percent and far below the developed nations (Ministry of Labour and Employment, Report 2014, p.4). The main goal of our school system is to provide all the children of school-going age access to the schools. Through some major initiatives like Sarva Shiksha Abhiyan which is now named as Samagra Shiksha and RTE Act, Indian School System is moving towards universal enrollment but at later levels in school education serious concerns are raised in retention of students. There has been a significant steep drop out after grades 5 and 8 (NEP 2020). COVID-19 affected teaching and learning in schools, with two-thirds of them reporting that classroom teaching has been replaced by distance teaching and learning. The shift from face-to-face to distance teaching did not come without challenges, the main ones being access to technical infrastructure, competences and pedagogies for distance learning and the requirements of specific fields of study. Covid-19 not only interrupted teaching but also assessment. Many exams all over the world has been postponed or cancelled. Traditional exams have been replaced by online exams. As it was a new area both for teachers, learners and administrators; so, in assessments, larger measurement errors have been observed than usual. The learners at all the stages faced cancelled practical experiences and apprenticeships (UNESCO, 2020). This forced move to online learning with no training, poor connectivity, less prepared system resulted in serious concerns for education in general and online education in particular; poor user experience, poor mental health both for the teachers as well as for learners (OECD, 2020).

With adequate infrastructural facilities, appropriate use of ICT and making school education engaging the Gross Enrollment Ratio be increased to 100per cent. For children belonging to poor socio-economic status, Open and Distance Learning Programs by NIOS and other State Open Schools can be strengthened and expanded. Use of technology will help in strengthening the Open School System. Restructuring the school system, Curriculum and Pedagogy to5+3+3+4, focusing on skill-based education, enhancing flexibility in selection of subjects especially at middle school stage, including multilingualism have been the main proposed transformations as per NEP 2020. All the proposed transformations can be strengthened by the use of technology.

Digital Initiatives in Indian School Education

NEP proposes the use of digital technology

to enhance the learning experience of students. This includes the creation of e-content that can be accessed by students online, the development of digital libraries and repositories of educational resources, and the use of online courses to supplement classroom learning. The NEP proposes that digital technology be used to create a more personalised learning experience for students, where they can learn at their own pace and in a manner that suits their individual learning style. This is in line with the growing importance of digital skills in the modern world and the need to equip students with the skills and knowledge required succeeding in the digital economy. The NEP proposes several digital initiatives to achieve this goal.

NISHTHA as a digital program covers various aspects of education, including pedagogy,curriculum design, assessment and evaluation, and classroom management. The program is designed to cater to the needs of teachers at all levels, from primary to secondary, and across all subjects. The training is provided through an online portal that includes interactive modules, videos, and other learning resources. One of the key features of NISHTHA is its focus on digital technologies. The program includes modules on the use of digital technologies in education, including the use of online tools for teaching and learning, creating digital content, and using social media for educational purposes. The program also provide straining on the use of digital tools for assessment and evaluation, which can help teachers track the progress of students more effectively and provide personalized feedback(Gulam Hussein, 2021).

NEAT (National Educational Alliance for Technology) is a digital initiative launched by the Ministry of Education, Government of India, to provide a platform for educational institutions and Edtech companies to collaborate and develop innovative solutions for the education sector. The initiative aims to promote the use of technology in education, improve learning outcomes, and increase access to quality education across the country. NEAT provides a platform for Edtech companies to showcase their products and services to educational institutions across the country. The platform includes a wide range of educational resources, including e-books, audio-visual content, online courses, and educational Apps.

Educational institutions can access these resources and integrate them into their teaching and learning processes. One of the key features of NEAT is its focus on adaptive learning. The platform includes AI-powered tools that can analyse the learning patterns of students and provide personalised learning experiences. These tools can help identify the strengths and weaknesses of students and provide targeted interventions that can help improve their learning outcomes.

Atal Tinkering Labs (ATLs) is a flagship scheme launched by the government of India to promote innovation, creativity, and entrepreneurship among school children. The initiative ispart of the Atal Innovation Mission (AIM), which is aimed at promoting innovation and entrepreneurship in India.

ATLs are innovation workspaces set up in schools across India to provide access to state-of-the-art technology and equipment, such as 3D printers, robotics kits, and Internet of Things(IoT) kits, to students from Classes VI to XII. The labs are designed to foster a culture of innovation and entrepreneurship among children by providing them with the opportunity to explore and experiment with various technologies and develop innovative solutions to real-world problems. The ATL initiative is a major step towards promoting a culture of in novation and creativity among school children in India. By providing access to state-of-the-art technology and equipment, the initiative can help children develop critical thinking, problem-solving, and design thinking skills, which are essential for success in the 21st century. TheATL initiative has been a huge success since its launch, with thousands of schools across India setting up innovation labs under the program. The initiative has

not only provided a platform for children to showcase their innovative ideas and projects but has also helped create a pipeline of young entrepreneurs who can contribute to India's economic growth and development in the future.

DIKSHA (Digital Infrastructure for Knowledge Sharing) is a digital initiative launched by the Ministry of Education, Government of India, in 2017, aimed at providing quality e-learning content to teachers and students across India. The initiative is part of the government's efforts to promote digital education and make high-quality learning resources available to all,especially those in remote and under served areas. DIKSHA is a multi-channel digital platform that provides access to various types of e-learning resources, including textbooks, lesson plans, assessment tools, interactive videos,and quizzes. The platform is designed to support teachers in their classroom teaching and help them develop engaging and interactive learning experiences for their students. The platform is accessible through various channels, including web, mobile App, and offline mode, making it easy for teachers and students to access the resources anytime, anywhere. Teachers can use Diksha to create their own content and share it with their students, while students can use the platform to access learning resources and track their progress.

E-Pathshala is a digital platform that provides access to various types of e-learning resources,including textbooks, audio and video lectures, e-books, and interactive e-content. The platform is designed to support students in their learning and help them access quality educational resources anytime, anywhere, using a mobile App or web-based portal. The platform also provides access to subject-specific resources for different levels of education,such as primary, secondary, and higher education. It also offers resources in multiple languages, making it easier for students from diverse backgrounds to access quality educational content.

The government of Haryana has launched a scheme called e-adhigam to provide tablets to students in government schools. The initiative aims to improve access to digital learning resources and promote digital literacy among students. The tablets are pre-loaded with educational content and distributed to students in a phased manner starting from 5th May,2022 with a distribution of 5 lakh tablets.

NEP Envisions Integration of ICT in School Education

India, after facing a digital crisis in the field of education in pandemic times, paved her path through the digital education by some standard steps taken to bring the education fraternity close to technology and digitalisation. School education, being a high volume area of learning, has the highest target population. As per the AISES report published in 2016 covering 12,99,902 recognised schools, 79,036 primary schools were running in non-pucca building whereas more than 11,000 schools were running without any building. The report briefly defines the state of Indian schools in 2016. After a long chain of quality initiatives like SWAYAM, PRAGATI, ISHAN-UDAY, NISHTHA, DHRUV, EQUIP, NEAT, GIAN, SSA,RMSA etc. at different levels, India came to a position where it could effectively boost the learning of the students through digital learning methods (Chakraborty, 2022).NEP-2020 envisions for the bright future of school education in India. One of the key aspects of the NEP is the emphasis on the integration of Information and Communication Technology(ICT) in school education. The NEP envisions the use of ICT as a tool for enhancing learning outcomes and improving access to education. The NEP recognises that technology has become an integral part of our daily lives and that it can play a significant role in transforming the way we learn and teach. The policy document emphasises the need to provide students with access to digital tools and resources that

can help them learn better and prepare for the challenges of the 21st century. The NEP also recognises that the use of ICTcan help bridge the digital divide and provide access to quality education to students from all backgrounds. NEP proposes the creation of a National Educational Technology Forum (NETF) that can serve as a platform for collaboration between different stakeholders in the education sector. The NETF will be responsible for identifying emerging technologies that can be used in education and developing strategies to integrate them into the curriculum. NEP emphasises the need to provide students with access to digital devices and high-speed internet connectivity. The policy document recognises that access to technology is a key factor in ensuring that students can benefit from digital resources and tools. The NEP proposes the creation of a digital infrastructure that can support the use of ICT in education, including the development of e-content, digital libraries, and online courses. The use of technology to personalise learning and provide students with individualised learning experiences is one of the foresights of NEP-2020. The policy document recognises that students have different learning styles and abilities and that the use of technology can help teachers create learning experiences that are tailored to the needs of each student. NEP envisions the integration of ICT as a key component of school education in India. The policy document recognises the potential of technology to transform the way we learn and teach and proposes a number of measures to make this vision a reality. By providing teachers and students with access to digital tools and resources, and by developing strategies to effectively integrate technology into the curriculum, the NEP aims to create a more inclusive and equitable education system that can prepare students for the challenges of the 21st century.

MOOCs as a Renaissance in Indian School Education

The education system must work for enhanced human interaction and their well-being. Education technology should be used in a way to promote learning across distance, communication and collaboration. And this shift to online remote learning will eradicate inequalities (UNESCO, 2020). Digital devices have helped in liberation of learning from fixed geographical locations to anywhere in the world. With the help of sophisticated e- learning technologies and pedagogic approaches MOOCs have the potential to provide equality as their reach is for global participants (Jordan, 2014). On the review of the experiences of open learners, MOOCs attract diverse learners on the basis of geography, culture and academic backgrounds (Levy, 2011; Kop, 2011; Rodriguez,2012). And in the context of the Covid-19 pandemic crisis, the interest and enthusiasm in digital learning technology has increased exponentially (UNESCO, 2020). Traditional classroom learning experiences have been found inadequate to meet our growing learning requirements of 21st century school learners. It is high time to plan well and sincerely execute such a mechanism which can overcome the barriers of access, equity and quality which are haunting the visions of higher education in India (NEP, 2020). NEP 2020 advocated for the development of youth who are thoughtful, well-rounded, and creative individuals. Policy stresses on development of learners with “intellectual curiosity, scientific temper, creativity, spirit of service and with 21st century skills, productive contribution to society, constructive public engagement”.

Chea (2016) developed an insight into the fast changing trends in the field of education through his writings; one of them is “Benefits and challenges of massive open online courses.” He regarded MOOCs as the most novel, recent and innovative with respect to education. The paper explained about the massiveness of MOOCs in terms of its applicability to a huge number of learners

without any barrier of time and place but dropout rate is a challenging issue on one hand whereas overall cost of designing and developing MOOCs is also very high. Rolfre (2014) in his study stated that traditional education is mainly overcrowded with outdated teaching methods and pedagogies which failed to meet the diverse needs of 21st century learners.

MOOCs have revealed their abilities to overcome various barriers of traditional education by replacing obsolete methodologies, practices, attitudes and systems by advanced and practical teaching learning methods, high pedagogies, creative assessment tools, and developmental attitude. MOOCs are in line with the NEP's vision of integrating technology with content and pedagogy to make teaching learning as per requirements of 21st century India.

Challenges before MOOCs: A Quick View

It is equally important to take into account some barriers before successful implementation of MOOCs in Indian School Education. AICTE has considered language as a barrier in equity-based access to MOOCs for learners from rural areas (Pant, Lohani & Pande, 2021). Teachers also faced barriers during online teaching and assessments; lack of facilities, interruption of family during teaching, lack of institutional support for purchase of tools, lack of training, lack of technical support and lack of clarity and direction during Covid-19 (Joshi, Vinay, Bhaskar, 2020). The studies on assessment in MOOCs reveal that MOOCs lack assessment on psychomotor and affective levels of domains (Sandeen, 2013). Adhikari and Semalty (2021) studied SWAYAM platform and stated that many courses on SWAYAM lacked utilitarian aspect for learners and suggested more need based MOOCs and advocated the need of training for MOOCs developers for delivering the content on digital platform with pedagogical expertise. Murthy et al. (2018) discussed that more efforts should be put in designing, delivering and transacting the digital content for enhancing effectiveness and engagement in MOOCs. It will help in increasing the success rate of MOOCs in India. Long time back Kothari Commission (1964-66) and even now NEP (2020) also recommended 6 per cent of GDP for education. Different infrastructural limitations, issues of connectivity and technological support system can be overcome by going with and fulfilling this long wish of policy planners (p.186). Technological barriers, digital literacy and language also pose challenges in participation in MOOCs (Pouezevara & Horn, 2016). In developing countries like India, e-learning technology gives an opportunity to provide education to middle and lower income sections of society (Aggarwal, Sharma, Kumar.et al. 2021).

Potential in MOOCs: A Panacea for School Education

Recent years have endorsed the hike in enrollment in MOOCs by Indian students all over the world and India is the leading country in terms of enrollment in courses by most popular MOOCs providers like Coursera, Udacity, edX (Jyoti Chauhan, 2017). As per the research by Harvard and MITx in 2014, 10.5 million of Coursera students were from Indian origin and it made Indian students the second largest community of online learners. Powell and Yuan (2013) stated that MOOCs are open in terms of curriculum, learning pace and assessment process. MOOCs have the potential to address the challenge of accessibility by being accessible to everyone irrespective of the differences in learners in terms of culture, language, gender and religion. MOOCs also support the idea of lifelong learning as it equalizes the learning opportunities for the learners of all age levels (Bordoloi, Das & Das, 2020). MOOCs are proving to be bliss for those learners who have not been a part of the mainstream education system. This also bridges the gap which prevented many learners from accessing the educational system (Nayak, 2019). MOOCs have emerged as an innovative mode of teaching not only in

India but all over the world. On the basis of review trends and statistics on MOOCs, the tremendous hike in enrollment in MOOCs was seen in year 2020 with five times enrollment in Coursera courses and doubles the enrollment in edX courses if compared with 2019 enrollment (Shah, 2019). India is the 2nd biggest market for MOOCs in the world following US. India's population is second to China's and India is 3rd in term of university enrolment worldwide after US and China respectively. The demand for school education is increasing day by day which alone cannot be met by traditional structure of education. Only MOOCs are a ray of hope for those who could not join regular mode of study because of high fee, inflexibilities, and many other reasons.

During the pandemic period, India has witnessed a large number of ICT based initiatives on national, regional, state and individual levels and many such initiatives are there which contributed in making education accessible to learners in remote areas (Sharma, 2021). One of such initiatives is SWAYAM and the number of learners registered on it has also increased significantly in the last 2 years as a requirement to learn online in the period of covid-19. MOOCs have the potential to meet the learning needs of school (as well as university) students enrolled in regular and distance education. More than 3.85M students are enrolled in regular education and more than 4.28M students have opted for distance mode of education (AISHE, p. 22).

Discussion and Conclusion

The period following this pandemic is going to reshape Indian school education significantly. It is a call for mobilisation and participation of all the stakeholders in working for futures of school education. Education has a major role to play for India's fast growing and developing economy. In such a scenario, overcoming the barriers of access, equity, quality and relevance has become the dire need of the hour. NEP suggests development of digital infrastructure in terms of digital classrooms and remote expertise based teaching models to bridge gaps in face to face teaching and laboratory infrastructure, which is a big challenge because most of the institutions don't have adequate setup to support these tools (Venkateshwarlu, 2021). NEP 2020 recommended that e-courses or online courses should be made available in regional languages specifically in eight major Indian languages (Kurien & Chandramana, 2020). The Indian Government is to play a leading role in strengthening the backbone of e- learning by deploying adequate infrastructure at remote places where people lack access to the internet and devices (Tari & Amonkar, 2021).

A new hybrid model of education may emerge with significant advantages both for the teachers and learners. This move to online learning will become a catalyst for the development of new and more effective methods and pedagogy. It will be achieved if some research inputs from educational researchers are added to it. Researchers in the discipline of education may work for evolving pedagogy for online education or it can be the other way round like first we plan pedagogy and content then we select appropriate ICT platform for its delivery and transaction. The concept of the Technological Pedagogical Content Knowledge (TPACK) needs to be an integral part in training of teachers, and they must be trained to deliver content with appropriate pedagogy. For smooth and effective online education in India, low-cost internet facilities may be provided to people. Teachers need to be adequately trained to become effective online educators. A good offline teacher may not be an effective online teacher. In the era of industrial revolution 4.0 and for a professional teacher TPACK competency is required (Agustini, Santyasa & Ratminingsih, 2019). Content centric approach should be used in professional training of teachers. It advocates for teaching teachers how to teach the content by using adequate tools

and technology (Harris 2005, 2008; Mishra & Koehler,2007,2009; Niess, 2005). Online education must include experiential and activity based learning to include affective and psychomotor domain of learning (Panditrao & Panditrao, 2020). For the disadvantaged people for whom digital access is highly limited, the use of mass media like television, radio and community radio can be extensively utilized (Panditrao & Panditrao, 2020).

Development of digital content, delivery mechanisms and assessment systems with thoughtful integration of adequate technology with pedagogies may be fruitful and India can be a global MOOCs provider too. MOOCs have such features and capabilities which can be effective in reshaping Indian school education. MOOCs have the potential of removing barriers like poor infrastructural facilities, low access, inequality, high cost, discrimination and low quality education. Carefully designed MOOCs by experts and trained professionals may bring transformation in Indian education by overcoming the shortcomings of traditional setup. The existing and ongoing MOOCs can be critically reviewed by experts on some specific parameters. It is the right time for India to plan well and implement a robust mechanism for its school education which can overcome its challenges and barriers. Then equity-based access and quality education can be realised for 21stcentury India.

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