DIGITAL TRANSFORMATION IN HIGHER EDUCATION DURING COVID-19 PANDEMIC: SOCIO - ECONOMIC DIMENSIONS

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ABSTRACT

The lockdown implemented as a measure to contain the spread of the pandemic Covid-19 lead to the closing down of educational institutions worldwide. However, digital technologies came to the rescue of hundreds of students who would have otherwise lost an academic year. Online classrooms and virtual labs ensured the continuation of the educational process in an online mode. The present study investigates how the higher education sector adopted digital technologies during the COVID-19 lockdown period. The present paper examines the socio-economic dimensions of the digital transformation in higher education during the Covid-19 pandemic. Using secondary data sources such as newspaper articles, periodicals, peer-reviewed journals, websites, and policy reports from national and international organisations, the paper examines how the digital transformation affected students of non-professional colleges. The paper concludes that the digital divide and the existing economic and gender inequalities have been challenges for the smooth transformation of higher education from a physical to a virtual mode. Finally, the paper suggests that any policy adaptation should consider the social and economic dimensions, even if it is a purely technical one, in a developing country like India.

Keywords: *digital technologies, gender divide, inequality, digital divide, accessing technology.*

1. INTRODUCTION

The COVID-19 epidemic prompted the lockdown of almost all the economies, which helped limit the virus spread and save lives, but created the worst economic downturn since the Great Depression of the 1930s[1]. This is a crisis unlike any other, and the consequences for people's lives and livelihoods are unknown. Moreover, a lot is dependent on the virus's epidemiology, the efficacy of containment measures, and the development of treatments and vaccinations, all of which are difficult to anticipate [2]. In addition, as a result of the lockdown, many countries are facing numerous crises, including a health crisis, a financial crisis, and a drop in commodity prices, all of which are intertwined in complex ways. Both developed and developing economies are in recession for the first time since the Great Depression. The Covid-19 pandemic and the lockdown have drastically altered our lives and presenting existential and educational questions—[3].

The coronavirus outbreak had a high impact on education, putting academics and students under much stress. Educators fought to shift to a virtual classroom setting in the face of much uncertainty and frequently changing information, developing ways to engage with students online and ensuring they had access to the resources they require to finish their education.

The transition to online education has ensured that students do not miss any classes and that their progress is monitored and evaluated regularly. It is likely a first for India to experiment with education and make a paradigm shift to the virtual world, combining classrooms with online learning. Students will learn more creatively by combining education and technology and establishing a collaborative plan to move forward while offering online lectures. Universities encourage students to learn by choice rather than by their actual presence in a classroom by deploying innovative technologies to improve syllabus memory. Furthermore, colleges that provide AI-enabled learning as part of their different courses and other collaborations are only helping the country imagine a new tomorrow based on educational reforms.

The present study examines how the higher education sector adopted tools of digital technologies during the COVID-19 lockdown period. It tries to understand the factors that played a crucial role in the digital transformation of higher education. Using secondary data sources such as newspaper articles, periodicals, peer-reviewed journals,

websites, and policy reports from national and international organisations, the paper examines the socio-economic dimensions of digital transformation of higher education and how this transformation affected students and faculty of non-professional colleges.

2. DIGITAL TRANSFORMATION OF HIGHER EDUCATION

The introduction of the lockdown resulted in the emergence of virtual learning, the usage of zero-rated apps and instructional websites, the establishment of digital classrooms, and the conversion of the higher education sector to remote learning[4]. The online classes introduced as a solution to lockdown is referred to as emergency remote learning (ERL), which refers to urgent and sudden efforts to move face-to-face learning and course materials to remote learning[5].

The shift to digital classes had many challenges to overcome. These constraints were multiple and had to be tackled at different levels using different strategies. Technology, culture, practises, people's skills and competencies, as well as their values, attitudes, identities, and mindsets, have all been identified as hurdles to digital transformation [6]. The constraints were there on the government mechanism, educational institutions, administrators, universities, faculty members and most importantly, students. The solutions, however, came swiftly from various ends.

The Government of India introduced multiple arrays of digital technologies to cater to the needs of the academic community. For instance, under the *Atmanirbhar Bharat* for education, the Government of India introduced schemes like PM e-VIDYA, e-PG Pathshala, National Foundational Literacy and Numeracy Mission, and Manodarpan, apart from strengthening the online learning portal 'Study Webs of Active-Learning for Young Aspiring Minds' or SWAYAM [7]. Various educational institutions organised several training programmes under the auspices of 'Pandit Madan Mohan Malviya National Mission on Teachers and Teaching' in a wide array of topics to enrich the digital learning environment. These training programmes covered topics like ICT tools for effective teaching, ICT based learning, digital pedagogy, developing MOOC, managing online classes, e-learning, software tools for digital classes, open-book examinations, online evaluation techniques, flipped classrooms, machine learning, e-content development, open-source software for research and teaching, blended learning and Academic Bank of Credits (ABC) Scheme in Higher Education. These courses imparted the much-required training for faculty members who were willing to transform to the digital era. There was some more ambitious response by the Governments to ensure uninterrupted learning; for instance, the Government of Kerala initiated two universities Kerala University of Digital Sciences, Innovation and Technology and Sreenarayanaguru Open University.

The responses of the educational institutions were diverse basically due to the lack of expertise in digital technologies and constraint of financial resources. Some educational institutions spontaneously reacted by enhancing digital infrastructure, subscribing to digital platforms, adapting LMS, setting up recording and editing facilities etc. Extensive training programmes in digital technologies were launched for faculty, administrative staff and even students by many educational institutions. However, the lack of digital pedagogy and a uniform policy was a constraint since many institutions tried to replicate physical classes in a digital platform. The virtual classes of many institutions were just a webcast of a physical classroom, making the process stressful to the learners who did not have sufficient infrastructure. Many faculty members were reluctant to get themselves trained in the new technology and virtual environment. The attitude of faculty in integrating digital technology with their classes are determined partially by the professional development training they received and partially by their attitudes. Hence it is extremely essential that those who frame policies should have a cavernous understanding of the attitude of faculty toward the use of technology in the teaching-learning process by systematically analysing the contexts in which faculty engage technology.

The university system reacted to the situation by bringing in changes at multiple levels. The universities primarily restructured the examination system; while some made it, online others made alterations in the examination pattern and question paper structure. Many universities even experimented with open book examinations. IIT Goa even went to the extend of asking students to prepare their own question paper based on lecture material and then answer it.

Several world-renowned publishers –""–[8] offered free access to content in their collections, ensuring that students and researchers have access to materials in a variety of fields as education institutions transitioned to an online learning environment [9], [10]. Cambridge University Press offered more than 700 digital textbooks for free, while Cengage provided free of cost access for its e-books and digital platforms during the academic year starting in 2020 [11]. Springer Nature's 500 essential textbooks across eBook collection were made free to download and thousands of research articles on the coronavirus free to read '[12].

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Various digital technologies have contributed to the transformation of higher education to online mode. For example, artificial intelligence and robotics; ubiquitous linked sensors; virtual and augmented realities; additive manufacturing; blockchain and distributed ledger technology; advanced materials and nanomaterials; energy capture, storage, and transmission; and new computing, biotechnology, geoengineering, neurotechnology, and space technologies are among these technologies[13]. OUP supported educators by offering free online access to its Online Teacher Training modules and webinars, including lesson plans, printable worksheets, animations, PowerPoint slides, solution manuals, and critical thinking activities[14]. OUP also relaxed some key higher education copyright terms to give academics, libraries, and students increased access to learning resources during the lockdown[15].

In selecting the online platform, the prime concern was cost-effectiveness. Many online platforms such as Zoom, Google Meet and Cisco Webex provided a free account to educational institutions and educators[16]. The use of these platforms was constructive in the teaching and learning process during the lockdown, making remote learning almost an alternative to the traditional model[17].

The most significant challenge in the virtualisation of education was at the students' end. A significant constraint faced by the students is the accessibility of devices and infrastructural facilities. “More than 60% of the students are not ready (due to lack of technical, infrastructural, and high-speed internet access, and power supply, limited network data per day) for the online classes”[18]. Several studies show that poor internet connectivity, lack of sufficient bandwidth, insufficiency of data packs, and electricity failures caused constraints for effective learning even in semi-urban areas[19]. Another impediment in the smooth transition to the digital environment was a lack of expertise in digital technologies on both the faculty and students. Intensive professional development for faculty and training in digital technologies for students continued at most institutions throughout the academic year 2020-21 [20]. However, the lack of an explicit digital pedagogy was a constraint. While a large percentage of the academic community in higher education found virtual learning exciting, a small percentage found it stressful [21]. The cognitive capacities and capabilities of students are different. As a result, while some can better understand visuals, it will be textual for some others. Again, many are not comfortable reading on the screen. However, these cognitive diversities were not considered by higher educational institutions while formulating their online teaching programmes.

The digital divide and the gender digital divide existing in Indian society must be taken seriously in this context. These two factors are capable of not only nullifying the benefits of digital technology but can reinforce the barriers—[22]. The shift to online learning highlighted India's glaring digital divide, with many students finding it difficult to attend virtual classes due to poor internet connectivity in rural areas. From a gender perspective, there are certain areas where female students faced more problem than male students. For instance, 'slow internet connection', 'insufficient data subscription', 'lack of availability of the device (using a device of parents)', 'shared device (with siblings)', 'outdated device', 'technical difficulty, and 'non-technical issues (financial problems)' were reported more severely by female students than male students. These are evident enough to indicate gender disparities in the online educational scenario[23]. It is alarming to note that there were several instances where female students were not provided with the same facilities as male students at the household level, thus challenging the gender neutrality of digital technologies. [24].

UNESCO[25] rightly observes that “the educational response to the COVID-19 crisis has revealed the capacity of educators to draw on their professional knowledge and collaboratively mobilise with resourcefulness and creativity that could not have been achieved by a public authority simply issuing top-down orders. In fact, over the last several months, the education sector, which is often unfairly critiqued for its conservatism, has shown itself to be among the most robust and adaptable of all social institutions. This is an important lesson from this crisis and should grant teachers greater autonomy and freedom. Teachers need to be more recognised and more highly valued; they are essential participants in defining the futures of education. Today it is clear that nothing can substitute for collaboration between teachers, whose function is not to apply ready-made technologies or pre-prepared didactics but to assume their role as knowledge enablers and pedagogic guides fully. The capacity to initiate, experiment, and innovate unleashed during these pandemic disruptions must be allowed to continue. Teacher collaboration should also be understood as expanding to include engagement with a wide set of educational stakeholders, particularly because in this crisis those education systems most engaged with families and communities have shown the most resilience.”

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3. CONCLUSION

The COVID-19 and the resultant lockdown have influenced educational delivery, including classroom experiences, communication, and evaluation systems. Experiments and case studies worldwide reveal that online education works best when it is organised as a system of interconnected, complex components adapted to the student's needs. As a result, all stakeholders in higher education worked to guarantee that students continue to receive a high-quality education, whether in real or virtual classrooms.

The introduction and integration of digital technology into the teaching-learning process had several barriers; infrastructural, pedagogical, technological, structural, sociological, economic and psychological; for both educators and students. Hence, like any attempt to introduce change, introducing digital pedagogy should be initiated by bottom-up initiatives rather than top-down efforts. This certainly requires more than measuring the digital skills of the faculty and students but understanding the structural problems of the environment.

The most crucial consideration in the adaptation of digital technologies was the cost involved. Since it was an unanticipated investment, the higher educational institutions in the non-professional segment could not find the resources for the same. The governments that generally assist in such crises could not do much as they were in a resource crunch due to loss of tax revenue. However, global tech giants also lent a timely helping hand by making their online platforms accessible without cost for educational purposes.

The disruptive influence of Covid-19, combined with the availability of digital technology that can support online learning, presents a once-in-a-lifetime potential for the global transformation of higher education[26]. The situation emerging from the lockdown is an opportunity as well. India's EdTech business, the second largest in the world and its universities, can play a crucial role in producing flexible, innovative, and resilient educational solutions –[27].

Though highly technical, the introduction of any policy should also consider the social implications in a society like India. Scientific solutions to human problems may not have much application in a society that is still predominantly rural. The pandemic has demonstrated the importance of moving away from a purely instrumental approach, for instance, how to utilise technology as a tool, and toward policies that foster a more profound change that considers the social realities. Presently, UGC is introducing a blended model of teaching and learning, an instructional approach that combines face-to-face classroom methods with computer-mediated activities to deliver instruction[28]. In formulating such policies, caution should be exercised to ensure that the inherent gender and digital divide prevalent in Indian society does not exclude certain sections of the population from enjoying its benefit. Technology is just a tool, and only if it has appropriate integration with the socio-economic environment, it will result in creating benefits to society. Whether physical or virtual, higher education should be accessible to the masses and should be inclusive.

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