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The Sustainability of Online Education in the Indian Context: A SWOT Analysis

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Abstract

The aim of this paper is to analyse the feasibility of online learning in the current Indian education system through SWOT analysis. As a measure of safety to the COVID-19 pandemic, all education centres such as schools, universities were shut down nationwide and the conventional mode of teaching, as well as learning, came to cease. Owing to the need of the hour, online education came into force and became widespread with increasing audio visual technologies. While online learning engulfed and intrigued the nation, a high percentage of students also faced a varied range of physical and mental pressures as a result of it. The authors also incorporate the rise of ed-tech startups and the enhancement of video conferencing platforms which have aided in the development of online education. Further, the paper explores the lack of facilities such as network, internet connection and laptops across the country. Through the lens of gender, caste and class, the authors explore the digital divide that has emerged as a result of online education. Although many students were able to adjust, yet in contrast, a significant section of the population found it increasingly difficult to keep up with the complexities of this model. Hence, this paper aims towards documenting the qualitative aspects of the impact of online learning in the education system.

Keywords: *online education, COVID-19, pandemic, ed tech, inaccessibility, regression in learning, digital divide*

1.0 Introduction

The unprecedented emergency of COVID-19 disrupted the entire world, including the education sector. With sudden widespread isolation, social distancing and lockdown, it became almost impossible for educators and students to stand under one roof to gain and part knowledge. Physical learning ceased and online learning came into force almost overnight to fulfil today's educational trend.

Online education dates back to 1994 in India and due to the confluence of technologies it has been growing steadily through various modes. It cannot be denied that the pandemic and the nationwide lockdown put online education on the fast track. It induced the largest remote learning experience in history. Moreover, the comparison between online and offline education specifically in terms of their sustainability and effectiveness in the long run is still a discussion of

interest between educators and students. However, with the growing trend and emerging Information and Communication Technology (ICT) facilities, more and more universities are broadening their horizon by introducing new and dynamic courses and widely spreading it because of the flexibility this online mode provides. The disruption of the formal school system brings with it major changes that could have a significant impact on India's future generations as well. Excess of screen time, social isolation, nil classroom engagement with dynamic interactions and lack of physical presence is undoubtedly hampering students' physical and mental health, performance, satisfaction and learning. Moreover, the lack of equitable digital infrastructure in India and its implications on caste, class, disabled population and gender acts as a major point of contention. The question of how impactful the online courses are for both practical and theoretical subjects remains unanswered.

The main research question of this paper is to evaluate the level of sustainability and feasibility of the online education system in the long run in India. By employing a secondary research foundation, we aim to analyse the various facets of this method of education. Through our findings, we provide certain recommendations which seek to remedy the persistent problems that accompany this mode of education.

Our research methodology is through SWOT analysis (strengths, weaknesses, opportunities and threats). It is a technique of assessing all the above-mentioned four aspects of a particular topic, business or subject of relevance. It is imperative to establish our understanding of certain terminologies that will be used throughout the paper. MOOC refers to Massive Open Online Courses which are designed to provide education online where students learn about a particular topic and can assess themselves on the same. MOOCs are spread worldwide and are a great source of learning. E-learning is defined as the self-paced or real-time delivery of training and education over the internet to an end-user device. (Lee & Lee, 2006). This learning method is based on formalized teaching but with online resources. Lastly, education technology commonly known as Ed-Tech or refers to the combination of hardware and software designed to enhance teacher-led learning and improve students' outcomes in the online method. Ed Tech startups such as Khan Academy, Edx and Byjus have succeeded in bringing a revolutionary change in how education is disseminated throughout the world.

2.0. Literature Review

Before delving into our study, it is important to review the literature that has been composed concerning the state of online education in India.

In “Students’ Perception and Preference for Online Education in India during COVID -19 Pandemic”, Muthuprasad et. al. evaluate students’ perception and preference for online education through an online survey. The paper’s central argument lies in its exploration of the factors that will help in designing an effective online environment. By incorporating students’ experiences on a primary level, the study manages to create an effective portrayal of the online education experience through the lens of those affected. Beginning with a proper background of the emergence of online education in the wake of the pandemic, the authors suggest that learning quality in these novel circumstances depends significantly on the level of digital access and efficiency (Muthuprasad et al., 2021). The participants constituted over 300 agricultural students from the National Agricultural Research System (NARS). The research methodology applied was a structured and unstructured preliminary questionnaire along with informal discussions with the students. Data analysis such as the Garret ranking technique, wherein respondents ranked their preferences and further, the percent position of each rank was converted into scores using the table given by Garrett and Woodworth (1969), was also employed for determining the benefits and constraints of online learning. To remedy research gaps that might arise due to the nature of open-ended questions, content analysis was also done. The results indicated that the majority of the participants preferred recorded lectures and live classes rather than reading material. According to the students, some of the benefits of online learning were the flexibility in schedule, chance to enhance technical skills and self-discipline while the bottlenecks were identified as lack of connectivity, no face-to-face interaction and intense requirement for self-discipline. Here, a research gap also comes to light. Self-discipline was listed as a benefit (average score = 45.81) and also as a bottleneck (51.17) albeit in slightly different contexts. Further investigation needs to be considered in order to understand why some students ranked the chance to become more self-disciplined as a strength while some identified it as a weakness. Nevertheless, the research conducted by Muthuprasad et. al has emerged as one of the most comprehensive studies on the lived experiences of students during the pandemic.

“Regression in Learning: The High Cost of COVID-19 for India’s Children”, a report issued by Observer Research Foundation, one of the most prominent think tanks in India adds an incredibly important layer of accessibility to the discourse of online education. The authors argue that the switch to online education has established a “regression in learning”. By particularly looking through the lens of gender, caste and class, the paper attempts to establish the learning gaps that have emerged as a result of pandemic-induced virtual learning. The significance and relevance of the research is emphasised repeatedly throughout their paper by the usage of phrases like “children were the first victims of the COVID-19 pandemic”. The authors question the logic behind the opening of shops, restaurants, bars, and malls during the waning phases of the pandemic and not schools. However, this line of reasoning might be slightly optimistic since it is naturally much easier to manage and control social distancing guidelines among adults than among young children at schools. The paper further explores the determinants of access to online education and its implications in the context of an incredibly diverse and unequal India. Statistics of spatial and social divide are included, comparing the availability of electricity across states, percentage of households with internet facilities, smartphone ownership among other impact parameters. One of the most unique aspects of this study is its evaluation of the phenomenon of “learning loss” for language and mathematical abilities that have emerged during online education. The authors concluded their study with a plea to reopen schools and henceforth, they also recommended the regulations and infrastructure necessary for a smooth switch back to offline education (Observer Research Foundation, 2021).

3.0. SWOT Table

In order to examine the feasibility of online education, we have attempted to formulate a comprehensive SWOT table by collating and analysing qualitative secondary research (Muthuprasad et al., 2021; Observer Research Foundation, 2021; Dhawan, 2020).

<u>Strengths +5</u>	<u>Weaknesses -7</u>
1. Enhancement of video conferencing platforms like Zoom, Google meet, Microsoft teams, etc	1. The strain on Mental and Physical Health. 2. Lack of Social Interaction

<ol style="list-style-type: none"> 3. Rise of Ed-tech startups and MOOCs 4. More Time & Cost-Effective 5. Flexible Schedule and Convenience. 6. Facilitates Increased Participation from Under Confident Students 	<ol style="list-style-type: none"> 7. Dire lack of network connection and electronic facilities 8. Gendered Inaccessibility 9. Socio-Economic Inaccessibility: Effect on Caste and Class 10. Inaccessibility arising due to Disabilities 11. Less Transparency during conduction of examinations
<p><u>Opportunities +3</u></p>	<p><u>Threats -3</u></p>
<ol style="list-style-type: none"> 1. Promotion of skills 2. Opportunity to maintain work-life balance 3. Provides an Environment-Friendly Approach to Teaching 	<ol style="list-style-type: none"> 1. Profound Change in Evolutionary and Study Pattern due to reliability on online devices. 2. A rise in cyberbullying and cyber crimes 3. Regression in Learning: the phenomenon of “Learning Loss”

4.0. Strengths

4.1. Enhancement of Video Conferencing Platforms (A Study of Zoom, Google Meet, Microsoft Teams)

The use of video conferencing became a reliable source for imparting online education through various platforms like Zoom, Microsoft Teams, Google Meet, Cisco Webex, Skype and many more which witnessed exponential growth and a huge rise in downloads post-pandemic as many people were working remotely. Not just the education sector but the private industrialized sector were also able to move forward with the help of such platforms. The pandemic accelerated the rise of these platforms to an unrivalled scale. According to a report, it was observed that there were 62 million downloads for these video conferencing platforms in just a month of March 2020 (Singh & Awasthi, 2020).

4.1.1 Zoom

Nowadays, Zoom is one of the most popularly used platforms to conduct online classes in various educational institutions and for conducting meetings in offices. Zoom has over 200 million users per day. Although initially the site was plagued with various security and privacy issues, it kept resurging with regular updates and is now one of the widely used platforms today. From adding custom background to screen recording, screen sharing, team chats, searchable history, Zoom provides countless features. Over 100 people can be accommodated with 49 video screens for free and the meeting size can even go up to 500 to 1000 people with the license. Zoom has been one of the most popular platforms due to its way of ensuring the safest online call by:

- Protecting the meetings with the passwords so that the unwanted attendees cannot enter the call with just the link.
- Locking up of meetings, where you can lock the call once all the required members are in the meeting which is very beneficial for the confidential or restricted content.
- Switching off participant screen sharing helps in switching the screens in case unauthorised content pops up.

Nevertheless, the Zoom platform has always been surrounded by a storm of security issues, and the government even cautioned people and the computer emergency response team. Even after releasing a two page long advisory concerning security purposes, with continuous updates, Zoom has emerged as one of the favourable platforms to be used (Singh & Awasthi, 2020).

4.1.2 Microsoft Teams

Microsoft Teams is one of the strongest companions in the market of video conferencing platforms. Microsoft has claimed that video conferencing on Teams, which competes with other platforms, were up 1000% in the month of March 2020. It always witnesses a new feature or addition when it observes a hike in the user activity and makes accommodations according to the user behaviour. They observed around 900 million daily users, which rose to 2.7 billion around March 2020. Moreover, Microsoft even drew attention towards them when they claimed that over 1,83,000 educational institutions which included many schools and other private coaching centres started using Teams for classes.

It is built on Office 365 - enterprise, delivering the user advanced security. It enforces organization-wide and team-wide two-factor authentication with the encryption of data at the transit. All the notes that are made during class and meetings are stored in the One Note app backed by the OneNote encryption. Microsoft also provides advanced threat protection to their users which determines if the content in the apps associated with the teams for content management is malicious or not and blocks the user at the spot. The safe attachments feature of Teams is able to detect malicious or unwanted attachments and enhances the user security check. (Singh & Awasthi, 2020)

4.1.3 Google Meet

Along with all other video conferencing platforms, Google Meet is also one of the platforms that captivated the attention of the users. It allows screen sharing and even provides the users to share their entire screen or just a tab from their window. People from schools, businesses and from all over the world are now depending on the G Suite to stay connected throughout and get the work done. Google Meet is a product of Google which aims at secure end to end connection for the users from unwanted and thwarting attacks, where the security features are turned on by default in the app. Google Meet limits the ability for external users to join the meeting 15 minutes prior by freezing the screen where no brute force attack can be attempted. They keep control over users' data for protection and use the same traditional method that the rest of the Google enterprise services uses. Customers own their data and Google doesn't use their customer's data to sell it to third parties. For security measures, Google follows certain encryption measures:

- The data between Google and the user is encrypted at the transit and the rest for the video meetings by default on the android system and the IOS system.
- Google meetings are stored in Google Drive which is again encrypted by default.

Here, it is worth noting that someone joining the Google Meet video from their phone will use the audio from their telephone carrier's telephone which might not be encrypted (Singh & Awasthi, 2020).

4.2. Rise of Ed Tech startups

COVID-19 showed us tremendous changes in our day to day lifestyle, from moving out on roads to staying locked down in our houses, from working on the field to sitting in front of the screens and whatnot. Life changed drastically and so did the methods of living. A huge rise in ed-tech startups was seen over the pandemic which turned out to be highly promising in such crucial times. Digital education originated in the University of Illinois in the 1960s, and the journey of online education in India began with the launch of Educomp in 1994. (Sarkar, 2020). Since then online education has been prevailing in India, with Byjus being one of the most valued startups in 2021 (ET, 2021). Over time, today the market is hoarded with tons of Ed-Tech startups where the never-ending list includes Vedantu, Pesto, GlobalGyan, ExtraaEdge, Khan Academy, e-pathshala, Jungroo learning, etc. All the Ed-Tech startups are working hard to provide the best possible facilities to the students by providing access to numerous free courses or by charging minimal fees. Various platforms like edX, Udemy, etc have launched their scholarship programs to encourage students to pursue higher education or by providing access to all the courses for free for a lifetime as perks.

Massive Open Online Courses (MOOCs) saw a huge surge over the pandemic around 12% of the total population in India enrolled in the Udemy and Coursera courses with 55% males and 45% females. Students were intrigued and perhaps even motivated to receive the certificate at the end of the course which would help them in their job areas further due to which we saw a huge surge in the enrollment in multiple courses. (Impey & Formanek, 2021)

4.3. More Time & Cost-Effective

One of the biggest strengths of online education has been the absolute reduction in the time and money invested in transportation. Students used to travel all across the city to reach their institutions. Data collated across Bengaluru, Hyderabad, Chennai, Pune, Mumbai and Delhi-NCR revealed that on average, Indians spent 7% of their day commuting (ET Bureau, 2019.) Therefore, the shift from commuting daily to presently being able to access classes from the comfort of your home has considerably made the lives of students much easier and economical. In fact, in a recent survey, students perceived this aspect as the strongest advantage of online education, with the highest mean value of 2.84 among all wherein the range was

between 1-3 (Gupta, 2020). Additionally, study material can now mostly be accessed via e-books instead of splurging on numerous physical books. This, too, will majorly impact the average student's budget.

4.4. Flexibility and Convenience

One of the most appealing factors of online education is the flexible schedule that it offers. This idea of being able to access our classes from "anytime and anywhere" played a major role in the students' experiences in the initial months of the pandemic. Moreover, certain elements of online learning such as recorded lectures, Youtube videos and online quizzes, can truly be accessed according to one's time and convenience, therefore, enabling students to set their own learning pace. In fact, Muthuprasad's study has corroborated that a flexible schedule and convenience was ranked as the top-ranked advantage of online learning. A Bangalore college student stated, "The online option is a need in this pandemic situation. It has brought education to us without us going anywhere, and it is more flexible" It also allows students to have a better balance of academics, work and leisure. The shift from an offline method of education which consisted of strictly attending 9-5 classes to the online platform can be considered a "gamechanger" (The Hindu, 2021).

4.5. Facilitates Increased Participation from Under Confident Students

The online platform provides, with it, various means of engaging with the professor and peers. One of the strengths of online education is the increased participation of students who are generally underconfident, shy or socially anxious. These students have the option of switching their video off, asking their doubts through the chat box and even have the option of clicking non-verbal feedback controls such as 'raise hand option', 'Yes', 'No', 'Slow down, and 'Speed up'. Since it is not face-to-face interaction, it encourages students to freely discuss queries with their professors (Azam, 2020). Texting or sending emails to a professor has also emerged as a norm in the past year, resulting in students who are intrinsically shy having a formal, yet more relaxed equation with their teachers. However, we must also note that this aspect must not be considered as absolute. It is important to not treat students as one homogenous population. While for a section, it has facilitated participation, for others it might act as a deterrent. The alternative

side would involve a decrease in motivation and confidence due to the absence of face-to-face contact and non-verbal cues. In this context, our research attempts to address this complex problem.

5.0. Weaknesses

5.1 Effects on Physical & Mental Health

Closing down university campuses and schools affected the mental and physical health of students at a vast level. Students faced a wide range of logistic and social problems. Postponement/cancellation of examinations, summer internships, placements, students were looking post their examinations increased the stress level amongst the students. Studies showed that many students reported depression, high and moderate anxiety, distress and even suicidal thoughts. Lack of motivation and negative thoughts have made it difficult for the students to focus, they are just not worried in general but from the aspect of their careers too. The current online situation has a modest but persistent effect on the mental level of students.

According to a study, 67.9% of students felt that their day to day life is getting affected due to online education and 63.6% of the students felt that online education is exposing them to the digital divide. 54.2% of the students also stated that online assessment causes more anxiety than the traditional form of assessment. Not only mentally, but students were also physically affected too due to almost overnight shifting of the offline education form to the online methods. The National Institute of Mental Health and Neurosciences stated that increasing dependency on digital devices has its side effects like a strain on the eyes, headache and computer vision syndrome due to which students tend to lose their interest in online learning consecutively which in result becomes very challenging for the students to stay engaged collectively where student engagement is one of the important aspects for better understanding of the concepts and makes teaching effective. 74.6% of the students claimed that excessive screen time is causing stress and affecting their sleep. (Chakraborty et al., 2020)

5.2 Lack of Network/Internet & Electronic Device Accessibility

Poor internet connectivity and lack of the various audio visual devices shadowed online classes. Students residing in remote areas had to trek kilometres just to travel to a place for good

internet connectivity to attend classes or to submit their assignments online.

According to a survey done in the remote area of the Bangaan region of Uttarkashi district, it was found out that students have to walk for around 10 to 12 kilometres in order to attain network connection from their neighbouring state Himachal Pradesh so that they could attend classes (Roy, 2020)

“Our village is one of the places where basic communication facilities are missing and villagers have to walk towards the forests at the time where they get a signal that it rains when we are outside and we are not able to study. Students are the ones who are suffering the most who have to travel 3-4 kms at times during the lockdown to attend online classes,” said Anish, a ten-year-old student from Silla village who shared a video to voice his concerns. (Roy, 2020). AK Jukariya, the Chief Education Officer of Pithoragarh, said, *“We started online classes for all 214 secondary and higher secondary schools in the district but only half of the schools could pick it up due to lack of network connectivity.”*

Not only poor connectivity but the unavailability of electronic devices is also one of the greatest hurdles in online learning. As per the National Council of Educational Research and Training (NCERT) survey for government schools, around 27% of the students do not have access to smartphones, laptops or any other electronic devices to attend online classes, on the other hand, 28% of students and parents believe that lack of electricity is one of the major hindrances in attending the classes (Nagari, 2020). Moreover, another survey conducted by Brainly for about 2000 students, claimed that only over a third of students in India can say that their schools have extended education through online mode. The survey also shows that nearly 60% of students did not attend school posts and only 36% of the students were learning via online mode, while a few students were just happy sitting idle at their homes (Awasthi, 2021).

5.3 Lack of Social Interaction

Due to the sudden lockdown amidst the pandemic, all the educational institutions and schools suspended the classes for all the students ranging from kindergarten to higher studies like postgraduate, PhD, etc. Physical interaction was prohibited by all means as the learning jumped to online mode which resulted in a lack of social interaction amongst students. Physical

proximity and interactions are important for developing and fostering social ties between students and teachers. As face to face interactions and encounters between the educators and the students were almost nil, it impacted the retention power and understanding of concepts among the students. Five major social changes which were noticed in the students were worked upon in a survey by Elmer et al. (2020) namely, pleasant interactions, friendships, emotional support, informational support and co-studying

In pleasant interactions and co-study networks, it was discovered that students' nominations were fewer as compared to earlier as they are lacking peer to peer conversations and discussions. The friendship networks were more or less similar as most of the kids were connected to one another through various social media platforms, whereas for informational and emotional support networks the nomination by students were slightly increased as kids were somewhere comforted at home by their relationships with their loved ones. The study also proclaims that there were students who did not even name a single contact for each of the networks, that is the children who remained isolated and did not maintain social relations (out-isolates). The analysis also showed that the nominations for study networks were significantly higher. Hence all these nominations and network comparisons find that the functional and social network between students has considerably decreased.

5.4 Gender Differentiations in Online Learning

On the face of it, the digital domain seems to provide a space with lessened hierarchies and easy exchange of information. Yet, disparities across gender, caste, class and disabilities do manifest significantly. These inequalities play a profound role in the traditional education sector as well and so naturally, these differences have traversed to find space in online education as well.

India faces a major gender disparity in access to the Internet. In fact, women only constitute 30% of India's total users (IAMAI, 2019). Further, even if the basic provision of Internet and electronic facilities is available in the household, cultural norms do negatively influence girls' participation in online education. The patriarchal roots of our family structures have a very direct impact on access to resources. In a study conducted by Kakar (2012), it was observed that

technology was still very much viewed as the “exclusive province of men”. The cultural expectations held for girls to be quiet and shy might act as an internal deterrent in an online classroom, a space where male students assert their opinions and use profanity to establish dominance. “There is basic scepticism about women using phones. Parents tend to keep them away from phones as they fear that it might have a bad influence on them,” noted a spokesperson from Justice People’s Campaign in conversation with SheThePeople (2020). Moreover, the pandemic and being locked inside the household also added to an increased burden of domestic work on young girls. According to a study conducted by International Labour Organisation (2018), Indian women perform 297 minutes of unpaid household work every day, as opposed to men whose contribution is a meagre 31 minutes. In such a scenario, it is clear that education will not be one of the top priorities for young girls.

5.5. Effect on Socio-Economically Disadvantaged Groups: The Case of Caste & Class

Apart from gender disparities, the inadequacy of online education becomes more pronounced within the various social groups who have been historically marginalised, even from traditional education. Thus, caste and class distinctions also permeate into the discourse of inaccessibility of online education. This digital divide is strikingly apparent when we note that 89.3% of Scheduled Tribes and 85.7% of Scheduled Caste households whose children are enrolled in school do not have access to internet facilities (MS & Siddiqui, 2020). Such difficulties, naturally, take a toll on the minds of young and bright children. The unfortunate case of a Dalit student in Kerala who took her own life due to lack of facilities is one instance where the fatalities of online education are highlighted (Philip, 2020).

“Today, people are talking about maintaining two-metre distance and social distance but Dalits, in India, have been socially distanced for thousands of years,” stated Mayank Dohare, a visually impaired Dalit student from Noida, Uttar Pradesh (Khan, 2021). Indeed, the oral testimonies of students from marginalised castes are haunting. What must also be considered is that these inequalities were not borne overnight due to the pandemic or digital learning. Offline face-to-face education had its own systemic issues pertaining to caste and class exclusivity, the online mode has simply accentuated them even further. Moreover, online learning also demands

a conducive environment for studying, yet this remains a luxury for many. In poorer joint-family structures, often they live in a single-room house with shared washrooms, which results in a dire lack of a quiet learning space.

Class differentiation and urban-rural divides must also be considered. Research reveals that within the poorest income groups, only 2% of students have access to computers with the internet, 3% have access to computers at home and 10% have access to the internet through any of the digital devices (Reddy et al., 2020). The increasing echoes of ‘Digital India’ do not sufficiently address the educational inequalities that have emerged as a crisis in the caste and class struggles of India. Moreover, scholars say that the loss of more than a year’s worth of traditional education would have dire effects on the future schooling of students from rural areas and poor parts of cities. This, in turn, suggests that inaccessibility to online education for poor communities would further accentuate the rich-poor divide while simultaneously creating ‘new digital divides’ (Devara, 2020).

5.6. Effects on Students With Disabilities

The shift from traditional to online education also poses a grave challenge for students with disabilities. In a recent report to survey this impact, findings revealed that out of 387 students with disabilities, around 56.5% of students said they were “struggling, yet attending classes” irregularly, while 167 students had decided to drop out and not continue with further studies (Swabhiman, 2020).

Close scrutiny is required to uncover why online education, in its present form, is unable to accommodate the needs of students with disabilities. Although the recently announced PM eVidya platform by the central government hopes to cater for learners with visual and hearing impairments, more information and implementation strategies are required to effectively address how online education can be made more accessible. For instance, students having visual and hearing impairments stated that the lack of subtitles or sign language interpreters in video lectures makes it hard for them to concentrate on the curriculum. For children with intellectual disabilities, a greater desire for individual attention, social interaction and routine hindered the effectiveness of online classrooms. Children with Attention Deficit Hyperactivity Disorder (ADHD) reported that it was particularly hard to sustain their attention during online lectures,

and further stated that the teacher's inability to properly engage with them made the process worse. Children with autism have also reported that getting through the day without a change in routine made it hard to pay attention (Vidhi Centre For Legal Policy, 2020). In this context, the involvement of parents (with children with disabilities) in the management of classes has also substantially increased. However, unlike special educators, parents don't feel fully equipped or trained to take on all the responsibilities required to finish the school curriculum whilst juggling their professional and household commitments as well (Pacta, 2021).

5.7 Lack of Transparency during Conduction of Examinations

One of the major weaknesses identified in online education is the lack of transparency and hence, the lack of an effective assessment strategy for students. Mainly, two types of examination styles were observed in the major schools and colleges of India - proctored and open book examinations. Ashri and Sahoo's research (2021), specifically focusing on the conduct of online open-book examinations at the University of Delhi brought to light some key points. They argue that Indian academic institutes are simply not ready to adapt to such a new, alien system as open book examinations. Further, the hasty development of the OBE portal resulted in various technological glitches, which led to many students being unable to submit the paper within the stipulated time. Additionally, it is also important to note that the very concept of open-book examinations tends to make students solely reliant on their textbooks, without any application of rationale or logic (Ioannidou, 1997).

Many instructors use remote proctoring technology, such as lockdown browsers or webcam monitoring, to simulate the strictness of in-classroom invigilation. These proctored examinations pose their own set of challenges. Firstly, some forms of proctoring might be discriminatory towards students with disabilities. They might be more likely to have their environments or behaviour flagged as "suspicious" by algorithms. Moreover, concerns have also been raised about the ethics of surveillance and after evaluating case studies, these concerns seem to be well-founded. For instance, students at Christ University reported the inappropriate behaviour of a proctor monitoring the online examinations of its students. In a screenshot that was widely circulated, the proctor was seen referring to a student as 'baby' in response to a query about the examination (TNM, 2021).

6.0 Opportunities

6.1 Promotion of Skills

The transaction to online mode is different from the seasoned offline method. In some sort of way, it became a great challenge on the part of both students and teachers. Students are challenged to adjust according to the online environment and to learn the course content online. A consecutive behaviour pattern was observed amongst students and teachers due to this online method of education. As students were new to the format, so instructive communicating skills were acquired by the teachers and then were imparted. As new students enter, they require assistance with the tone to familiarize with the new teachers on changing classes or maybe shifting to new schools, etc, hence, assistance with adapting to tone online was another important skill that was incubated amongst both teachers and students to adjust according to this new format of learning. Awareness has also been one of the key features of this as meeting in person gives you a sense of analysis of what is appropriate and what isn't, whereas meeting people online requires a certain level of awareness.

6.2 Opportunity to Maintain Work-Life Balance

Despite how hard it was to adjust to the online method, one key element was flexibility. It not only saves time but also provides us with the opportunity to maintain a work-life balance. It provides us with the opportunity to pursue higher studies despite commitments such as family, employment, financial responsibilities, etc. Pursuing higher education online may help the employee in building new opportunities in their stream. Moreover, universities offer a limited number of seats for higher studies to graduates in the offline curriculum, so a large portion of students are not able to pursue it further. Alternatively, online learning through different courses does not demand such logistical difficulties hence students are able to initiate the process easily. Hence, online learning bridges the gaps and provides us with the opportunity of pursuing higher education and maintaining a work-life balance along with the responsibilities of day-to-day life.

6.3 Provides an Environment-Friendly Approach to Teaching

The medium of online education provides an opportunity to make the global approach to education a lot more environmentally conscious. In a traditional offline schooling system,

schools use high levels of energy for power, electricity, heating and cooling systems. In a virtual set-up, these facilities are no longer required on campus and thus, online education significantly cuts down on energy consumption. Further, carbon emissions that arise from transportation through school buses, cars etc. are also reduced. The shift to virtual education in the long-run can provide us with one of the valuable strategies to reduce one's carbon footprint. However, we must also note that the carbon footprint is reducing at the cost of multiple people losing their employment and livelihood during the pandemic and therefore such statements should be interpreted in its holistic sense. At present, India generates the most waste globally and unless measures are taken, these numbers are expected to rise substantially by 2050 (The Times of India, 2020). In such a scenario, it is important to note that paper also constitutes a large portion of India's wastage and is one of the leading factors for deforestation. On an average day, paper is used significantly in offline schools in the form of exam papers, answer sheets, notebooks, notifications, circulars, posters, report cards, certificates and many more - yet, the pandemic changed everything overnight. Deepak Mittal, President of Federation of Paper Traders Associations of India corroborated this by stating that the education sector is responsible for 60% of the total market demand for paper, and that their shutting down had a direct impact on its demand. According to him, the printing segment in the paper industry was one of the worst affected sectors after the pandemic owing to its huge reliance on the education sector (Kumar, 2020). In light of this, online education offers the digitalisation of the entire learning process, which can substantially decrease the demand for paper consumption by schools and universities. This can usher in a more environmentally conscious era for students and institutions, alike.

7.0 Threats

7.1 Change in Evolutionary & Studying Patterns

The application of online education, in the long run, can pose several threats. One of the most significant threats is the change in evolutionary patterns that increased reliance on technology will bring forth. Research indicates that children are increasingly finding it difficult to hold pens and pencils due to excessive use of technology. Paediatric doctors have argued that the overuse of touchscreen phones, tablets and laptops significantly hinder children's development of finger muscles (The Guardian, 2018). Moreover, after measuring the brain

activity of children and young adults, studies have proved that handwriting and drawing engage the brain far more than typing on a keyboard. (Askvik et. al., 2020). The decline in writing by hand is already emerging as a popular phenomenon among students. If the sole reliance on online technology continues in the long run, then this, in turn, will forever change how we study and write.

7.2 Rise in Cyberbullying & Cyber Crimes

A shift to virtual platforms, in the long run, can lead to an increased risk of cybercrimes and cyberbullying. In the past year alone, cyberbullying of Indian teenagers and women rose by 36% (CRY, 2020). In a letter to schools, the Directorate of Education (DoE) admitted that “The internet spaces are growing and multiplying and data security, privacy and protection is inadequate to keep a check on this. It is important that everyone is aware of the risks that could be associated with being connected to the internet” (Hindustan Times, 2021). Parents are rightfully concerned about the rise in virtual classes since students would spend more time online. According to a study by McAfee Corp, 55% of Indian parents believed that it might lead them to view illegal content and 53% were worried about children sharing personal information; exposure to scams (53 per cent), cyber-bullying (52 per cent) and misinformation (49 per cent) were also highlighted as concerns (The Indian Express, 2021). Yet, apart from vague guidelines being circulated, there is not much tangible control that schools can enforce with respect to cyber threats. A prominent girls’ school in Kolkata had to suspend Zoom classes after hackers sneaked into a VI-grade classroom and displayed obscene videos on the screen. They also abused the students and threatened them with rape and murder (Pandey, 2020). Similarly in another case, an unknown man hacked into an online class in Gujarat and allegedly started masturbating (NDTV, 2020). Such cases are increasing day by day and an absolute switch to only online education in the future would only encourage an upward trend.

7.3 Phenomenon of “Learning Loss”

The most alarming threat that online education poses is the widespread phenomenon of “learning loss”. Indeed, as concerning as it may sound, Azim Premji Foundation evaluated the extent and nature of ‘forgetting or regression’ kind of learning loss (i.e. what was learnt earlier

but has now been lost) that was being witnessed among children in public schools across primary classes due to the closure of schools. The study revealed that 92% of children on average had lost at least one specific language ability from the previous year across all classes. The field research surveyed the students on reading comprehension, fluency and writing skills. In terms of mathematical concepts, 82% of children on average had forgotten at least one of these abilities: identifying single- and two-digit numbers; performing arithmetic operations; identifying 2D/3D shapes; comprehending and drawing inferences from data (Azim Premji Foundation, 2021).

A teacher from Rajasthan shared her experiences with her students and stated, "Reading has become a bigger problem than before across grades. Students of class 6 could not answer even the story-based questions or get the meaning of the text. In other words, we can say that they can no longer read with comprehension. The situation with writing is even more troublesome – in the writing section, only one student of class 3 could write a sentence without errors." (Azim Premji Foundation, 2021). Reading and writing are one of the most powerful tools that we possess in order to break barriers and rise in an unjustifiably unequal society, yet the regression in learning that is currently being observed in online classes seems less than sufficient in solving the gap. The threat and severity of learning loss among primary grade students must be dealt with at once, else an entire generation of bright students will be wronged.

8.0 Recommendations

As discussed, the reopening of schools is essential for holistic and equitable education. While many inequalities exist across traditional offline forms of education as well, the aim of our study has been to evaluate the nature of online education in the Indian scenario. Through our study, we have been able to highlight the stark learning gaps that have emerged as a result of the online education model that has been used extensively since March 2020.

The case of COVID-19 has made it increasingly clear that we need to fundamentally enhance the online education ecosystem in India. Our research has shown that lack of digital infrastructure was one of the key weaknesses of online education and therefore, our primary recommendation would be to invest and develop digital infrastructure across schools in India. There needs to be a sustained effort in setting up parameters regarding the quantity and quality of digital equipment and the requirement based on the number of students per class. If such a

strategy is applied, the consistent and more importantly, equitable distribution of digital equipment would come to fruition. To bridge the digital divide and to ensure transparency in local school governance, central and state governments should work towards mandating a steady source of funds to ensure equitable digitalisation. Moreover, alternative funding sources such as through donors can be encouraged, however, it should not act as the sole authority and systemic measures need to be laid.

Secondly, the quality of online education must also be effectively looked at and the loopholes need to be corrected. Accessibility is one task while ensuring quality is a whole another. As we have seen, regression in learning has emerged as a popular trend during the pandemic. To remedy this, the curriculum and assessment in an online platform need to be more application based rather than rote learning. Digital content should be curated to be subject-specific and contextualised according to age. In fact, online education and open-book examinations, if utilised effectively, can result in more skilled workers who are able to meet the demands of the industry. Therefore, the present curriculum needs to be revamped to include conceptual and hands-on learning as well.

More importantly, teachers need to be trained with respect to technology. The online platform offers a plethora of options to enhance the learning experience such as screen sharing, breakout rooms, chat method, audio-visual material, PPTs, automated attendance system, pop quizzes among others. Yet, these features are not utilized by teachers due to a lack of knowledge or rigidity in their methods. Online education can only be effective when teachers learn to be more flexible in adopting new technology, teaching practices and evaluation methods. The methods, expectations and implications of an engaging lecture in a traditional offline classroom are starkly different from that of an online classroom, and thus the approach to teaching must also accept and adapt to this change.

Finally, the online education system also needs to work towards facilitating conditions for social interaction among students. When we reminisce about our school days, we reflect on the friendship, frolic and fun of it all. Although important, we tend to forget about grades, teachers and the stress that school carries. The students of the online system, unfortunately, are not privy to this privilege. When it becomes increasingly tough to ensure even the attendance and participation of all students, social interaction remains a distant reality. It is crucial for the

personal and emotional development of students and thus, strategies need to be put in place to establish this aspect as well. This can be achieved through informal meetings, show and tell performances, group projects, cultural events, art, music and dance classes, virtual field trips, charades and many more.

9.0 Conclusion

Through comprehensive SWOT analysis, our study aimed to explore the sustainability of online education in the Indian context. As observed, the weaknesses of online education far outweigh its strengths, not just quantitatively but qualitatively as well. The threats, too, are greater than the opportunities that online education in the long run could offer. In such a scenario, we conclude that online education cannot possibly be a sustainable solution to the Indian education crisis. University Grants Commission's recent approval in letting the top 100 NIRF ranking institutes offer 100% online degrees is highly concerning (The Hindu, 2021). Complete reliance on an online model of education will create a significant digital divide among the Indian population that will be hard to bridge. The resolute faith in a 'Digital India' is being advocated in a country that currently does not have any semblance of equitable digital infrastructure. Online education in India, in its present form, simply cannot exist without severely threatening marginalised sections of the population. In offline modes and institutions, the students are able to foster a climate that is socially, morally and intellectually stimulating by engaging in both conversations and debates. As mentioned previously, the online mode of education is unable to guarantee such environments. Thus, schools and universities should be reopened as soon as it is safe for all stakeholders. However, it is important to note that online education is not an absolute evil. Owing to an evolution in technology, online education was able to successfully act as a bridge to continue an adjusted form of traditional education in the midst of a global pandemic. That, in itself, is something to be grateful for, yet we should not let sentiments overrun rationale.

Going forward, blended learning which incorporates both offline and online modes of education can also be considered. The online methodology can never replace the core practises of classroom education, and therefore at best can be considered ancillary in its role to traditional education. COVID-19 and the nationwide lockdown has revealed significant gaps in our

education system in terms of accessibility, effectiveness and impact - in both offline and online learning. These lessons should not simply be forgotten once traditional face-to-face learning is feasible again. The intense hardships that students have suffered since March of 2020, almost two years ago, need to be considered and rectified for India's future generations.

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