

TRANSFORMATION IN ONLINE EDUCATION IN INDIA IN CONTEXT OF SARS-COV-2 (COVID19) AND NPE-2020

Vidyanand Malik (Main-Author)

Senior Research Fellow,

Department of Education, Maharshi Dayanand University, Rohtak, 124001

vidyanand.rs.edu@mdurohtak.ac.in

Dr. Madhuri Hooda (Corresponding Author),

Associate Professor,

Department of Education, Maharshi Dayanand University, 124001

hoodamadhuri.rs@mdurohtak.ac.in,

ABSTRACT

World has witnessed a complete lockdown in educational institutions during covid-19 pandemics. There was a severe learning crisis in many countries including India. Existing e-learning formats could not meet the increased demands of the learners community. Students' learning outcomes, interaction, satisfaction and engagement level was acutely affected and thereby demanded innovations and extensions in existing online learning tools. Same year, India witnessed new education policy 2020 envisioning equity and quality based higher education to produce creative and global individuals. Policy set global hallmarks to achieve in the field of education, research and innovation. It proposes integration of latest technology with advanced pedagogies for students' better learning outcomes and experiences. On one hand, policy promised utilization of digital technology in all phases of teaching, learning and assessment, and on other hand, covid-19 challenged traditional mode of learning and stirred the phenomena of technological advancements in online education. The paper discusses the pressing need of advancements in existing online education format to solve challenges posed by pandemics and the dream set forward by policy, 2020. Paper also throws light on various digital initiatives taken up by Indian govt. in line with education policy and to foresee challenges in the field of online education as casted by pandemics.

Keywords: NPE-2020, online education, covid-19, pandemics, educational technology, higher education, moocs.

Introduction

Universal quality education is one of the chief concerns of the new education policy (NPE-2020). India has a rich pool of human talents, and resources that have not yet been utilized for national good in the lack of equity based qualitative and relevant education. Diversity, in terms of geographical dividend, languages, religions, beliefs, and culture, is one of paramount characteristics of India. Therefore, policy stresses the high need of quality education to develop and maximize the talent and creativity of young learners for individual betterment, social coherence, national unity and international understanding. UNESCO has also, in its agenda of Sustainable Development (2030), strived to achieve the goal of "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (p. 3). With the invention of internet technologies in the beginning of the 21st century, almost all walks of life have undergone drastic change, education is no exception. Satishkumar et al. (2020) concluded in their studies that break of pandemics (COVID-19) has accentuated the need of online learning in almost all phases of education and educational institutions worldwide. Traditional set-up of teaching-learning was challenged to meet the educational needs of learners in the lockdown period. Institutions quickly resorted to e-learning for continuing education of their students. E-learning is regarded as a new form of online education based on ICT i.e. information and communication technology (Moore et al., 2011). Teachers, educators, and other stakeholders are eager to know how e-learning can enhance learning outcomes. The need for adaptation and updation in traditional education was realized with the onset of the rapid advancements in technology. Learners of today need to learn at any time, and any place as per their convenience (Wolfinger, 2016). Online education proved to be a panacea for the education community during the lockdown period when face-to-face education was impracticable. It is crystal clear as to how covid-19 situation catalyzed the pace of online education to carry on with teaching learning. Policy envisioned leveraging educational technology for escalating access, equity and quality in higher education specifically. Developing nations, like India, faced a severe learning crisis in the pandemics time owing to their inability to fastly adopt technology in education. Paper discusses a pressing question resulting from convergence of new education policy, covid-19 pandemics, and evolving online education. It reviews online education as a new era in Indian education promising to work out the challenges posed by pandemics and vision set by NPE-2020.

Objectives

The paper seeks to:

1. To review policy's vision for Online Education.
2. To study the impact of pandemics on online education.
3. To study various digital initiatives taken up by the government of India.
4. to study and discuss the potential of Online Education.

Research Methodology

Methodology of this research paper is descriptive in nature and spirit. It is based upon the review of various related studies, new educational policy, and various government documents. Personal experiences of researchers as educators have been a great source of enlightenment for the present paper.

Outbreak of Covid-19: Paving Way for Quality Online Education

Covid-19 pandemics in 2020 caused an unprecedented situation throughout the world forcing the education systems to switch to online learning and teaching. Closure of educational institutions and suspension of classroom learning teaching created a gap in students' learning. Technological advancements and internet technologies have changed the lives of people immensely, especially in education (Nadikattu, 2020). Many countries over the globe temporarily closed educational institutions to prevent the spread of the COVID-19 virus. As per UNESCO (2020) data report, around 191 nations have imposed national or local school lockdowns, resulting in a huge number of students (over 91%) enrolled in schools not being able to go to school as of April 20, 2020 (Lamrabat, 2020). UNESCO has supported such countries in efforts to counterbalance the instant effect of schools closures, especially for comparably more vulnerable and disadvantaged societies, and to ensure the continuity of education for all through distant and online learning (UNESCO, 2020). The continuous shutting down of around 1.5 million schools nationwide due to the covid-19 has affected nearly 247 million students enrolled in elementary and secondary schools in India (UNICEF, 2021). Digital divide across Indian vast land is the main factor for disruption in teaching learning during pandemics. Many evidence and research reports indicated the impact of COVID-19 as most severe among the learners from vulnerable groups (women, SC, STs, children, aged, poors, minorities, etc.) as they cannot afford technology due to their poor economic condition. Continued lockdowns caused severe learning crises and gaps among learners belonging to vulnerable sections of society. Resorting to online mode of educational delivery was the only alternative to save learners from such a learning crisis. Though students engaged in sudden online learning for longer times suffered from physiological problems and psychological stress, suggest some studies, we cannot deny the potential of online education to provide qualitative education to learners (Goswami et al., 2021). The Indian government too adopted online education for compensating learning loss by providing e-content, virtual interaction (though limited) and learning tools; all these techniques have limitations too. We can conclude that there is a dire need of developing online education platforms, learning tools, applications and software, quality digital content, quality interaction and assessment forums, etc. to solve the threats posed by pandemics and similar situations that might be caused in near future. Let us discuss more inputs necessary for evolving qualitative online education as suggested by NPE-2020.

National Education Policy 2020: Much Anticipated Silver lining

The Year 2020 also had a positive breakthrough with the intervention of National Policy on Education 2020. It re-imagined the educational landscape in India through equity, inclusion and quality in education. The Year 2020 started with unprecedented tests on the education system of the country and the policy seemed as a silver lining (Acharya, 2020). It also pointed out some of the issues and concerns of Higher Education which need to be addressed in the Post-2020 period. These issues include: "a severely fragmented higher educational ecosystem; less emphasis on the development of cognitive skills and learning outcomes; limited access particularly in socio-economically disadvantaged areas; with few HEIs that teach in local languages; limited teacher and institutional autonomy; lesser emphasis on research at most universities and colleges; lack of competitive peer reviewed research funding across disciplines; suboptimal governance and leadership of HEIs; and an ineffective regulatory system, and large affiliating universities resulting in low standards of undergraduate education". These issues have been significant barriers in achieving the parameters of quality in higher education. NPE-2020 envisions its learners to cross these barriers and inculcate in themselves 21st century skills. The policy aims for equitable and inclusive education with emphasis on education for socially and economically disadvantaged groups which includes different identities; socio-cultural, geographical and disabled groups. It envisions increased access, equity, and inclusion in higher education through a range of measures. Being based on the foundation of accessibility, equity, quality, affordability and accountability, the policy aims at changing the country into a vibrant hub of knowledge (Acharya, 2020). Extensive use of technology and online and digital education has been suggested to overcome the barriers and challenges. In order to enhance use of technology in education an autonomous body National Educational Technology Forum will be made to create a platform for exchanging the

ideas on use of technology freely. More emphasis will be given on better adaptation and integration of technology based platforms like SWAYAM and Diksha. Technology should be used extensively in the teaching learning process, and online and digital education must address concerns of equity. Removal of linguistic barriers and enhancing access for divyang students should be of prime concern (Panditrao & Panditrao, 2020). India has the highest number of youths in the world who will decide the fate and future of the country if they are provided with quality and equity based educational opportunities. Core focus of the new education policy is thoughtful amalgamation of innovative technology and new pedagogy for enhanced learning experiences and to pave the way for quality education.

Policy-2020 Envisaging Digitalisation of Education

NEP-2020 emphasizes experienced-based, child-centered pedagogy for quality learning. Learning should be interactive, useful, engaging and interesting as learners are active constructors of their own learning. ICT-based education will optimize learning outcomes and experiences. Policy looks forward to judiciously mixing technology with content for engrossing learners in creative tasks. Among such technological innovations are MOOCs, a recent techno-pedagogical invention in online education. Policy suggests plans for developing more digital platforms and revamping the existing online platforms (NEP, 2020). Online education (MOOCs, etc.) is a means by which the teaching-learning process is carried out by providing open access to unlimited participants over the internet. It has removed the barriers of distance and time by facilitating a large number of learners around the world to access course material at any time of the day (Kurien & Chandramana, 2020). Pervasiveness of technology has affected the way the learners learn (Prensky, 2005) and also the way the teachers teach (Becker, 2000, Ingram, Willcutt & Jordan, 2008). MOOCs are the recent intervention in ICT based pedagogy and online learning (Trehan, Sanzgiri & Li, Wang & Joshi, 2017). MOOCs are massive in nature and cater to diversity in several aspects like; cultural, socioeconomic, demographic, etc. India is in a stage of massification of higher education. The developing and underdeveloped nations which have very limited resources can now embark upon massification of educational programs with quality online education. In addition to an increase in enrollment in higher education, NPE-2020 aims to enhance access opportunities by catering to specific segments of the society (NIEPA, 2020). Large number of learners irrespective of their geographical location can access and participate in MOOCs (Bozkurt, Ozbek & Ritcher, 2017). One of the aims of NEP is to utilize technology in education and considers e-learning as the need of the hour. Policy also mentions creating the National Educational Technology Forum (NETF) which can be used as a platform for exchanging ideas related to technology (Kaurav, Rajput, & Baber, 2019). NPE-2020 envisions that GER, equity based access and quality of higher education can be ensured with Online courses. Since the introduction of MOOCs in education all over the world, India has also taken the lead role in enrollment in MOOCs and also as a MOOC provider. The first initiative in this direction was taken by IIT Bombay in July 2004 by offering three open courses with an enrollment of around 35000. Birla Institute of Technology and science in collaboration with Harvard and MIT developed MOOCs with edX in 2014. India continued to develop MOOCs for different levels of education and worked for its indigenously developed MOOCs delivering platform SWAYAM. It was launched by the Ministry of Education in July 2016 with an aim of achieving three cardinal principles of higher education; access, equity and quality in higher education. Development of such digital platforms has the potential of eradicating the barriers of equity-based quality education and many other demerits of traditional education systems. Revamping and transformation in higher education is possible with carefully designed ,developed and validated MOOCs.

Various Digital Initiatives Taken by GoI: An Era of Online Education

The Government of India working in conjunction with the Ministry of Education has visioned transforming India into a global knowledge super power. It has laid its prime focus on development of educational technologies to be effectively utilized in teaching and learning across Indian classrooms. GoI has taken up several initiatives to boost up the genda of qualitative education with technological interventions.

1. **National Mission in Education through ICT:** Government of India has committed to accelerate GER of higher education by ensuring access, equity and quality of higher education for masses who have remained untouched by mainstream education. National mission in education with ICT seeks to provide high quality digital content, connectivity to institutions, and thereby lowering the digital divide.
2. **SWAYAM (Study Web of Active Learning for Young Aspiring Minds):** It is an indigenously developed digital platform designed by Government of India to achieve three cardinal principles of education i.e. access, equity and quality. SWAYAM hosts e-learning content for class starting from 9th to post-graduation. Content is designed by the best faculty of India in an interactive and interesting format. Content is available all time, everywhere and for free.
3. **NPTEL (National Program on Technology Enhanced Learning):** NPTEL was designed collectively by IITs and IISc in 2003, funded and supervised by the Government of India. It is the world's largest repository of videos for engineering, basic sciences, and some humanities and management courses. Its

main aim is to facilitate qualitative engineering education to all corners of India at affordable cost or free. NPTEL promotes the idea of quality online education.

4. **Swayam-Prabha:** Swayam Prabha, another important initiative, contains a group of 34 DTH TV channels dedicated to broadcasting quality-based educational programmes for a variety of courses on 24by7 basis with the help of GSAT-15. Content is repeated all the day so that learners can watch their desired program as per their convenience.
5. **MOOCs (Massive Open Online Courses):** MOOCs are asynchronous teaching learning platforms which contain educational content in a variety of formats as pre-recorded lectures, related resource videos, lecture notes and pdf, assignments and tasks, discussion forum, self assessment tools. MOOCs gained popularity during pandemics as learners found it easy, convenient and economic to access moocs as per their choices.
6. **National Academic Depository (NAD):** NAD is a 24 hours online store house of academic documents i.e. certificates, degrees, diploma, marksheets, etc. duly digitized and signed by concerned institutions. NAD not only makes access and retrieval of documents easy but also it validates its authenticity and safety. Anyone from anywhere can access and download their academic documents as per needs.
7. **National Digital Library (NDL):** NDL is a single window platform where one can access educational resources (books, articles, audios, videos, etc.) lying anywhere in India.
8. **Some Other Initiatives:** Apart from these major initiatives taken up by GOI to bring quality in education by integrating technology with education, some other important ones include e-Shodh Sindhu, e-Yantra, e-Kalpa, Vidwan, Shodhganga, Spoken tutorial, GIAN (Global Initiative for Academic networks), IMPRINT, Digilocker, e-PG Pathshala, etc. All the digital initiatives have worked toward bringing excellence and quality in education.

It can be accepted that there have been a flood of digital initiatives taken by the ministry of education and govt. of India in the field of online education. New pedagogies and technologies coupled with these initiatives have brought significant impact on teaching and learning practices, especially post-covid19 scenarios. Various studies have also revealed some sort of deficiencies in digital platforms like swayam, swayam prabha, etc. in terms of poor pedagogical concerns, low content quality, lack of interactivity, poor assessment and discussion forum, and others. It is equally true that exposure to lockdown situations has forced existing online education formats to work out their deficiencies and to meet the increased educational demands. There is a combined impact of education policy thrust, pandemics demands, and inertia of traditional education that brought forward a slogan of quality online education (MOOCs, Hybrid learning, Blended learning, etc.). The potential of online education to realize policy vision can not be under-estimated in the near future. It is pertinent to discuss the reality of existing online education scenarios, especially MOOCs, and to establish its true essence in Indian Higher Education.

Skepticism for Online Education as a Renaissance in Indian Higher Education: Myth or Reality?

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 Online Education has 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 pandemic Covid-19 crisis, the interest and enthusiasm in digital learning technology has increased exponentially (UNESCO, 2020). Traditional classroom learning experiences have been found inadequate to meet growing learning requirements of 21st century 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). Chea (2016) developed an insight into the fast changing trends in the field of education through his writings for an article on “Benefits and challenges of massive open online courses.” He regarded MOOCs as the most novel, recent and innovative with respect to education. Paper explained about the massiveness of Online Education 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 Online Education 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. The same teaching methods and pedagogies are scaled up in Online Education which result in low outcome and high dropout rate in MOOCs. AICTE also considered language as a barrier in equity-based access to Online Education 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 times (Joshi, Vinay, Bhaskar, 2020). The studies on

assessment in MOOCs reveals that MOOCs lack assessment on Psychomotor and affective levels of domains (Sandeem, 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 online education and advocated the need of training for online education 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 online education. It will help in increasing the success rate of online education in India. Long time back the Kothari Commission (1964-66) and even now NEP (2020) also recommended 6% 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 online education (Pouzevara & Horn, 2016). In developing countries like India, e-learning technology gives an opportunity to provide education to middle and low income sections of society (Aggarwal, Sharma, Kumar, et al. 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). 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 online education is open in terms of curriculum, learning pace and assessment process. Online education has 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. Online education also supports the idea of lifelong learning as it equalizes the learning opportunities for the learners of all age levels (Bordoloi, Das & Das, 2020). Online education is proving to be bliss to 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). 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). Online education must include experiential and activity based learning to include affective and psychomotor domain of learning (Panditrao & Panditrao, 2020). Moreover, by providing acquaintance and training in online teaching and learning both to the teachers and learners will make India higher education a world class higher education (Kantipudi, Moses, Aluvalu, Rajanikanth, Golyalla, Goud, 2021). For the disadvantaged group of people who have limited digital access, the use of mass media including tv, community radio, etc. can be extensively utilized for their better education and learning (Panditrao & Panditrao, 2020).

Conclusion:

MOOCs (as one facet of online education) 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 double the enrollment in edX courses if compared with 2019 enrollment (Shah, 2019). India is the 2nd biggest market for MOOCs in the world following the US. India's population is second to China's and India is 3rd in terms of university enrolment worldwide after the US and China respectively. The demand for higher education is increasing day by day which alone cannot be met by traditional structure of education. Only quality based online education is a ray of hope for those who could not join regular mode of study because of high fees, 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. Online education has the potential to meet the learning needs of 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). The slogan of qualitative online education can be best achieved with designing, validating and sustaining effective moocs as required by 21st century learners. Any similar catastrophic situation like covid19 in near future may again disrupt the education sector, if within time, sincere and concrete steps are not adopted in developing India's online education based upon global quality, market relevance, and learners suitability.

References

- Adhikari, Lokesh & Semalty, Mona & Semalty, Ajay. (2021). *A critical study of SWAYAM MOOCs: Increasing reach and expansion*, *University News* (0566-2257).59.9-18. Retrieved from <file:///C:/Users/dsgvd/Downloads/UNswayampaper2021.pdf>.
- Agustini, K.,Santayasa, IW., Ratminingsih, NM.(2019), Analysis of Competence on “ TPACK”; 21st century Teacher Professional Development. *Journal of Physics Conference Series* 1387 (1):012035. <http://dx.doi.org/10.1088/1742-6596/1387/1/012035>
- Bordoloi, R., Das, P., Das, K.(2020). Life long learning opportunities through MOOCs in India. *Asian Association of Open Universities Journal*. <http://dx.doi.org/10.1108/AAOUJ-09-2019-0042>
- Goswami, M. P., Thanvi, J., & Padhi, S. R. (2021). Impact of Online Learning in India: A Survey of University Students During the COVID-19 Crisis. *Asian Journal for Public Opinion Research*, 9(4), 331–351. <https://doi.org/10.15206/ajpor.2021.9.4.331>
- Harris, J.B., Mishra, P.,& Koehler, M.J., (2007). Teacher’s technological pedagogical content knowledge: curriculum –based technology integration reframed, *Paper presented in 2007 at Annual meeting of American Educational research association*, Chicago-II. <http://dx.doi.org/10.1080/15391523.2009.10782536>
- Joshi, A.Vinay, M., Bhaskar,P.(2020). Impact of Coronavirus pandemic on the Indian education sector: Perspectives of teachers on online teaching and assessments. *Interactive Technology and Smart Education*, Volume 18, No. 2, pp. 205-226. <https://doi.org/10.1108/ITSE-06-2020-0087>
- Kantipudi. MVV, Moses. J, Aluvalu.R, Golyalla.T (2021). *Library Philosophy and Practice* (e- journal), 19/1/2021, Libraries at University of Nebraska- Lincoln. Retrieved from <https://digitalcommons.unl.edu/libphilprac/index.2.html>
- Kurien, A. Chandramana, S. (2020), Impact of New Education Policy 2020 on Higher Education, *Conference: Atma Nirbhar Bharat: A Roadmap to Self reliant India*, at Thiruvalla, November 2020, DOI: [10.6084/m9.figshare.13332413.v1](https://doi.org/10.6084/m9.figshare.13332413.v1)
- Lamrabat, A. (2020). Protecting and mobilizing youth in COVID-19 responses | United Nations for Youth. *United Nations Youth*. <https://www.un.org/development/desa/youth/news/2020/05/covid-19/>
- Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). E-learning, online learning, and distance learning environments: Are they the same? *Internet Higher Educ*, 14(2), 129–135. Retrieved from <https://link.springer.com/article/10.1007/s10639-021-10523-1#Abs1>
- Nadikattu, R. R. (2020). Information technologies: Rebooting the world activities during COVID-19. *SSRN Electronic Journal*, 1–10. <https://doi.org/10.2139/ssrn.3622733>
- National Policy on Education (2020). Ministry of Education, New Delhi, India. Retrieved from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Nayak, S. (2019). Massive Open Online Courses (MOOC) in India: Higher Education towards Sustainable Digital Revolution, conference: *national seminar Volume entitled Redefining Higher Education: Techniques, Thought and Impact*, Saligram At At: 978-81-939820-6-8. Retrieved on January 4, 2022 from https://www.researchgate.net/publication/354858967_Massive_Open_Online_Courses_MOOC_in_India_Higher_Education_towards_Sustainable_Digital_Revolution_Savita_N_Nayak
- Panditrao MM, Panditrao MM (2020). National Education Policy 2020: What is in it for a student, a parent, a teacher, or us, as a Higher Education Institution/University? *Adesh University Journal of Medical Science & Research*;2(2):70-9. doi:10.25259/AUJMSR_32_2020
- Pnat,H.V., Lohani,M.C.& Pande, J. (2021) MOOCs in Higher education: Current Trends in India and developed countries. <https://orcid.org/0000-0002-3017-164X>
- Prensky, M. (2005). Listen to the Natives. *Educational Leadership*. 63(4),8-13
- Rodriguez, C.O., (2012). MOOCs and the AI- Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. Universidad del CEMA, Av. Córdoba 374, (C1054AAP) Ciudad de Buenos Aires, Argentina [<http://www.ucema.edu.ar>]
- Rolfre,V. (2015). A systematic review of the socio- ethical aspects of massive open online courses. *European Journal of Open, Distance, and E- learning*, 18(1), 53-72. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1065118.pdf>
- Sandeem, C. (2013). Integrating MOOCs into Traditional Higher Education: The Emerging “ MOOC 3.0” Era. Change: *The magazine of Higher Learning*, Volume 45, No. 6, p.p 34-39, <https://doi.org/10.1080/00091383.2013.842103>
- Sathishkumar, V. & .Radha, Dr & .Saravanakumar, Dr & Mahalakshmi, K.. (2020). E-Learning during Lockdown of Covid-19 Pandemic: A Global Perspective. *International Journal of Control and Automation*. 13. 1088-1099.
- Sharma, A., (2021),ICT India Working Paper # 42, Education through ICT Initiatives during the pandemic in India, CSD Working paper series: Towards a New Indian Model of Information and Communication

- Technology- Led Growth and Development. Center for Sustainable Development, Earth Institute Columbia University. Retrieved on January 5, 2022 from https://csd.columbia.edu/sites/default/files/content/docs/ICT%20India/Papers/ICT_India_Working_Paper_42.pdf
- Tari,S. and Amonkar, G. (2021). Impact of Covid on Higher Education in India, *Educational Resurgence Journal* Volume 2, Issue 5, January 2021, ISSN 2581-9100. Retrieved on January5, 2023 from <https://coed.dypvp.edu.in/educational-resurgence-journal/documents/jan-2021/22-27.pdf>
- Trehan, S., Sanzgiri, J., Li, C., Wang, R., Joshi, R.M, (2017). Critical discussion on Massive Open Online Course (MOOCs) in India and China, *International Journal of Education and Development using Information and Communication Technology* (IJEDICT), 2017, Vol 13, Issue 2, pp.141-165. Retrieved on January 5,2022 from <https://files.eric.ed.gov/fulltext/EJ1153318.pdf>.
- UNESCO. (2020, June 15). *Education: From disruption to recovery*. <https://en.unesco.org/covid19/educationresponse>
- UNICEF. (2021, March 10). *COVID-19: Schools for more than 168 million children globally have been completely closed for almost a full year, says UNICEF*. <https://www.unicef.org/india/press-releases/covid-19-schools-more-168-million-children-globally-have-been-completely-closed>
- Wolfinger, S. (2016). An exploratory case study of middle school student academic achievement in a fully online virtual school (Doctoral dissertation, Drexel University). Drexel University.