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शिक्षा विमर्श

शैक्षिक चिंतन एवं संवाद की पत्रिका

*A Special Issue on
Digital technologies and Education*



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Demographic Digital Dividend?

The Covid-19 pandemic led to school closures across the country. Since March 2020, schools were closed, primary schools the longest, for almost two years. Ever since, the use of 'EdTech' (a moniker for digital technologies in education) has become much more common, with many schools and teachers imposing it on students and parents. In this context, we felt a need to publish an issue on EdTech, reviewing this phenomenon from a critical understanding of education and the perspectives of research and practice.

Digital technologies are also referred to as 'new information and communication technologies (ICT)'. Like earlier ICTs, such as language, script, print, and mass media, digital technologies support our information and communication processes. What is 'new' or distinguishing about them is the processing of information in the 'digital' format. The digital format of information has led to an explosion in its access, creation, storage, and dissemination. Digital networks have made communication, networking, and outreach cheaper and easier. Digital technologies also provide 'interactivity', unlike earlier ICTs.

These features of digital technologies helped teachers use digital technologies to connect with students and parents during school closures caused due to the pandemic. The articles in the issue study projects that have integrated technologies into education, both through online educational programs and the use of devices, software, and content in in-person classes. There are a few articles that point out the harmful possibilities of digital education, including from pedagogical, political as well ethical aspects. In the case of a pilot in Orissa, Dr. Vaijayanti Kurukundi shows that children acquired competencies in Mathematics when they explored "e-content" shared by trained village volunteers on digital tablets. Here, content and approaches designed by experts were carried to community learning centers for volunteers to work with children. Similarly, Dr. Ajita Deshmukh writes how an online course supported students in different locations to try out Chemistry experiments and projects in their homes, using "game-based learning" to enhance student engagement and motivation.

While these papers demonstrate that technology can be useful to support learning, perhaps asking, "Are digital technologies useful?" is as incomplete a question, as asking, "Is a knife useful?" This means additional questions on 'when/how/where' and 'cost/benefit', both absolute and relative, must be raised to make this discussion meaningful.

Programs that declare digital education to be successful from the evidence gathered from a pilot, usually refrain from engaging with this comprehensive assessment. In the case of digital technologies – as these are often expensive, fragile, and prone to failure, requiring frequent renewals – the first parameter would need to be cost implications for universal implementation. That, for instance, would make the Orissa pilot (one tablet per child) impossibly expensive. One can argue for a phased implementation, but given the fragility of the devices, their life would be too short to often allow for replacement on failure. A second parameter would be the opportunity cost of the program. Would the same financial resources be better used for books for the library or keeping toilets functional? While, often, digital technologies have been pushed by administrations onto schools, should not the schools/teachers have a say in deciding if they want to use the same funding for other priorities that they may have? Would this provide an opportunity for teachers to have conversations amongst themselves, with parents and local community members, with teacher-educators and other experts, to discuss what their local contexts most need? Yes, this would take time, but then the investment made with the local buy-in would likely be used well, while digital devices pushed on schools, often languish in their boxes, unopened.

A third parameter would be to explore if the program had several components, what was specifically the impact of technology? In the case of the Orissa pilot, what was the role of the village volunteers? Could the content in the tablets have worked without the volunteers' explanations? Would these volunteers have done better with more preparation even using digital technologies? So, what is the value or benefit one could ascribe to the technology itself (research methods that use control groups may be able to answer this question)?

A fourth question would be, what does the introduction of technology take away/what active harm may be caused? For instance, do young minds get more easily addicted to digital technologies? More prone to manipulation through apps? More vulnerable to theft of data about them, which can be harvested by EdTech companies? How does the vendor lock-in with the use of proprietary technologies affect the public system? The late educator, Neil Postman, argued that every introduction of technology creates winners (who benefit) and losers (who are harmed), and the winners try their best to “convince the losers that they are the winners”. Teachers and parents beware!

Apart from the cognitive and technological dangers, we also need to consider the impact on equity. Ms. Kavita Rajeshwari points out that power, network connectivity infrastructure, and device and data affordability were real issues affecting many, obviously more so, the socio-economically marginalized groups. Ms. Garima Rath's paper shows how even a small difference in geography (of just 5 kilometers) can create two different worlds of digital education and provide very different levels of exposure to children. Ms Disha Sharma brings a similar focus on educational inequity, in the higher education space. India reports the highest number of deaths among youth due to suicides, which in most countries is the fourth or later rank as the cause of death. Suicides and mental health issues are therefore part of our 'demographic digital dividend', which policy-makers must address.

The pedagogical aspects of online education are visualized by Vinod as a grave challenge to the classroom as a sacred space of learning and community. He worries, “.... Will teachers

be reduced to consultants or gig workers, and students to consumers?” Amid the University Grants Commission (UGC) declaring online education to be equivalent to in-person education, Ms. Prakriti Bhargava highlights the importance of interaction and intimacy of the physical space in the microcosm of a university. If universities are indeed the crucibles for building a better society by invigorating young minds to visualize and work for better societies, the push for the online can be a dangerous setback to any aspirations India may have of becoming a developed country, let alone the Vishwaguru.

Instead of centralized prescriptions from the UGC on how much the digital needs to be blended with the real, the solution, perhaps, is in building teachers’ abilities to engage with technologies, not merely as ‘users’ but as ‘critical participants’. Rajaram Sharma argues, “the issue, you will recognize, is not about technology. It is about what we wish to do with it. Engaging with technology, experiencing it, and exploring how it can be used will enable the teacher to focus on creating the best learning environment”. In addition, teachers’ ‘digital literacy’ has to include awareness about the harmful impacts of digital technologies on young minds, amidst the push by EdTech vendors to promote their digital offerings. Ms. Anusha Sharma’s article on the new “Artificial Intelligence avatar” of EdTech highlights the dangers of hollowing out education processes and systems, due to inimical dependencies from vendor lock-ins.

Prof. Anusha Ramanathan’s article suggests that AI enhances the interactivity quality so much that (by Alan Turing’s definition), the responses are “human-like”, and moreover, these interactions are used by the “machine to (further) learn”. This can help design novel multilingual approaches to language teaching through dynamic language translations, yet the teacher has to be responsible, and have the authority to design and transact.

Such teacher preparation for enabling her to appropriate digital technology is firmly within the teacher education (higher education) space. But higher education itself is in an existentialist crisis as Mr. Binay Kumar Pathak’s article points out, with trends (riding on digital technologies) unmistakably indicating a push for globalization, privatization, and commercialization of higher education. This is one area where a failure of “Make in India” program will damage us as a country and society. If instead, we can use digital technologies to provide additional exposure and learning opportunities to teachers and students, without removing valuable interactions, and strengthen public institutions and public education, it would create a higher education system that is relevant to the needs and concerns of our youth and society. For this, teacher-learner agency, institutional autonomy, and systemic responsiveness to socio-political contexts must be the primary drivers of EdTech design in education ◆

Mr Gurumurthy Kasinathan
Guest Editor
(Director, IT for Change)

What Technology Should I Use in My Class?

A discussion on the potential and purpose of technologies in teaching-learning

Prof Rajaram Sharma

The past two years of our careers have been extremely challenging. Never during our teacher training did anyone refer to such a situation or mention how to handle it. We always believed that the job of a teacher meant going to school, where we would meet students. We would teach, and the students would learn.

However, since the Covid-19 outbreak in 2020, India's schooling system has been derailed. For more than two academic years now, we have been forced to keep children away from schools. The disruption of physical classrooms was rather abrupt, and most of our schools didn't have the time or the know-how to redesign their syllabus and prepare us for the new situation.

How Do We Teach Students Who Are Not In Front Of Us?

After the initial panic caused due to the virus and the first nationwide lockdown, we began to explore alternate means to reach out to students. Some suggested that we use the internet. Schools that were well equipped could ensure that all students were connected. They could also expect parents to help out. These schools had a better chance to adopt a new method of teaching called online classes. But what about schools that did not have such facilities? Different schools tried different ways of reaching out to students and restoring their academic schedules. For instance, we learned on-the-job how to teach through a mobile phone. Some enterprising colleagues also figured out how to get students to participate, how to assign homework, and how to conduct tests. Most of us merely coped.

We hope that soon the pandemic will be past us and schools will resume conducting physical classes regularly. We also hope that such a disruption will not occur again. But what if it does? Also, what have we learned from our experiments with technology, so far? Can it be used more often? Can it help do something that we could not achieve in our classrooms earlier? Did it help students in any way? Did it help us (teachers) do our work differently? Did it make our task easier and more effective? Or did we promise to not go anywhere near an online class ever again?

Depending on what technologies and techniques teachers were forced to adopt, different teachers will have different opinions about what worked, what will work, and what changes they may have to make. However, all of us have achieved a level of familiarity with technology, enough to help us ask some critical questions about it.

Assuming that modern information and communication technologies are useful and do make teaching and learning more efficient and joyful, let us explore them to see what issues we need to address. More than becoming an exploration of hardware and software, this is an opportunity to analyze how technology can help us teach differently, save time and effort, and aid us in doing tasks we always wanted to, but our classrooms did not allow.

Issue 1: The Choice Of Technology

Computers connected to the internet can perform a wide variety of functions. We see different people using them for different tasks. Earlier, we only had desktop computers. This was the case in computer labs in most schools as well. Nowadays, computers come in a variety of shapes and sizes. We have seen laptops, tablets, smartphones, and even televisions connected to the internet. Many of us have one or more of these devices. In a way, all of us have figured out how to connect to the internet and to each other. We all use information and communication technologies (ICT).

Of course, while most of these devices can be used to do many things, not all of them perform the same functions. At least, they do these things differently. A smartphone can be used as a camera. It can also be used to make video calls. But typing a document is rather difficult. A desktop or a laptop has a variety of software applications and can perform a variety of complicated tasks that smartphones struggle with, say analyzing data or coding. So, if we have to adopt ICT for teaching and learning, what devices, applications, and accessories should we choose?

First on our wishlist should be an internet connection for every student and teacher.

Some of us may have a choice of devices. Many of us, may at least, have a smartphone. But the same cannot be guaranteed for every student. Teachers should make an assessment of how many students they will be able to connect to. They should also assess what kind of devices they can access, what features do those devices support, will they have access to it

all the time, will they be sharing the device with their parents or siblings, how good is the internet connection where they live, is it available all the time, etc.

Arriving at a common minimum time, when every student can be simultaneously connected, is essential to decide when we can conduct an online class. And when we say every student, we mean each and every one of them. After all, this exercise is being done so that we can help them with their learning. Many of us, even without a systematic survey, can safely conclude that such a situation is impossible. But then, we need not consider an online class at all. We only need to connect with students. This can be done via telephone calls or notes and worksheets sent as messages or emails, use of the regular postal system, children living close to each other, thereby sharing access, etc., and there can also be many other ways by which we remain connected.

Issue 2: Learning, Teaching, And Technology

What devices will suffice will largely depend on what we wish to do with them.

Learning requires that children actively engage with the acquisition of information; process this information; make it a part of their knowledge by constantly interacting with and reorganizing it; challenge themselves by attempting to apply the knowledge to solve problems; and present their knowledge in response to various situations in different forms – spoken, written, through art, as computations or problem solving, or as creation of products. Learning includes knowledge and skills; interests and habits; and of course, the ability to learn independently.

Teaching has to aim at all these aspects. A teacher not only has to communicate information, she has to also arouse the interests of her students and package the information according to their level of understanding. She explains, describes, demonstrates, and sets tasks and problems to challenge students. She helps them practice their skills. She also creates opportunities where students can evaluate their learning.

Can ICT help with all of these activities? Can it enable a student to learn? Can it help a teacher teach? Can it help to communicate, provide practice, and challenge and evaluate learning? What software applications will be required? How can we use these applications?

The issue, you will recognize, is not about technology. It is about what we wish to do with it. A focus on learning is what we underscore. The earlier students become adept at learning, the more independent they become, the more they can learn, the less they depend on teachers, and they can be motivated to explore further. Technology, for such students, opens the doors, and the World Wide Web can truly connect a student to the world. It also means teaching-learning is no more defined solely by teaching. The classroom, be it an online class or an offline class, can transform into a space for debate, reflection, and collaborative learning. Classroom time must be put to much better use.

Issue 3: Does It Work With All Children?

Most people outside the school system fail to distinguish between the capabilities of children of different ages. In fact, most technology solutions proposed for education suffer from this limitation as well. Teachers in schools deal with children between the ages of three and 18. And this entire range is a stage of continuous, rapid development. Children in each age group have different levels of learning. In fact, even within each age group, one child is different from the other.

The best way to handle such a situation is to find ways of setting each student on an independent path. The faster they can take on the responsibility of driving their learning, the easier this task becomes. For a teacher, today, exploring ways of achieving this is very critical.

Based on a general understanding of psychological development of children, one can expect children, by age 10, to acquire a good working knowledge of language – read, write, listen, and speak fluently with a fairly large vocabulary and grammatical accuracy. And while one child differs from the other, adequate opportunities, challenges, and attention to difficulties faced by every child can ensure that all children in a class reach closer to this goal.

The result will be that all children can begin to read their textbooks, comprehend instructions, do their homework on their own, and in fact, even use technology to undertake a number of independent activities.

By age 13, they should be able to independently drive their own learning, set tasks for themselves, independently explore information, seek knowledge, engage in cooperative and collaborative activities, and with each other's help go beyond the normal confines of their syllabi. ICT can best serve students who are able to use them to learn on their own.

At the same time, the nature of teaching-learning at different grades will be different and organizing learning experiences come with different challenges for teachers. The nature of learning experiences, activities, evaluation, and the use of technology support for each class will be different.

Issue 4: Learning Technology And Teaching Technology

So far, we have distinguished between learning and teaching. We also tried to identify different aspects of the learning process. The requirements in each of these aspects will be different. ICT can be designed to support each of these differently. Intelligent choice of the appropriate curricular experiences and challenges to be posed to the student can engage the student and foster learning.

We also examined teaching and identified different activities aimed at enabling different aspects of learning. Teaching also requires different ICT techniques and resources to support different activities. What can support explanations or descriptions? What is required for a demonstration? What experiences can pose problems and challenge students? How can ICT be used to evaluate learning? Which aspect of learning is to be evaluated?

Schools use different domains of knowledge – languages, mathematics, science, social sciences, arts and crafts, games, and sports – to support different kinds of learning. Each of these domains requires unique learning experiences, has unique content, and therefore, requires unique ICT support. Text, audio, video, graphics, photographs, data and data visualizers, calculators, and computing applications can all serve learning in unique ways. A video or animation cannot do what a data sheet visualized as a graph can do. Not all teaching techniques lend themselves to visuals. In fact, not all learning requires digital technology support.

Based on the development of capabilities to learn, children at different ages will require different learning experiences. Activities and audio-visual resources may be more appropriate in lower classes, data and graphs more relevant to higher classes. Teacher guidance may be essential for younger students, while opportunities to explore on their own more appropriate for older students. Technology is best used for creation and problem-solving. Children at different ages can be exposed to different levels of creation and problem-solving.

What is to be learned decides how it should be taught. And what is to be learned and taught decides how technology will be utilized. The choice of hardware, software, the activities designed and the learning demanded define the success of the educational program.

Issue 5: What Should Teachers Do?

The prescription is: no technology, low technology, select technology, and appropriate technology.

We all function under unique constraints. Every school is different and every group of children poses unique challenges. Changing circumstances will expect us to change. The foregoing discussion tried to help you appreciate this as an opportunity. We also saw that the primary purpose of education – enabling the growth of children into sensitive, capable, and responsible citizens of the world – is why we undertake teaching and learning.

Once we appreciate the unique situation we work under – what conditions we have to adjust to, what support we are likely to get, and what technologies we can afford – we should be able to work out the best ways to achieve our goals.

Rather than defining our tasks in terms of teaching – completion of syllabi, conducting examinations, etc. – we suggest a shift in focus to help children become independent

learners at the earliest and thereafter, pursue their learning on their own. This, we argue, will help teachers grow into facilitators and guides, finding the time and space to support each student individually.

Technology can play a wide variety of roles and if intelligently planned, it can relieve the teacher from a large number of tasks. It can remove the burden of mundane tasks and provide opportunities to raise the level of knowledge of the class. It can foster creativity and widen outlook.

Allowing technology to define the nature of transactions will begin to limit what can be achieved. Online, offline, synchronous, asynchronous – all forms of communication have a role to play; text, audio-visuals, graphics, and computing, similarly, serve different aspects of learning; and desktops, tablets, smartphones and the variety of software applications that can be served through them enable different types of learning experiences. Some situations do not require technology at all; some require very low technology; and some need select technology. In general, the choice of appropriate technology, serving the needs of the students and teachers is the most appropriate solution.

Engaging with technology, experiencing it, and exploring how it can be used will enable the teacher to focus on creating the best learning environment. Give yourself time, enjoy the process, and you'll realize that technology can indeed become an able assistant to you ♦

Online Teaching in a Pandemic World: A Comparison of two Private Schools in Odisha

Ms Garima Rath

Abstract

This article is an attempt to understand the online teaching process that became the new normal due to the Covid-19 pandemic. It is based on a comparison of online mode of teaching in two private schools in Bhubaneswar, Odisha over a six-month period. These schools were selected through snowball sampling and classes were observed online to understand how teachers disseminate knowledge to students in the online medium. Stark differences were observed in the way online classes were held in the two schools in terms of the availability of electronic gadgets and internet connectivity. Highlighting the conflict theory in sociology of education, this article argues that online mode of teaching has only deepened the inequality that schools generally reproduce.

Keywords: Pedagogy, online classrooms, inequality, accessibility.

Introduction

Education undoubtedly is one of the most important forces in any society. It is a symbol of societal progress and acts as a marker of how developed a society is. There have been numerous policies by stakeholders at the global, national, and local levels to make education accessible and improve its quality. It is important to analyze how the processes of teaching-learning affect students to ensure quality education reaches all irrespective of

their socio-economic backgrounds. To understand the same, understanding the physical space of schools is critical. However, because of the Covid-19 pandemic, classrooms as physical spaces vanished for some time due to the social distancing norms aimed at containing the pandemic. The only other option for government and private schools was shifting to the online mode of teaching and learning.

In 2020, with the shutting down of physical classroom spaces, digital platforms such as Zoom and Google Meet, etc. were used to create virtual classrooms. These virtual classrooms demanded the availability of electronic gadgets (smartphones, laptops, tablets, etc), internet data, or Wi-Fi. These resources became a prerequisite to schooling, not only for higher classes but also for kindergarten and pre-schoolers. The education system in India thus saw a massive shift in terms of pedagogy which also meant that the responsibility of teachers increased manifold. Teachers were not only responsible for providing knowledge to students but they also had to engage the students and retain their attention and interest in learning in the virtual medium.

Situating in the context of the pandemic, this study compares the schooling practices of two private schools - Dayananda Anglo Vedic, (D.A.V) affiliated to the Central Board of Secondary Education (CBSE), offering English medium of instruction, and Saraswati Sishu Vidya Mandira (SSVM), affiliated to Shiksha Vikas Samiti, offering instruction in Odia. It focuses on studying how teachers have been disseminating educational content from textbooks in online classrooms. The conflict theory of education highlights the unequal role of education and how schools reproduce existing inequalities in society. The study aims to highlight how the pandemic has further escalated such inequalities through a focus on the curriculum, pedagogy and evaluation methods used in the two schools located in Bhubaneswar.

Context

Schooling practices comprise curriculum, pedagogy, and extra-curricular activities. This study focuses only on pedagogy and limits itself to online teaching. While most Odia medium schools are affiliated with the Government of Odisha, a few private Odia medium schools called Saraswati Sishu Vidya Mandira (SSVM) are affiliated to the state level “Shiksha Vikas Samiti” (SVS) of the “Rashtriya Swayamsevak Sangh” (RSS). However, unlike other states, the SSVMs use the same textbooks as used in Odisha government schools. They use some additional books of SVS on Vedic Maths, Moral Education etc. The study covers mainly history and political science subjects in sixth, seventh and eighth grades.

Methodology

The present study is an exploratory research that has used a qualitative framework. Since this study is a part of the doctoral thesis of the researcher, it involves an ethnographic account

of the pedagogic practices of the two above-mentioned schools. Classroom observations have been used extensively as a part of the research methodology. Since schools were shut and classes conducted on virtual platforms due to the Covid-19 pandemic, the study has included observations from the virtual classrooms as well. This article focuses on the observations from the virtual classrooms over a six-month period including a study of the textbooks used in the classroom. It has been informed by in-depth interviews of teachers who teach history and political science to sixth, seventh and eighth grades. Two principals were interviewed to understand how they dealt with the restructuring of the schooling system during the pandemic. The researcher has also had access to the WhatsApp groups that were used to provide information to students on a regular basis. During the pandemic, accessibility to schools became an issue, so the researcher used snowball sampling to select the two schools for the study and gained access to the virtual platforms that were being used for online teaching. The researcher also interacted with teachers of other schools to know about the commencement and continuation of their online classes.

Findings

This section will discuss the steps taken by the Odisha government regarding online teaching and compare the online teaching practices of the two above-mentioned schools. Odisha launched 'Shiksha Sanjog Program (SSP)' in which teaching-learning materials were shared with students from different classes through WhatsApp. This program received appreciation from across the country, however, its efficacy remains unclear. Despite the initial perception of the success of SSP, the government could provide materials only to 36% of students in grades I to VIII. The Annual Status of Education Report of 2021 claimed that only 46.5 percent of Odisha's students have access to smartphones at all times. Such findings also highlight the severe educational loss due to the shift to virtual classrooms. The comparison of online teaching between the two schools helps us understand this further.

The research set out to explore how teachers were sharing information from textbooks to students in online classrooms? The DAV school located in an urban neighborhood ranks in the top five pass percentages amongst private CBSE schools in Bhubaneswar. Interviews with teachers revealed that their school started online classes in April 2020, initially through WhatsApp and later they also used Zoom, Google classroom, Tata ClassEdge, and YouTube to teach students. The teachers learned to use these platforms with the help of their Computer Science colleagues and expressed that they were technologically savvy. WhatsApp groups were formed for each section of a grade and class teachers, subject teachers, and parents were added. The groups became the platform for sharing information related to school opening, classes, timetables, examinations, notebook/homework collections, and school notices. Notes prepared by the teachers were shared with the students through these groups.

It was observed that DAV follows a structured routine. There are five classes in a day and the school runs from 9.40 am till 2 pm. The first ten minutes, even during online classes, are

reserved for prayers so the first period starts from 9.50 am. Each period lasts for 40 minutes, and each subject teacher has a particular Zoom link and password which are mentioned in the timetable. They are used by the students to log in. The teachers are required to teach by making notes or points which they generally show to students either through Microsoft PowerPoint or Word. Later these files are shared with students in their WhatsApp groups, and the students are supposed to write notes in their classwork book. The teacher makes a note of the number of participants in the online classroom and asks a particular student, who is generally referred to as the attendance monitor to take screenshots of the students present in his/her class and send her images after the class ends. Although not mandatory, teachers often ask students to switch on their videos to make sure that they are present and can engage in online classroom participation. The teacher ensures that after a particular topic/chapter is taught, related videos are shown to students, e.g. videos related to Prithviraj Chauhan, Indus Valley Civilization, or the various organs of the Central Government have been shown. These videos are generally from Tata ClassEdge or YouTube.

The students, sometimes have to share their homework through Google Classrooms, however, most often, the class teacher fixes a specific date when parents are supposed to submit the classwork and homework notebooks to the school. The parents, then collect those notebooks after the teacher has assessed these. It is important to note that even though schools are shut, teachers are required to be in school, bring their own laptops, and conduct online teaching. The internet connectivity provided by the school often does not work properly, and teachers have to use their phone's data instead. There are also online exams. These generally are multiple choice questions; the google link is shared to students and they have to write answers within a particular period (before the link expires), keeping their video cameras on. From this description, it is clear that students and teachers seem to have "successfully" adapted to the new normal of online teaching. Teachers ask, revise and scold students even during online classes and even though students speak about how they miss physical classrooms, educational content is transmitted more or less regularly through online teaching. The course is completed in time and teachers also engage in revision classes before exams.

However, one sees a glaringly different picture at Saraswati Sishu Vidya Mandira (SSVM). This school is also located in an urban setting, merely five kilometers from DAV, but students here tend to be from economically disadvantaged sections. DAV's monthly fees are around INR 5000 and SSVM's roughly around INR 940. Based on teacher interviews, it is evident here too that WhatsApp remains an important digital platform for online teaching. Here, WhatsApp groups are made on the basis of grades, so students belonging to different sections (generally there are four sections in each grade) are part of one group. These groups are operated by one "admin" who sends information related to timetables, exams and notes, and other information to the students. In SSVM too, online classes started in April 2020 and teachers were taught how to use digital platforms by the "Shiksha Vikas Samiti" (SVS). However, in SSVM there is no fixed timetable. Generally, the admin of the group sends the timetable the night before, where class timings are not mentioned. It is only on the same day that the admin shares the Google Meet link and asks students to join. There are three classes in a day, which occur for half an hour, with no fixed timing. Sometimes

classes start at 8.40 am in the morning and sometimes they start at 9.20 am or even later at 10.30 am. In online classes, there are more than 70 or 80 students since students of all sections attend the classes at the same time. The teachers never switch on their video, nor do they ask students to. The teacher teaches a topic by reading from the prescribed textbook; there is no use of software like Microsoft Word or PowerPoint. Sometimes, when a teacher begins revision by asking students questions from the text, more than half of the students exit the classroom. Sometimes, teachers do not take classes through Google Meet but rather share the notes of the topic that was to be taught through WhatsApp, and these are images of their handwritten notes.

Like in DAV, here too, parents are asked to submit their wards' notebooks and collect it after they have been assessed by the teacher. Teachers have to come to the school to conduct online classes. However, all teachers do not have personal laptops and generally use one which the school provides. Exams are conducted through WhatsApp. The admin sends an image of the question paper to the students and they are required to write the answers on paper which the parents have to submit to the school. A teacher confessed that everyone in the school knows that the students copy during examinations, but he asserted that copying is much better than educational loss. He talks about how only elite schools have been able to cope up with online teaching, while government and private schools like SSVM bear the burden of witnessing educational loss. This is not only true for rural areas but also for cities like Bhubaneswar. One teacher explained that the reason they have only 30 minute online classes is that many parents cannot afford expensive data packs or Wi-Fi connectivity at home. This is also why all notes are shared by teachers through WhatsApp in image format.

The differences in following a timetable, number of classes per day, duration of a class, use of various pedagogic tools, conduct of examinations, etc. is evident. DAV appears to have fully adapted itself to the pandemic situation while SSVM strives to provide online teaching to all its students. Such a difference is due to the vastly different settings (socio-economic conditions of parents and teachers, medium of instruction, affiliated educational board, school's history and ideology and other factors) that the two schools are in, which affects the schooling process and thus the educational experience of students. This further reiterates the unequal character of the schooling system.

This in turn questions the meritocratic claims of education. The functionalist theory of education argues that by focusing on the ideas of capability, hard work and effort; education helps students to attain success in their life. Such an idea is asserted by Talcott Parsons (1968) who believes that schools, by focusing on value of achievement and value of equality of opportunity helps students to prepare for their future roles in a society and move beyond their ascribed status. Such a view has been criticized by others, who highlight the conflict theory of education. The structural inequalities in society often make it impossible for students belonging to certain backgrounds to have access to appropriate and proper pedagogic tools. For instance, 2020 saw a high rise in student suicides. This was so, because many students, felt hopeless due to their lack of access to the new teaching system. The above study highlights how schools tend to be sites of politics. As Althusser (1971) argues, schools, in the modern era, have become a way in which the capitalist society reproduces

itself and its inherent structural inequalities by becoming the “Ideological State Apparatus”. There is a plethora of social science research that highlight the unequal character of schooling and schooling practices (Apple 1979; Bourdieu & Passeron 1977; Kumar 1991, Bowles & Gintis 1976; Pathak 2002; etc). This article brings out such unequal character of schooling by focusing on the pedagogic aspect of two schools situated in two divergent settings. This study tries to establish the argument put forth by Pierre Bourdieu (1977) that students belonging to a certain class, and possessing cultural capital tend to perform better in schools. In this study, DAV’s students, from socio-economically forward groups tend to possess various gadgets that help them attend online classes. This aids them in their future, while students from socio-economically backward classes bear the consequences of the digital divide that was already inherent before the Covid-19 pandemic. This digital divide has further accentuated the educational loss during the pandemic, especially for the students from marginalized socio-economic backgrounds ♦

References

1. Althusser, L. (1971). *Lenin and Philosophy and Other Essays*. New York: Monthly Press Review.
2. Apple, M. W. (1979). *Ideology and Curriculum*. London: Routledge and Kegan Paul.
3. ASER (2021) *Annual Status of Education Report (Rural) for 2021*. Retrieved from <http://img.asercentre.org/docs/aser2021forweb.pdf>
4. Bourdieu, P., & Passeron, J. C. (1977). *Reproduction in Education, Society and Culture*. London: Sage.
5. Bowles, S., & Gintis, H. (1976). *Schooling in Capitalist America*. London: Routledge and Kegan Paul.
6. Parsons, Talcott. (1968). The School Class as a Social System: Some of its functions in American Society. In R. Bell & H. Stub (Eds.), *The Sociology of Education: A Source Book*, Homewood: The Dorothy Press.
7. Pathak, A. (2002). *Social Implications of Schooling: Knowledge, Pedagogy and Consciouness*. Delhi: Rainbow Publishers Ltd.

Use of Artificial Intelligence in Education

Prof Anusha Ramanathan

What Is Artificial Intelligence?

Like many technologies, Artificial Intelligence (AI) can also be used to make tasks easier and simpler, reducing human effort through automation. However, while automation is primarily used for routine, repetitive tasks and follows a pre-programmed use, artificial intelligence goes beyond this. An example of automation can be seen in the use of spreadsheets wherein the functions such as finding sum and average are already entered. Whereas AI can be used for non-repetitive tasks such as analyzing data, creating data, and writing entire books. AI mimics human behavior (Turing the scientist who coined this term, visualized AI as a process which would be difficult to distinguish from human effort). Now the aim of many working on AI is to make it even excel human intelligence.

AI is expected to process, evaluate and even predict the future. Machine learning is the fundamental basis of AI. Just as humans learn from experiences and change their behavior based on these, AI-based systems too evolve as they learn from new data. Apple, Facebook, Netflix, Google etc. all use AI to understand customers and guide interactions. The businessman Elon Musk and the scientist Stephen Hawking, among others, have opined that as AI gets better, it can even excel humans at thinking and this could lead to the end of our civilization. While this dystopian view may not be true, it is a fact that AI, like humans, seeks patterns in data presented to it, adapts its learnings based on new experiences and tailors its responses to situations presented to it.

Today AI can recognize queries that have mistakes in them, throw up related searches that are based on our past surfing habits, the geography in which our IP addresses are located

and even link us to our other interests based on our search words. All this is done within a fraction of a second. AI is used to autofill phrases as we type based on our earlier typing matches. These autofills are unique to each person and also change as one writes newer phrases. This is a feature that many of us are already familiar with as we search online or type messages and so on. Today, even drawings can be recognized in a variety of ways and the systems are constantly evolving. See <https://quickdraw.withgoogle.com/> (home page image given below) as an ongoing experimental example of machine learning research. Thus ‘machine learning’ process allows the technology to keep learning from ‘experiences’ (which is really interacting with data), without requiring explicit programming for such learning.

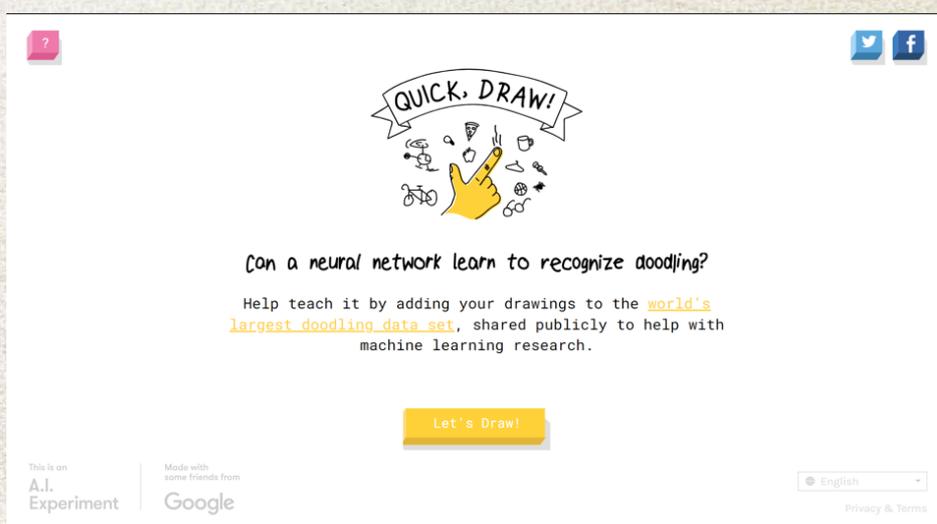


Fig. 1: Home Page of Quick, Draw, an image-based machine learning research

Another example is the ability of the Apple Watch, which monitors the pulse and decides if an alarm has to be raised regarding the health of the user. It has features that assess nearby hospitals and make distress calls to the appropriate contacts to ensure that aid reaches the person wearing the watch within the critical period. While the Apple Watch cannot replace an echocardiogram currently, it is able to read pulse, oxygen levels and proactively solve problems. Such examples are but precursors of how much AI can affect our daily lives.

Coming to the question, whether AI can really create content? Well, entire books have been written by AI! Search the internet with a simple phrase, “Books written by AI” to get an ever-expanding list of such books. In fact, there are sites one could go to create poems and stories using AI. One such TalktoTransformer (<https://app.inferkit.com/demo>) where you can try creating your own story. It is free upto 10,000 characters per week and does not even require you to sign up. The essence of the ‘AI’ here is that, an unaware reader would find it difficult to guess that these were not written by human beings.

Use Of AI In Education

Since education is all about 'learning', it would be interesting to explore how 'machine learning' can impact education. AI requires large amounts of data to 'learn' from and the Covid-19 pandemic has ensured that more and more data is being digitized and made available to systems. Use statistics of learning materials such as videos and PDFs, time spent on material, interactions with the materials are already tracked on platforms such as DIKSHA (a Government of India developed open educational resources repository). This in turn can inform creators what kinds of materials attract engagement. Like YouTube suggests the next set of videos to watch, based on its assessment of ones viewing preferences, the DIKSHA platform could suggest materials of nature similar to what the users have appeared to prefer. The platform could even create similar videos on its own, 're-mixing' bits from different other materials.

Machine translations (such as Google Translate) are improving continuously. Auto readers can read even unfamiliar words, though often with inaccurate pronunciations. We can not only choose captions in a language comfortable to us, but also have it spoken by a machine. Map applications already do this. This can have huge implications for education, by allowing the much larger educational resources available in English to be translated and made available in Indic languages to those Indian students who are not comfortable with English. The huge advantage English has, over Indic languages, of much larger volumes of educational resources, can thus be neutralized to a large extent. The main point is that, even if the automatic (machine) translation is not of good quality now, with increasing use, the quality will improve steadily and at some point, match and exceed translations by experts.

Conventional AI systems are already seen in monitoring such as recording attendance, sending automated mails to those with low attendance and such. These are more automated actions than AI-based. However, AI could be used to prompt students to attend, send them reminders based on tasks assigned to them, suggest deadlines, automatically update our calendars and set up notifications for us. Amazon's Alexa or Apple's Siri scan our speech and decide to dim lights, play music, search the internet, or even entertain us when we say we are bored. Perhaps, the future of education may lie in applications that study habits and guide students to content that might suit their viewing/learning habits. Thus, individualized pathways of learning could be developed using AI.

The most extensive use of AI in education is perhaps seen in China where it is used to monitor students' engagement with content. Some Chinese schools have robots that monitor students' well-being, their mood and engagement with learning, identify what sparks their interest etc (Wall Street Journal, 2020; Yoo, 2020). This experiment is expected to enable AI based decisions on placing students in appropriate learning circles, guiding students to specific content that will suit their respective learning styles and reducing the load on the teacher to choose materials for their students. This is also expected to open avenues for home-schooling which has emerged as a need in this era of disrupted learning. AI then seems to almost take on the role of the teacher to guide students to appropriate

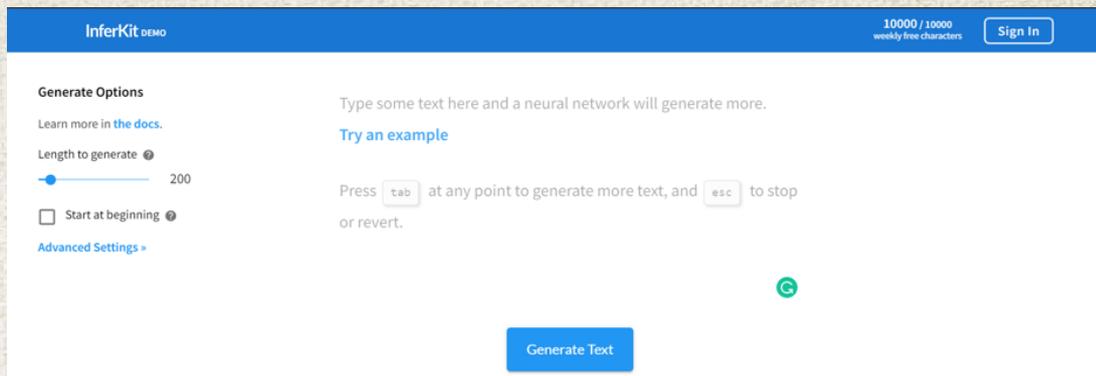


Fig. 2: HomePage of TalktoTransformer, an AI-based story generator

content, analyze student engagement and moods, predict student behavior and offer corrective strategies, document and even appropriately report to parents.

However, this begs the question - to what extent is the use of AI in education permissible, even desirable and where and when do we draw a line? Yuval Harari, in *21 Lessons for the 21st Century* (2018), speaks of the dangers of creating a 'useless class' among humans who are trained for work that can easily be automated. He highlights the need to make our education system more robust and focused on developing communicative skills, creativity and critical thinking so that our future generations may be ready to adapt to changes wrought by climate change and technological advances. Can AI be deployed to enable us to become more creative and be able problem-solvers?

Let us take the example of creativity. Mentioned earlier was the fact that entire texts can be written by AI. Today, as we use applications like Zoom or Google Meet, we are also given the option of enabling live transcription. Applications such as Otter (<https://otter.ai>) are used to generate transcription of lectures. Earlier when one would note-take, one would doodle, one would highlight, underline, draw, and create new short forms that only one could understand. Today with the availability of an artificial intelligence based application that generates verbatim notes of a lecture, what should the student do? As these notes maintain the linearity of the information presented, where would the students' creativity in organizing information, connecting ideas etc be accommodated? What abilities may be getting lost as a result of using this AI technology?

However, there are other counter questions to also explore: Is notetaking a critical role or an essential strategy for the student? Is it the only pathway to ensure learning or creativity of a student? If we can AI in our classrooms to save time and effort, without diluting meaningful learning possibilities, should we decry its use? After all, since the dawn of civilization, human beings have designed and developed technologies to enable a better lifestyle and to ease their labor. Then why not leverage AI? Still the question remains: how?

How Much AI Is Too Much AI?

There is no easy answer to how to deploy AI in education, and when, where and how much. The contexts in our education system are too varied for a 'one size fits all' strategy.

One way of responding to this, would be to identify the routinized tasks students do and understand the cognitive development implications of not doing those tasks, such as writing by hand when voice notes might type up better comprehensible and neat notes? We need to identify if other tasks might serve the same purpose of developing these abilities. We might want to develop the skill of writing, but more for purposes other than overtly utilitarian ones, much as we develop skills in drawing or craft or music in schools. The value of such classes for social-emotional well-being and the holistic development of a student is undeniable.

However, these classes do not cater to the industrial age requirements of using machines and engaging in commerce. Now as we have moved past the machine age, we might need to rethink societal values placed on productivity and occupation through work. If AI can do many of the tasks in a fraction of the time and effort required, then would there be a need for as many employees? If all do not find work, then would there be chaos? Or would we then develop newer ways to entertain ourselves? Would our work hours be reduced leading us to boredom that could lead us to be more creative? Would there be less stress as people had more time? Would there then be more tolerance? It should be noted these questions are not new, the renowned economist Keynes articulated similar thoughts during the industrial revolution. Perhaps an analysis of the history of labor saving machines may give us insights into the future of work under AI.

AI is here to stay. AI gets better as it learns continuously from big data that it feeds on. This need not portend a tragedy. If we can reimagine education, if we move out of an industry catering mode to preparing our future generations to be adaptive, to be holistically developed, then perhaps AI can be a lever to accomplish our goals. AI can be used for the good, however, the direction of AI depends on who controls its design, development and use. Currently, it is largely in the hands of for-profit proprietary technology companies such as Amazon, Apple, Google, Microsoft and Tesla.

We need to be vigilant about the AI production modes. While 'free' AI services may be made available by the Big Tech companies, the reliance on blackbox algorithms can reinforce social inequities and false beliefs. While customers who can pay (with their money or with their data) may be benefitted from the use of AI, it also can lead to surveillance with harmful political and economic consequences.

While there are efforts being made in public sector and in not-for-profit spaces, these efforts do not match the investments of the Big Tech companies. If education is taken over by for-profit entities, the intent and means used are unlikely to serve the underprivileged, and may not bring about equity.

Teachers, educational institutions, governments, parents, researchers, all need to come together to seriously consider the ramifications of AI and plot alternatives to ensure that our students are ready to build the future we want ♦

References

1. Harari, Y. (2018). *21 Lessons for the 21st Century*. Jonathan Cape.
2. McCarthy, J. (1979). 'Ascribing mental qualities to machines'. *Philosophical perspectives in artificial intelligence*, ed. M. Ringle. Atlantic Highlands, N.J.: Humanities Press.
3. Wall Street Journal. (2020). 'How China Is Using Artificial Intelligence in Classrooms.' Wall Street Journal, YouTube. <https://www.youtube.com/watch?v=JMLsHI8aV0g&t=11s>
4. Yoo, A. (2020). AI in Education in China. Will it turn students into mindless drones?' *MathGenie*. <https://www.mathgenie.com/blog/ai-in-education-in-china.-will-it-turn-students-into-mindless-drones>

Campus, Corridor and Cyberspace: The Institutional Dynamics of Online Education

Dr Prakrati Bhargava

Abstract

The widespread reliance on online education during the pandemic has raised concerns from different stakeholders in the Indian higher education system (IHES). IHES comprises Institutes of Eminence, central universities, state universities, and affiliated colleges. Central universities have a responsibility of ensuring quality education along with maintaining regional and cultural diversity. However, newer central universities established in the 2010s are struggling with these negotiations due to the local political, social, and cultural climate. The physical space of campuses in higher educational institutions is indispensable when it comes to ensuring democratic values, social justice, and academic freedom. The physical interaction in these spaces nurtures a climate of discussion, debate, and dialogue, which is difficult to realize in online interactions.

The inequality and deprivation of learners in IHES has become grimmer than ever before due to the pandemic and the unprecedented shift to the online mode of education. The differential educational backgrounds and experiences of students who choose central universities not only shape the teaching-learning processes in these spaces, but the university's culture also shapes the imagination and experiences of students. The physical space of the university does not only train students for academic endeavors but also nurtures their political, social, and cultural consciousness. The classrooms and corridors offer time and space for learners to expand their worldviews. Besides this, the physical space also opens the larger world of social networks (social capital) and cultural engagements (cultural capital) through interactions via student unions, cafeterias, hostels, libraries, sports, etc. So, it becomes imperative to ask, how, during the pandemic, did online

interaction shape learners, and who had to credit time, space, and resources (physical and intellectual) from their lives to continue learning?

This paper is based on my experience of teaching and researching in one of the new central universities, the Central University of Himachal Pradesh (CUHP). It seeks to address the following questions: How do students hailing from local colleges perceive academic engagement in a Central university? How did students and teachers experience online interaction during the pandemic?

Keywords: Indian higher education system, online interaction, Central university, cultural capital, social capital, Covid-19

Introduction

Central Universities are regarded as premier institutions of higher learning and research, as well as instruments for mitigating socio-economic and educational backwardness of the region where they are located. Presently, Indian higher education comprises 46 central universities, 371 state public universities, and 304 state private universities (AISHE, 2019). In 2009, 12 central universities were established through the Act of Parliament in those states which did not have any Central university. Although central universities have the mandate to elevate the standards of education, they have become places for satisfying political motives and vested interests (Altbach, 1993). In the backdrop of these universities struggling to maintain good standards of education, the sudden outbreak of Covid-19 and the subsequent shift to online education deprived the students and faculty of the minimal support that they were receiving through physical interactions. This paper seeks to examine the challenges of teaching and learning in the Central University of Himachal Pradesh (CUHP), established in 2010, which is struggling with bare minimum infrastructural facilities. The university does not even have a permanent campus and is functioning out of four rented buildings located 25-50 kilometres from the administrative office.

Himachal Pradesh is a hill state with 89.97% of the population living in villages (Statistical Abstract, 2017-18). Although there is a rapid increase in enrollment, the quality of undergraduate education is dismal.

Higher educational institutions do not merely offer quality education but can also transform the worldviews of students. Most students at Central universities are first-generation entrants, who are disadvantaged as they do not have information about university life, e.g., selection of courses, study organization, and examination preparation (Mishra, 2020). As their parents cannot provide adequate support, social support offered by peers and teachers becomes indispensable. The experience, relationships, and information attained by students in the university plays a decisive role in shaping their career and personality.

This essay is based on the author's observations of students' educational backgrounds and their struggles, gathered over the past nine years as a faculty at CHUP's School of

Education. The essay also attempts to understand the void experienced by students during online education. Physical interactions in university spaces offer enormous resources to students who migrate from their villages to pursue higher education. Besides classroom interactions, the physical space of the university offers resources in the form of social and cultural capital to the students. Bourdieu (1966) points out that the more one interacts with people of different specialties and interests, the more one interacts with their cultural capital and multiplies the opportunities for accessing knowledge. University students with high social capital form better relationship with their teachers and other students (Koultra et al., 2020; Mato & Tsukasaki, 2019; Peng, 2019). Mishra (2020), in her recent study, argues that social networks, social capital, and social support play a significant role in retaining students from minority communities in higher education.

I am aware of my students' socio-economic and educational backgrounds which has helped me in constructing the narratives with respect to their online and offline experiences of higher education. The narrative may not merely depict the struggles of a single cohort of students of one university, but perhaps, provide an indication of the experience of all students who have had to adjust to online and offline classes during the pandemic.

Students' Pedagogic Experience

Every higher educational institution has unique characteristics informed by its geographical location, faculty composition, and students' background. Universities in small towns are significantly different from the universities functioning in big cities like Delhi, Mumbai or Kolkata. CUHP, primarily caters to students from small villages and towns in Himachal Pradesh, who have graduated from local colleges with bare minimum facilities of library, reading materials, and culture of learning. When I enquired from my first-semester postgraduate students who graduated in history or political science, they were unaware of any standard book or even of a reputed scholar in these disciplines. Passing examinations through non-standard reading materials, with minimal interaction with teachers is common. Cultural factors influence the learning pattern of students (Vermunt et al., 2014). Undergraduate instruction in local colleges is heavily dependent on rote learning from sub-standard textbooks exclusively published for cracking exams. Many local colleges hardly have well-equipped libraries with reference books, textbooks, journals, and subscription to e-resources. Lectures and final exams based on reproduction of factual knowledge dominate the higher education system, therefore, students' learning patterns are in tune with this academic culture (Vermunt et al., 2014).

Thus, acquainting students with standard reading materials, including reference books, journals, and articles becomes a tall task. However, after attending classes in a Central university, their academic orientations gradually transform. They experience a significant shift in the pedagogic process. Course content is flexible and open-ended where textbooks are replaced with reference books and journal articles, monologue is replaced by dialogue, paper-pencil tests are supplemented by classroom presentations and term papers. Students

adapt to the new academic culture of the university by engaging in varied academic and extra-academic activities. However, this process was disrupted during the pandemic when education shifted to the online mode.

Online teaching-learning implies a certain kind of pedagogic content knowledge, mainly related to designing and organizing learning experiences with the help of digital technologies (Rapanta et al., 2020). During the second phase of the pandemic (October 2020-February 2021), classes for the new cohort were initiated through the online mode. Physical classroom interaction offers an opportunity for faculty and students to read gestures and expressions of others. Effective teaching demands consistent responses from students that are reflected in their facial expressions. In the virtual mode, students and faculty hardly knew each other, and the students weren't acquainted with the pedagogic culture of the university. The pedagogic process that I practice in the classroom is driven by students' queries and conversations, so the students have to actively participate. During online classes, students initially hesitated to speak, but gradually I made them respond by consistently invoking their responses. But it was a tough job, sometimes due to network problems and sometimes due to personality differences. Moreover, students' personal engagement in home chores and other household responsibilities affected their participation. Coming from humble farming backgrounds, students are often needed in farming and other household activities. Moreover, the availability of reading material was reduced, as CUHP did not offer remote login facility to the library, and students were unfamiliar in exploring scholarly work on the web, and couldn't buy reading materials due to financial constraints. However, the teachers have had to improvise, and through personal guidance, they motivated the students to explore scholarly work on the internet and discuss these readings during online discussions, to build a culture of sharing and reading.

The Missing Peer Group Culture

The vibrant engagement of young minds in higher education institutions forms a social milieu that motivates and inspires students towards mutual learning and engaging in academic activities. Interaction with peers can positively influence overall academic development, knowledge acquisition, analytical and problem-solving skills, and self-esteem of the learner (Kuh et al., 2006). Some students come with commitment and some face difficulty in expressing their views. Students face challenges in adjusting to a new pedagogic environment where English is the medium of instruction, and participation in classroom presentations is influenced by it to a large extent. A cordial relationship, usually facilitated by the physical classroom, not only encourages the students to learn but also to cope with their personal constraints of hesitation and fear. Interactions of students within the classroom and outside creates a conducive environment where students can share their views and problems without hesitation. Beattie and Thiele (2016) state that college students who interact with professors and peers about academic matters have better college outcomes. Hossler, Schmidt, and Vesper (1999) highlight the importance of peer

support in improving the reception of course material and clarifying difficult concepts. In the online mode, peer interaction of the classroom got diffused as they could not read each other's faces, which often elicit responses. Individual differences with respect to personalities significantly shape the dynamics of communication in online classrooms. I have observed the individual differences that affect classroom conversations. Students who were vocal in online classes remained silent in offline class and vice-versa. Moreover, some who face language barriers are more relaxed in the offline class as they can read the face of the teacher and feel comfortable in expressing in their mother tongue. Additionally, the personal engagement of students and passivity (sleepiness, inertness, and inattentiveness) often distort the communication process during online classes.

The Culture Of Discourse

Academic engagement is strengthened by the culture of discourse in which students speak, listen, construct, and tolerate diverse viewpoints. The academic discourse is informed by scholarly reading, thus it is different from idea exchanges that take place among people in general. Students read, comprehend, and discuss their thoughts in the classroom and this motivates them to read more and explore the world of ideas and knowledge. This forms the core of academic engagement in higher education. Students get excited and inspired when they clarify their doubts from other students, or when their views get space in classroom discussions.

In a virtual classroom, this opportunity is significantly restrained. Network problems and other difficulties in the online mode hamper the open interaction among students and teachers. The culture of dialogue and discourse is severely impinged upon. To maintain smooth connectivity during online classes, audio and video of the students are turned off, thus teaching seems like a conversation with a black wall. Mishra (2020) states in his study that students responded negatively when asked if online classes help them to understand conceptual knowledge and academic discourse sufficiently, and they confessed that they were unable to maintain the pace of their learning behaviour or cope with the teachers' speed (Mishra, 2020). Students rightly pointed out that teachers should create an environment for discussion and dialogue by assigning problems to students and eliciting a discussion around that problem.

The Imaginary Of Teacher

Lecturing is the dominating pedagogic practice at the undergraduate level in colleges and universities across India. Students rarely have personal interaction with teachers nor do the teachers have time to address students' concerns. The shift to online mode has distorted even this interaction. While speaking to first-semester postgraduate students enrolled in 2021, they mentioned to me that they hardly had any online classes during their undergraduate studies. Students were confined to their villages during the online classes

with poor internet connectivity and no access to the library. Students had no interaction with their teachers. Personal interaction with the teachers on the one hand motivates students, and on the other hand, it facilitates the teachers to better understand the background of the student, which further assists teachers in selecting their reading materials and simplifying classroom conversations. During the online mode, personal interaction among teachers and students is restrained, and students hesitate to communicate with the teacher. Doubts and misconception are aggravated as the online mode does not give enough space and time for non-formal communication outside the classroom. Besides domain knowledge, proficient computer knowledge, communication skills, and clarity of expression, it has been found that teachers' personal qualities like emotional connection with the students and the ability to resolve small issues during and after the online classes are key determinants for effective teaching. Rapanta and others have identified three distinctive presence of teachers during online instruction. They are cognitive presence, social presence, and facilitatory presence. While cognitive and facilitatory presence points to teachers' understanding of students' preparedness for learning and the availability of digital tools, social presence demands social communication channels that teachers must open to maintain and possibly enhance the lost spontaneous student-student and student-teacher interaction (Rapanta et al., 2020).

Conclusion

Newly-founded central universities have to address the varied educational experiences of the students. However, students' academic exposure in the university brings a significant shift in their worldview. Formal and informal interaction with teachers and peers in the physical space of the university plays a vital role in students' academic progression. However, during the pandemic an unexpected shift to the online mode significantly hampered this process. The physical space of university offers immense resources in the form of social capital (relationship with peers and teachers) and cultural capital (academic and cultural activities, reading material, library and campus space) to students, and helps in overcoming the information and resource limitations that they experience at their homes. The virtual world has undoubtedly erupted information resources, but consistent guidance and mentoring from teachers is irreplaceable under any circumstance ♦

References

1. *All India Survey on Higher Education*. (2019). https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/aishe_eng.pdf
2. Altbach, P. G. (1993). *The dilemma of change in Indian Higher Education - Higher Education*. SpringerLink. <https://link.springer.com/article/10.1007/BF01575104>

3. Beattie, I. R., & Thiele, M. (2016). Connecting in class?: College class size and inequality in academic social capital. *The Journal of Higher Education*, 87(3), pp. 332–362. <https://doi.org/10.1353/jhe.2016.0017>
4. Bourdieu, P., & Richardson, J. G. (1986). Handbook of Theory and Research for the Sociology of Education. *The forms of capital*, 241, p. 258.
5. Department of Economic and Statistics, Government of Himachal Pradesh. (2018). *Statistical Abstract of Himachal Pradesh*. https://himachalservices.nic.in/economics/pdf/StatisticalAbstract_2018_19.pdf
6. Giavrimis, P., & Nikolaou, S. M. (2020). *The Greek university student's social capital during the COVID-19 pandemic*. European Journal of Education Studies. <https://oapub.org/edu/index.php/ejes/article/view/3175>
7. Jha, T. (2015). *The Inception of Banaras Hindu University: Who Was the Founder in the Light of Historical Documents?* Partridge India.
8. Koutra, K., Roy, A. W., & Kokaliari, E. D. (2018). The effect of social capital on non-suicidal self-injury and suicidal behaviors among college students in Greece during the current economic crisis. *International Social Work*, 63(1), pp. 100–112. <https://doi.org/10.1177/0020872818776726>
9. Kuh, G. D., Kinzie, J. L., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature* (Vol. 8). Washington, DC: National Postsecondary Education Cooperative.
10. Mato, M., & Tsukasaki, K. (2017). Factors promoting sense of coherence among university students in urban areas of Japan: Individual-level social capital, self-efficacy, and Mental Health. *Global Health Promotion*, 26 (1), pp. 60–68. <https://doi.org/10.1177/1757975917691925>
11. Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research Open*, 1, 100012. <https://doi.org/10.1016/j.ijedro.2020.100012>
12. Mishra, S. (2020). Social networks, social capital, social support and academic success in Higher Education: A systematic review with a special focus on 'underrepresented' students. *Educational Research Review*, 29, 100307. <https://doi.org/10.1016/j.edurev.2019.100307>
13. Peng, M. Y.-P. (2019). Testing the mediating role of Student Learning Outcomes in the relationship among students' social capital, international mindsets, and Employability. *The Asia-Pacific Education Researcher*, 28(3), pp. 229–237. <https://doi.org/10.1007/s40299-018-00431-3>
14. Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the COVID-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2(3), pp. 923–945. <https://doi.org/10.1007/s42438-020-00155-y>
15. Vermunt, J., Bronkhorst, L. H., & Martínez-Fernández, J. R. (2013). Learning patterns in higher education. <https://doi.org/10.4324/9781315885438>

Economic Realities of Virtual Higher Education in a post-pandemic India*

Dr Binay Kumar Pathak

Abstract

The acceleration of the implementation of 'online' education in the aftermath of the Covid-19 pandemic has now normalized the idea of online schools and universities. This new mode of interaction between teachers and students has wider implications in terms of delivery of services (education); quality of courses, certification, and skills. The market for education can be understood as a monopolistic competition wherein each supplier (school or university) presents their service (education) differently to others. These differences might stem from curriculum, quality of teachers, pedagogy, and mode of certification. With the adoption of online classes, the existing differences have gained new variants in terms of product (service) differentiation according to delivery, pedagogy, curriculum learning outcomes, and certification. These layers of product differentiation go beyond the differentiations of correspondence education, brought about in the late 19th century. While 'online' education started in 1989 with the University of Phoenix establishing a fully online collegiate institution providing undergraduate and postgraduate degrees, the 'online' mode remained supplementary to the regular mode of service delivery. Meanwhile, Massive Open Online Courses (MOOCs) began to appear in 2008, followed by skill enhancement courses of various kinds. These developments have led the already

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hierarchical and differentiated market for higher education towards new milestones in terms of quality and pricing. The availability of courses and diplomas, offered by various platforms and managed by private players in partnership with foreign universities, has added to the existing competition between the classroom-based model and the online model, with the latter gaining popularity.

The traditional classroom-based higher education system has been characterized by 'cost disease' and it is argued that the online avatar will make higher education more affordable in terms of cost of access and supply. Based on a critical review of literature and drawing from a theoretical understanding of higher education as a service and associated peculiarities, this paper seeks to counter the cost-effectiveness claim of online higher education and seeks to establish the 'cost disease' phenomenon with plausible explanations. The paper draws parallels from case studies carried out in the U.S. and presents theoretical underpinnings for understanding the economics of online higher education.

Keywords: cost, pricing, quality, online, differentiation, lag

Introduction

In the backdrop of the information age, we live with a multifaceted existence as our realities keep moving across physical, virtual, and augmented forms. The latest addition to these forms, Metaverse, presents a unified and immersive virtual world, which has been attracting various industries as well as academia. There are reports indicating that universities in the West have started utilizing Metaverse as a platform to enhance the learning experiences of students. Amid such global trends, digital universities and virtual laboratories are being encouraged in the Indian higher education system to promote digital education as envisaged by the National Education Policy (2020). The push towards digital education exemplifies the advantages over space and time as phrases with suffixes 'e', 'online', 'smart', 'digital', and 'virtual' are believed to be the panacea. With the Covid-19 pandemic accelerating the implementation of online education across all stages; debates over the suitability, accessibility, and feasibility of online education garnered the attention of people in general and academia in particular. While the acceleration of online education provides impetus to the growth of EdTech companies, the online mode itself seems to change from being a substitute for the regular or traditional system to a competitor. While a major portion (41%) of growth in the EdTech market lies in the K-12 (school) segment, higher education that's characterized by a wide variety of choices in terms of disciplines, courses, and possibilities viz-a-viz skill enhancement, provides EdTech companies with a wide range to offer their services. As school education and higher education differ significantly in their ways of service delivery, the provision for online services should also be looked into separately. While there exists considerable literature on the economics of online higher education in the context of the U.S., where it emerged and has reached the Metaverse, similar studies for other countries remain scarce. As the area has become more complex and revealing for deeper investigations, an economic approach to present the

developments appears necessary to demystify the claims of advantages of online higher education. This paper seeks to serve this purpose by presenting economic perspectives in three sections – product, cost, and competition. The paper draws arguments from available literature on the economics of online higher education and tries to bring forth economic realities to understand the virtual world of higher education.

Product

The online mode of interaction between teachers and students has immense implications for pedagogy, as well as for the nature and characteristics of the product (education). The market for higher education has always been hierarchical and characterized by product differentiation (a phenomenon in the imperfect market where competing products can be shown to be different from each other with the help of packaging). With the online mode as a new method of delivery of services (education) in place; variants such as course quality, certification, and skill have increased to provide greater product differentiation, as online education has become more segregated and discriminated not only in terms of price but also in quality. Though product differentiation through mode of delivery of education dates back to the late 19th century when correspondence education emerged with the aid of postal services; present differentiations riding on the growth of information and communication technologies (ICT) seem to be competing with the mainstream classroom-based traditional model.¹ While ‘online’ education started in 1989 with the University of Phoenix launching a fully online collegiate institution providing undergraduate and postgraduate degrees, the ‘online’ mode remained supplementary to the regular mode of service delivery. Meanwhile, Massive Open Online Courses (MOOCs) began to appear in 2008, followed by skill enhancement courses of various kinds.² Like the fate of association between correspondence education and the traditional mode, the possibilities of substitutability or supplementary association between the online mode and the traditional one would depend on regulatory provisions, recognition, and acceptability by the society.

Worldwide, higher education institutions (HEIs) appeared to be struggling with the spread of the pandemic. Ewing (2021) traces the challenges HEIs in India, Australia, Thailand, Sri Lanka, Singapore, Bangladesh, New Zealand and Macau are facing, based on interviews with academic leadership from these countries.³ Along with academicians, international agencies such as the OECD, the UNESCO, and the International Association of Universities have also engaged themselves with developments in different countries in the aftermath of Covid-19 and are looking at how universities are responding to the challenges posed

1 The History of Online Schooling: <https://www.onlineschools.org/visual-academy/the-history-of-online-schooling/>

2 A Brief History of MOOCs | MAUT - McGill University: <https://www.mcgill.ca/maut/news-current-affairs/moocs/history>

3 Rethinking Higher Education Post COVID-19: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7869944/>

by the pandemic and ensuing online pedagogy.⁴ The struggle of HEIs depending on fees paid by students for revenue has also increased. These have resulted in retrenchment of teaching staff and voluntary retirement schemes (Australia). While excellence still remains on the top of agenda, at least for above-average HEIs; the struggle for survival amid a global economic downturn is evident. In these circumstances, proliferation of online education adds to the challenges. Even some of the top universities are offering online courses through various platforms. Such ventures might add to the existing popularity of their courses through traditional mode and also allow them to reap the benefits of the online mode. Such a blended mode can again be traced back to the blending of correspondence education with formal classroom education by many universities in India and abroad. The Metaverse is expected to add to these forms of blending with the use of unified and immersive technologies. The idea of substitutability or emerging competition between the traditional classroom-based model and online mode of higher education revolves around affordability in terms of price, space, and time.

Cost And Pricing

The higher education sector in India is characterized by a rising fee-structure that's influenced by a decline in public expenditure on higher education and emergence of private providers. Public HEIs might need to cross-subsidize courses which are lesser in demand from revenues earned (through charging higher fees) from courses which are high in demand. Private HEIs might resort to profiteering through charging higher fees and incurring lesser cost on providing courses. Thus, the efforts of HEIs to cross-subsidize (public) or to profiteer (private), correspond to the cost of production (providing courses or degrees or delivery of higher education) and pricing (fee-structure) of such provisions.⁵ While the cost of production and pricing play an important role for any commodity, higher education as a good has been found to be different from other commodities in terms of production and utility. These peculiarities, discussed in the literature on economics of education, are crucial as they restrict the application of general productivity enhancing principles (as applicable in the manufacturing industry) in the higher education sector. As for illustration, increasing the burden of classes on a teacher or to increase the class size may seem as enhancing productivity but considering the peculiarities of the higher education sector, these can lead to compromise with research outputs of the faculty or deterioration in quality of education for all students. Chattopadhyay (2012) presents a detailed discussion on the nature of higher education as a commodity and the peculiarities of the same market.

4 COVID-19: Higher Education challenges and responses - IAU: <https://www.iau-aiu.net/Covid-19-Higher-Education-challenges-and-responses>

5 Here, the HEIs are presented as firms or producers for the sake of economic understanding of the process. The HEIs as producers produce services that are reflected in terms of courses offered by them. Alternatively, they might also be gauged from degrees earned by students.

Hierarchies exist in higher education as they are demanded for by society. For instance, HEIs at the top maintain supply below the existing demand to keep their prestige intact (Winston, 1999). So, the unmet demand in the higher education sector might not arise only due to lack of supply in structural terms, rather this might be the result of the hierarchy-producing strategy of the sector. Alternate avenues such as distance and open education have existed for many centuries, but these avenues have not replaced the traditional classroom model. The distance and open education systems have adopted technologies as they evolved, such as postal services, television, and internet. But these evolutions along with the adoption of mixed strategies (blended mode of classroom and online learning) by the existing HEIs have not replaced the traditional classroom model. The reason behind this status of the traditional classroom model is the prestige earned by the HEIs and the sense of quality perceived by the students and in the job market. While the cost-advantages of online higher education in the given conditions (as discussed above) might help the sector to remain viable in certain courses, the traditional classroom model illustrated by the range of its product differentiation will stay as long as the quality differential remains significant.

Higher education is a labor-intensive service and the requirement of a high-skilled labor force is one of the prominent reasons for the rise in the cost of higher education (Baumol, 1965; Bowen, 1966). This feature is analogous to the music and performing arts sectors which experience rise in unit labor costs more often than the overall economy. This phenomenon arising out of 'productivity lag' of one factor (labor) with respect to other (capital) is known as 'cost disease'. While Cowen (1996) expresses doubts over this phenomenon citing that innovation in services delivery can reduce cost; Archibald and Feldman (2006) have found conforming results for this phenomenon from their studies on the rising cost of higher education. Similar results were obtained from an economy-wide study by Li (2013) explaining the inability of supply to match the rising demand for higher education due to the existence of the 'cost disease'.⁶ Here, it is to be noted that the increasing cost is not only due to the productivity lag (higher marginal cost) but also due to the bulky nature of capital, leading to a higher average cost for expansion. The two taken together cause a 'supply-lag' with respect to increasing demand for higher education.

As online higher education picked up after 2006 in the U.S. due to ease of regulations, the period also coincides with increased access to internet services and enhancement of internet speed. Marginson (2004) presents the developments in the sector since the 90s and the possibilities for the emerging tech giants of the Asia-pacific. He mentions the booming expectations for online higher education in the 90s and the predictions of the death of brick-and-mortar universities. Most of the discussion on online higher education revolves around the cost-advantage of the model over the traditional one. Even the scholar credited with popularizing the idea of the 'cost-disease' accepted the cost-advantage of online higher education over the traditional classroom model (Bowen, 2012a).

6 Bela Balassa (1964) and Paul Samuelson (1964) in their parallel studies have come across this phenomenon. The insights can be traced back to the works of David Ricardo in the 19th century.

The cost of online higher education can be understood with the help of two terms: average cost and marginal cost.⁷ As online higher education requires more (or specific) capital assets as compared to the traditional classroom, the start-up (average) cost for the former can be higher due to capital assets being expensive and requiring adaptation with time. The requirement for adaptation arises due to the need of compatibility across networked systems, including those owned by students. Thus, online higher education might reduce the cost of labor, but it adds to capital costs as bulk cost remains a feature of equipment/devices and system upgradation (Bapna et al., 2020). The cost advantage is expected from the labor cost (teaching staff) and the ability of reproduction (recordings). While the traditional classroom-based model suffers from 'cost-disease' mostly due to the labor cost, the online model might not address the problem. While the reproduction (recordings) converts education from a service to a commodity, augmented realities (Metaverse and MOOCs) add to the layers of product differentiation (McCowen, 2016; Chattopadhyay, 2020). Therefore, while the online model changes the characteristics of the market for higher education, it does not necessarily lower the average cost.

Online higher education might reap cost advantage in terms of marginal cost approaching zero which would make the service delivery viable at higher scales only (Marginson, 2004; Saltzman, 2014). Operating at a higher scale would require a large strength of students which can only be achieved after a considerable lead time. This might only be possible for skill enhancement courses and professional courses such as data science and management. Otherwise, the start-up (average) cost might be higher depending upon the nature of the institutions and courses. Thus, the considerations of students and the job market play important roles in viability of online higher education. Demand for a product has always been significant in driving the market for the product. However, huge average cost might act as an entry barrier and almost zero marginal cost may lead to rent-seeking (Pathak, 2022). The situation of rent-seeking should be understood as a situation when an economic agent earns without incurring any cost. In such a situation, the existing HEIs would make it extremely difficult for any potential entrant to operate as the entry-level costs would be higher than the marginal cost incurred by the existing HEIs. These tendencies would enhance the monopoly power of the HEIs already at the top. With increasing monopoly power and decreasing competition, the quality of services (higher education) would be compromised.

Competition

As mentioned above, the market for higher education is hierarchical in nature and HEIs compete for inputs (students and staff) as the production is driven by them. Apart from

7 The average cost can be obtained by dividing the total cost by the number of students. The marginal cost refers to the cost of providing education required for the incremental student if we go by adding students one by one. The total cost includes fixed costs and variable costs.

prestige, rank, or quality; the location of the HEI has been found to be one of the important factors for decision-making by students. Online methods with asynchronous and blended learning facilitate choice over space and time. The HEIs with traditional classroom-based models are restricted by their location in attracting students and have a different dynamic arising out of cultural contexts, regulation, and equivalence of degrees (Marginson, 2006). So, with a proposed central digital university and two existing state digital universities, the competition in the online education sector is not limited to only them. Indian HEIs with different ranges of online services would compete with their foreign counterparts and web-based platforms. Foreign HEIs have advantages in terms of lead time and scale as they have the benefit of an early start. These benefits have been extended to the web-based platforms which operate in partnerships with some of the leading universities.

Regulation of the market is expected to be crucial in such situations. With regard to online higher education, the University Grants Commission on one hand promotes MOOCs and SWAYAM – a public platform for MOOCs, but restrains the HEIs in India from collaborating with foreign web-based platforms in offering courses. Moreover, governments seem to be promoting digital universities but have no policy for regulating quality and competition. The policies regarding the regulation of online education lack clarity and foresight. If Indian HEIs are only allowed in later years, they will lose a significant share of the market which will already be in the hands of the foreign HEIs. Here, the intention of the paper is not to advocate the proliferation of online courses with partnerships of Indian HEIs and foreign web-based platforms, but to raise an important issue related to current policy discourse.

Apart from this, there are issues of privacy and intellectual property rights (IPR) involved in the online business of higher education (Bowen, 2012b). Web-based platforms gather a lot of information related to students and might utilize this information along the lines of social media firms. Content creation for online education platforms involves creative labor to make the course content distinguishable. Not only such platforms, the pandemic witnessed a plethora of online content being uploaded on the websites of colleges and universities in the wake of increasing online classes. The issue of IPR has not been adequately looked into this form of content creation. While availability of digital content appears healthy for learning, it seems to undermine the creativity of teachers who put their efforts and struggle for their existence in the competing sector. The issue deserves adequate deliberations and debates.

Conclusion

The affordability of higher education becomes dependent on the purchasing power capacity under the market regime even if the traditional market models cannot be applied to higher education in general. The present scenario of Indian higher education showcases trends for profiteering through privatization. As a matter of fact, few private parties can be philanthropic in nature, but increasing privatization and the policy push for corporatization confirm the tendency of profiteering. Even public HEIs have showcased tendencies to

increase fees. As the fate of the association between open or distance education and the traditional classroom-based model was shaped, the possibilities of substitutability or supplementary association between the two would depend on regulatory provisions, recognition, and acceptability by society at large. With new product qualities, added hierarchical structures, the higher education sector will become more complicated and hard to understand with the help of traditional economic approaches. With huge average cost and almost zero marginal cost, the online market presents entry barriers and rent-seeking tendencies. These might lead to monopolization of the market by few foreign HEIs and render the low-rank domestic HEIs out of market. Such developments would be detrimental for affordability and access. The Indian higher education system appears unprepared for protecting domestic HEIs from foreign competition and regulating quality ♦

References

1. Altindag, D.T., Filiz, E.S., & Tekin, E. (2021). *Is Online Education Working*. Working Paper 29113. NBER Working Paper Series available from <http://www.nber.org/papers/w29113>
2. Archibald, R.B., & Feldman, D.H. (2006). *Explaining increases in Higher Education Costs*. Working Paper No. 42, Department of Economics, College of William and Mary.
3. Archibald, R.B., & Feldman, D.H. (2007, June). *Avoiding Tunnel Vision in the Study of Higher Education Costs*. Working Paper No. 53, Department of Economics, College of William and Mary.
4. Asea, P.K., & Corden, W.M. (1994). The Balassa-Samuelson Model: An Overview. *Review of International Economics*, 2(3). pp. 191-200.
5. Bapna, A., Garg, K., & Mehra, A. (2020). Technology Intervention in Education: Digital Divide and the Aakash Tablet. *Economic and Political Weekly*, 55(10).
6. Baumol, W.J., & Bowen W.G. (1965). On the Performing Arts: The Anatomy of their Economic Problems. *The American Economic Review*, 55(2). pp. 495-502
7. Baumol, W.J., & Bowen, W.G. (1966). *Performing Arts: The Economic Dilemma*. New York: The Twentieth Century Fund.
8. Bowen, W.G., & Brenemen, D. (1993). Student Aid: price discount or Educational Investment. *Brookings Review*, 11. pp. 28-31.

9. Bowen, W.G. (2012a). *Cost and Productivity in Higher Education*. Tanner Lecture I, Stanford University.
10. Bowen, W.G. (2012b). *Prospects for an Online Fix: Can we harness Technology in the Service of our Aspirations?* Tanner Lecture II, Stanford University.
11. Chandrashekhar, C.P., & Ghosh, J. (2020, November 30). *The alarming rise in education costs in New India*. The Hindu Business Line.
12. Chattopadhyay, S. (2012). *Education and Economics: Disciplinary Evolution and Policy Discourse*. New Delhi: Oxford University Press.
13. Chattopadhyay, S. (2020). National Education Policy, 2020: An Uncertain Future for Indian Higher Education. *Economic and Political Weekly*, LV (46). pp. 23-27.
14. Cowen, T. (1996). Why I Do Not Believe in the Cost Disease. *Journal of Cultural Economics*, 20. pp. 207-214.
15. Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P.A., & Lam, S. (2020). Covid-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning and Teaching*.
16. Deming, D.J., Lovenheim, M., & Patterson, R.W. (2016). *The Competitive Effects of Online Education*. Working Paper 22749. NBER Working Paper Series, available from <http://www.nber.org/papers/w22749>
17. Ewing, Lee-Ann. (2021). Rethinking Higher Education Post Covid-19. In Lee, J. and S. H. Han (eds.), *The Future of Service Post-COVID-19 Pandemic*. Vol. 1. The ICT and Evolution of Work. Available from [Rethinking Higher Education Post COVID-19 \(nih.gov\)](https://www.nih.gov)
18. Getz, M., & Siegfried, J.J. (1991). *Cost and Productivity in American Colleges and Universities*. In Clotfelter, Ehrenberg, C.R., Getz, M., & Siegfried, J.J. (eds). *Economic Challenges in Higher Education*. Chicago: Chicago University Press. 261-392.
19. Getz, M., & Siegfried, J.J. (2004). The Sensitivity of Capital Use to Price. *Review of Industrial Organisation*, 24(4). pp. 379-391.
20. Marginson, S. (2004). Don't Leave Me Hanging on the Anglophone: The Potential for Online Distance Higher Education in the Asia-Pacific Region. *Higher Education Quarterly*, 58(2/3). pp. 74-113.
21. Marginson, S. (2006). Dynamics of national and global competition in higher education. *Higher Education*, 52. pp. 1-39.
22. McCowan, T. (2016). Universities and the post-2015 development agenda: an analytical framework. *Higher Education*, 72. pp. 505-523.

23. Li, H. (2013). *The Rising Cost of Higher Education: A Supply and Demand Analysis*. Honors Thesis submitted to the Leonard N. Stern School of Business. New York University.
24. Pathak, B.K. (2022). Economic Implications of MOOCs in Higher Education: An Indian perspective, *WEA Commentaries*, 12(1), 7-9.
25. Winston, G.C. (1999). Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education. *Journal of Economic Perspectives*, 13(1). pp. 13-36.

Bridging the Digital Divide - A Blended Learning Pilot in Odisha

Ms K. Vijayanti

Context

Covid-19 gave rise to multiple challenges across several sectors, everywhere. While the challenges were startling in health and livelihood sectors, education also suffered severely. Unfortunately, the first measure taken by many governments in developing countries was school closure. Many studies indicated that school closures will have a significant negative impact on the learning levels of children, while children with socio-economic disadvantages will be affected more severely (World Bank, 2020). The education landscape changed dramatically with institutions and systems being required to innovate, including adopting e-learning techniques.

India has the largest public schooling system in the world. In the government-school context, many students have limited or no internet access, and many are unable to afford digital devices in their homes. As cited by many studies, online teaching-learning has created a digital divide among students (Pravat Kumar Jena, 2020). Furthermore, the prolonged closure has had a disproportionately negative impact on the most vulnerable students enrolled in public schools. While some studies find that online learning increases retention of information, takes less time, and might be here to stay, impacting education globally, there are serious issues that need to be addressed, starting with access to devices and the internet.

As a response to school closures, Akshara Foundation (AF) designed the Alternative Learning Project¹ (2021), leveraging existing resources within the education system, such as textbooks and workbooks provided by the state government, and government-approved digital content on the DIKSHA² platform. Blending these digital and non-digital resources, AF piloted the ‘Bridging the Digital Divide’ (BTDD) program during the pandemic.

The Pilot

Odisha has around 33,000 government primary schools. The pilot was carried out in five schools located in Mendhashal Gram Panchayat of Bhubaneswar Block (Khordha district). The pilot covered 105 students enrolled in grades 4 and 5 in not just government schools but also in Ashram Schools.³ BTDD was piloted with the aim to support students’ math learning at home. AF provided a device -- a smartphone pre-loaded with math content -- to children and assessed their learning through *Ujjwal* workbooks.⁴ The strategy was to work individually with the selected students and track their learning process during the pilot project period of five months. The students were selected based on their availability during the program period and their parents agreeing to them spending two-three hours daily in a community space.

Program Design

The BTDD curriculum was aligned to the syllabus prescribed by the Odisha government and included existing resources like Energised Textbooks⁵, *Ujjwal* workbooks, and digital content mapped to a Dual Lesson Plan, called so as it consisted of two sets of lesson plans – one, based on the workbooks (physical), and the second, based on the content loaded in the smartphone (digital). The Dual Lesson Plans were developed based on the condensed curriculum guidelines issued by the Centre. (In July 2020, the Central government condensed the syllabus by 30% to accommodate the reduced instruction time due to school closures, and issued guidelines to state governments regarding the same.) The curricular content followed in the program was aligned to the broad principles of math teaching as

1 The Alternative Learning Project 2021, <https://akshara.org.in/wp-content/uploads/Alternative-Learning-Project-report-online.pdf?x52312>

2 DIKSHA is an education resources portal of the Ministry of Education.

3 Schools-cum-hostels run by the Department of ST & SC Development, Minorities and Backward Classes, Odisha. Due to school closures, their students had returned home from schools.

4 *Ujjwal* workbooks are math practice books of the Government of Odisha supplied to government school students of grades 4 and 5. They complement the textbooks with grade-appropriate content for practice.

5 Energized Textbooks refer to physical textbooks containing QR codes which enable access to digital content on various topics <https://diksha.gov.in/help/getting-started/explore-diksha/understanding-qr-code.html>

suggested by the National Curriculum Framework 2005, Position Paper on Mathematics, and the truncated math syllabus and textbooks followed in government schools.

BTDD decided to build its pedagogical strategy – Dual Lesson Plan – based on the workbooks that were already with the students, and the digital content developed by AF during pre-Covid times. The government had provided these workbooks and instructed students to practice math daily when schools were shut. In addition to that, AF envisioned that the digital content it already developed for math learning called Building Blocks, could also be made available through dedicated devices. The mapping of condensed syllabus was carried out on these two existing learning resources, viz, the Ujjwal workbooks and the math digital content. After mapping the syllabus, two sets of lesson plans were designed. The first set that was developed was based on the Ujjwal workbook, and the second was developed by mapping the digital content to the condensed syllabus. The digital content was pre-loaded on the smartphones.

Furthermore, AF designed weekly worksheets containing 10 questions for practice, to engage students in concepts in which they trailed. The worksheets contained problems that were uniquely formulated, based on the syllabus, but not linked to the questions in the textbooks or in Ujjwal. These worksheets enabled students to practice math problems, in addition to what was specified in Ujjwal and the digital content. The volunteers distributed the worksheets to the students every week. The students were expected to solve these worksheets on their own during the daily class held in the community space. They submitted them at the end of the class. The volunteers assessed the worksheets and gave feedback to the students on the subsequent day. The volunteers documented the scores and reported their reflections to the team leader. This process ensured a continuous evaluation of students' learning.

As mentioned earlier, the digital content was provided through Building Blocks⁶, developed by AF, which was already approved and uploaded by the State Council for Educational Research and Training (Odisha) on the DIKSHA platform. Building Blocks provided supplemental opportunities for students to daily practice math at home in a fun way through interactive and gamified digital content. The content is grade-compatible and aligns with the mathematics syllabus and textbook.

The Dual Lesson Plan document consisted lesson plans and the inputs for transaction. In addition to this, a weekly worksheet was developed to engage students with concepts they didn't understand well. The worksheets contained problems not found in either the textbooks or Ujjwal. Each volunteer was provided with the Dual Lesson Plans, worksheets, and the digital content pre-loaded on a smartphone. To ease the day-to-day transactions, a booklet called the Daily Task Guide was developed and given to the volunteers beforehand, to enable them to plan their daily tasks. The team leader's role was to mentor, guide, support, and monitor the volunteers and address pedagogical and implementation challenges.

6 <https://play.google.com/store/apps/details?id=com.akshara.easymath&hl=en&showAllReviews=true>

Implementation

AF appointed a team leader to lead the implementation team comprising nine volunteers from the local community. Though the minimum requirement for volunteers was for them to have completed grade 12, some were post-graduates, while others had diplomas in education. Each volunteer engaged a defined cohort of students in a designated community space.

BTDD began a continuous capacity-building program with a five-day interactive session that included content on the impact of Covid-19 on learning, uncertainties of school re-opening, and adherence to Covid-19 protocols. Key components of the program included daily routines, pre-loading digital content, math teaching for grades 4 and 5, review of workbooks, follow-ups with students individually on conceptual understanding of math, and obtaining feedback. This session was delivered by AF's resource team. The volunteers took sessions for two hours daily from Monday to Saturday.

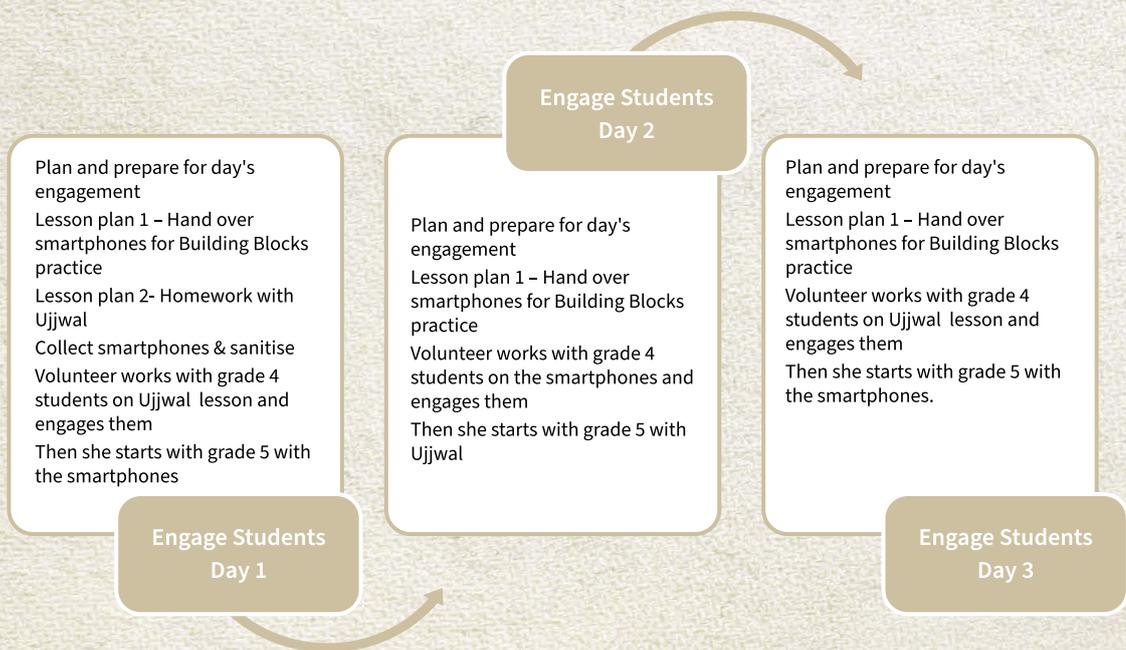
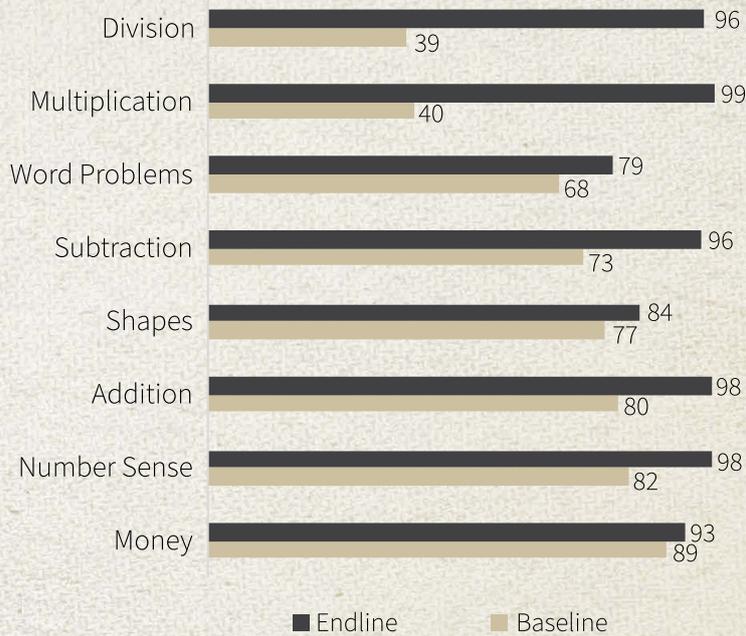


Fig. 1: Daily engagement with children

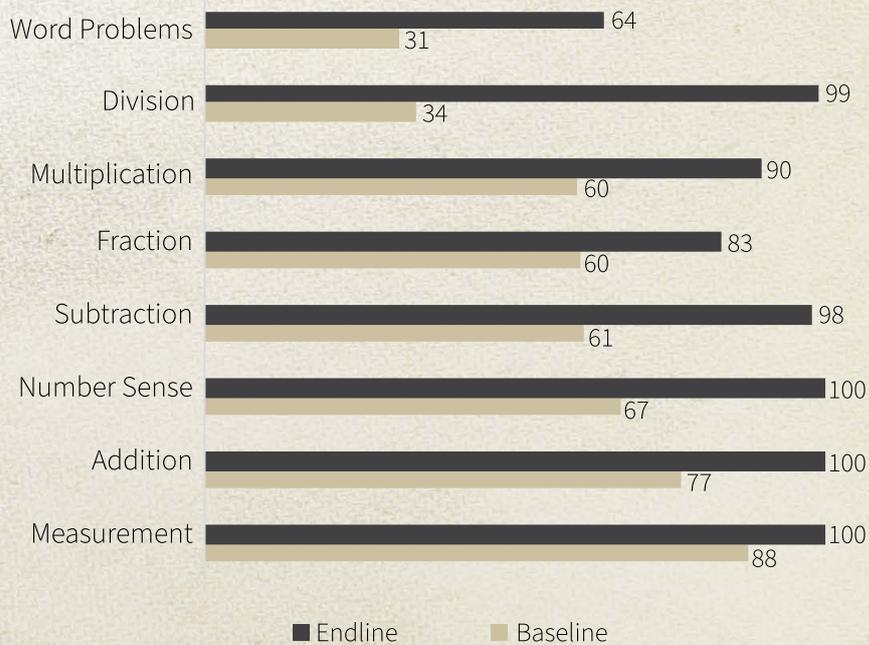
Grade 4 Average Scores

N = 57 (in%)



Grade 5 Average Scores

N = 48 (in%)



Pedagogical Process

A Dual Lesson Plan Handbook was developed by AF, which provided lessons covering various concepts with weekly timelines, so that the volunteer would know exactly which concept she/he had to deliver week after week.



Fig. 2: working with the app

Volunteers prepared themselves before a class, by making daily plans, pre-loading the content suggested by the weekly plan, reviewing the Ujjwal component that the students would be guided to do on that day, and solving the problems provided in the workbook and textbook. The volunteers consulted AF's math resource team if they faced any challenges regarding pedagogy and noted suggestions. The timings of the class depended on the volunteer and the village where it was held. All volunteers took classes for two hours from Monday to Saturday. Volunteers followed the weekly timetable given below. They also followed safety guidelines like masking, sanitizing the devices and their hands, apart from other protocols.

Weekly Routine

1. Day 1: Gather all the selected students in a designated community space, like a temple or a Gram Panchayat community hall. Assign worksheets from Ujjwal to all the grade 4 students. Meanwhile, engage grade 5 students with smartphones and guide them to practice with Building Blocks with games linked to the particular lesson plan. At the end, collect all the phones and sanitize them.
2. Day 2: Repeat the same process reversing the Dual Lesson Plan activities. Worksheets from Ujjwal assigned to grade 5 students and engage grade 4 students with smartphones to work on Building Blocks-related lesson plan.
3. Distribute worksheets related to lessons/concepts covered during the week on Saturday.
4. The same process was repeated throughout the month. Sunday was a holiday.
5. Volunteers made notes at the end of each day to review the session and follow up with children the next day.

Reflection And Planning

Every fortnight there was a day-long interaction session, during which the volunteers exchanged experiences, took stock of their learning, clarified doubts, charted their progress, and were given the work plan for the subsequent fortnight.

Learning Gains

As many as 57 grade 4 students and 48 grade 5 students (total 105 students) were assessed by the volunteers through a baseline conducted in January 2021 and an endline conducted in April 2021 to measure learning outcomes. The grade 4 tests were based on grade 3 competencies and grade 5 tests on grade 4 competencies. The blueprint of the question paper was based on the competencies and micro-competencies specified by the National Council for Educational Research and Training for grade 3 and grade 4 students. The content of the questions differed from baseline to endline. However, the blueprint and rubrics remained the same. The test was to identify if students had acquired the language and math skills of the grade below their current level, and could read and comprehend the instructions given in the question paper. The written test had 15 questions. As per the High

Distribution of students by score bands				
Score Bands	Grade 4		Grade 5	
	Baseline	Endline	Baseline	Endline
First Division 60%+	79 (45)	100 (57)	60 (29)	100 (48)
Second Division 45-59%	16 (9)	0	31 (15)	0 (0)
Third Division 33-44%	5 (3)	0	4 (2)	0 (0)
Below 32%	0	0	4 (2)	0 (0)
Total No. of Students	100 (57)	100 (57)	100 (48)	100 (48)

Figures in parentheses are the absolute number of students

School Certificate Examination (HSCE) Odisha⁷, students are required to score 33% to pass the exam. An analysis was carried out based on the HSCE criteria.

The table above, shows that at the time of the baseline, more than 75% of grade 4 students (45 out of 57) and 60% of grade 5 students (29 out of 48) had secured First Division. Less than 5% of the students scored 100 out of 100 in the baseline test, an indicator of them retaining their learning levels of the previous grade. The endline found that all students had moved to the First Division bracket. However, a drill-down analysis gave an idea about the micro-concepts in which the students had acquired skills and those in which they were having difficulties. A competency-wise analysis of grades 4 and 5 students was carried out to see the scores gained across the competencies.

At the time of the baseline, many students were struggling with problems related to multiplication, division and word problems. Though there was substantial improvement with regards to word problems and fractions towards endline, students were struggling with some basic competencies that they should have acquired in the previous grades.

Challenges

BTDD had to negotiate with the government and the local community to get approvals from the Education and Social Development departments and the Gram Panchayat. Finding a

⁷ HSCE is a qualifying criterion conducted by the Board of Secondary Education Odisha <http://www.bseodisha.nic.in/?q=node/42%27%3B>

learning space acceptable to all the stakeholders was another challenge. From the academic perspective, the challenge was what to include and what to skip. As math requires a spiral pedagogy, the program based on condensed curriculum had to be designed carefully. Motivating local female volunteers with an education background was a task, which was resolved when the Gram Panchayat got involved in sourcing volunteers. One of the major challenges was to get children back to the learning track as students had forgotten what was taught, and engaging their attention was difficult.

During implementation, sticking to the prescribed lesson plan was a challenge for volunteers due to varying learning levels of the students. However, as they intensively engaged with the students, it increased bonding and enhanced understanding of value of the program, thus resolving this issue. This meant that volunteers were spending more time than what had been planned. Lastly, the students and volunteers faced technology issues such as unresponsive digital content including navigation and gadget-related issues. To scale the program, the government needs to invest in procuring more devices, which may be a challenge along with buy-in from the teachers on the new teaching-learning strategy.

Concluding Observations

The Covid-19 outbreak effectively led to the closure of over 1.5 million schools, affecting 286 million children from pre-primary to secondary levels, around the world. As many research studies have pointed out, the learning loss with regards to language and math will affect the education system severely, unless some emergency measures are taken to resolve this.

The pedagogical strategy, process, and learning gains of the BTDD pilot indicate that the blended model could be the way forward, engaging children in a meaningful learning environment. The model focused on processes and possibilities in mathematics education, which could be adapted to other subjects as well. There is a need to design programs and catching-up strategies to enable children to recover what has been lost during the last two academic years and bring them back to expected levels of learning. Once schools reopen, pre-loaded digital content and teachers working individually with students at their pace could be the strategies necessary for children to learn. While digital solutions are thought of as a way forward, in reality, the digital divide has resulted in pushing students without digital facilities to a greater disadvantage. Needless to say, that rural children are more susceptible to marginalization than most others. It is in this context that AF designed and implement the blended learning model that had innovation at its core.

This essay concludes that AF's journey with its pilot during the pandemic proved that the concept of blended learning could be made to work with investment plans on provisioning the digital device and building the capacity of teachers. The blended learning program could be implemented as a strategy to help students continue learning with digital content at home after physical schooling hours ◆

References

1. Bank, W. (2020, May 7). *The COVID-19 pandemic*. Open Knowledge Repository. <https://openknowledge.worldbank.org/handle/10986/33696>
2. Jena, P. K. (2020). Impact of covid-19 on Higher Education in India. *International Journal of Current Research*. <https://doi.org/10.31235/osf.io/jg8fr>
3. Planning and Convergence Department, Government of Odisha. (n.d.). *Odisha Economic Survey 2018-19*. https://pc.odisha.gov.in/sites/default/files/2020-03/Economic_Survey_2018-19_0.pdf
4. Save the Children. (2021, September 19). *The Paused Classrooms*. Education Emergency. <https://educationemergency.net/2021/09/the-paused-classrooms-research-report-orissa-rte-forum-and-save-the-children/>

Looming Crisis of the Pandemic: Forlorn State of Education with Exacerbating Inequalities

Ms T. S. Kavita Rajeshwari

Abstract

The much-awaited Right to Education act passed in 2009 to ensure compulsory education for all kids aged 6 -14 years seems to have completely lost its essence post-pandemic. Concerns about its four essential components, namely availability, accessibility, acceptability, and adaptability to provide an equitable education are lost, and economically weaker sections are further being pushed to the periphery. In light of these events, this paper attempts to understand the benefits and drawbacks of online education and the core issues of online education from primary stakeholders, namely, teachers and students across different school levels. The paper finds that as schools moved to online education through digital mediums in the absence of alternatives, the digital divide has exacerbated the existing rift between the haves and have-nots and the gender bias in education. There have been numerous initiatives like E-platforms, door-to-door distribution of study materials, and provisions for providing digital devices, but only to a limited extent. India is certainly not prepared to embrace the mass shift to the online school education system until the broader issue of the digital divide in the country is addressed. As students return to school this year, there is a need to recognize and address the learning loss of students, especially the vulnerable groups, during school closures induced by the pandemic.

Keywords: Online education, COVID -19, School education, Digital access

Introduction

COVID-19 pandemic has transpired global economies into an unimaginable forlorn state, reportedly the worst multifaceted crisis since the second world war (BBC, 2020). Coronavirus has raised alarming questions about our preparedness to combat epidemics and neglect of lessons we ought to have learned from previous pandemics of the 20th century such as the Asian flu in 1957, the infectious pandemic witnessed in the 21st century including the severe acute respiratory syndrome or ‘SARS’ in 2002 and the N1H1 or ‘Bird flu’ in 2009 (Baldwin and Mauro, 2020). Distanced social relations, loss of income, migration, and school closures experienced will have a long-lasting impact on school learners.

There may be divergent discourses on what the future portends, however online learning or virtual classes is what schools in different countries will tend to adopt during school closures. Thus, it is essential to understand the effectiveness of online education. In light of these questions, the paper attempts to understand the core issues of online education from the perspectives of primary stakeholders, namely, teachers and students across different school levels. The paper also attempts to evaluate if the Indian economy is prepared to embrace this broad shift in our school education system and extend digital education to all learners.

History Of Online Education

The history of Online learning dates back to the 19th century when it was first introduced in the form of distance learning at the University of Chicago. Technological advancement led to an exploration of alternative mediums of education like the radio in the 1920s. Television in the 1950s opened room for virtual instructions, especially to reach out to learners who were unable to attend face to face classes during wartime or due to schedule conflicts and accessibility issues (Mclsaac & Gunawardena, 1996). The first online course for credit, using computers and emails, was introduced by the Ontario Institute for Studies in Education, University of Toronto in 1984 (Bates, 2019). Online learning got an exponential thrust with the advent of the World Wide Web in 1991, and not only online credit courses but entire degree programs are being offered online (Sun & Chen, 2016). MIT initiated free online courses through its ‘OpenCourseWare’ project in 2003 and Massive Open Online Courses (MOOCs) started in 2007 with the creation of Advance Learning Interactive Systems Online (ALISON). Online education providers have expanded from universities, colleges, and K-12 schools to private education initiatives like edX, Khan Academy, Coursera, MOOC, Minerva, Udemy, TEDx, and MITx among others.

Arguments For Online Education

According to the distance learning expert, Thomas L Russell, “... No matter how it is produced, how it is delivered, whether or not it is interactive, low-tech, or high-tech, students

learn equally well with each technology and learn as well as their on-campus face-to-face counterparts”, however, this argument is widely contested in academic scholarship which asserts that online education can supplement but not replace offline education. Developing a curriculum for e-learning that promotes active learning using digital technology in their daily learning activities has also gained international support as it supports acquiring 21st century skills. Repetto & Spitler (2014) established online education as a connecting conduit between “current concerns” and “learning objectives” for at-risk learners. Success depends on the instructor–learner engagement and course design that suffices triangular need of academics, social and behavioral interventions. It is argued that virtual classes provide flexibility in location and time (Thomson, 2010). Other potential benefits are increased efficiency with less traffic, parking issues, pollution, and time taken to travel to schools; reduction in the cost of school-based facilities; salary cost; realizing economies of scale by reuse of study resources; broadening access in remote locations with low enrolment rates and engages learners in active learning (Thomson, 2010; Bakia, Shear et al., 2012).

Online education is also observed as a learner-centric platform that paves the way for them to take up courses of their choice at their self-guided pace as per their educational needs (Brittany, 2015).

Arguments Against Online Education

Disturbing emerging issues and concerns of online education encircling the students during times of pandemic are increased violence at home, safety concerns, sexual abuse, neglect, lack of access to school-provided facilities like mid-day meals, absence of counseling sessions, online protection threats, social skills, ostracization, discrimination, denial of opportunities in lack of digital resources, the likelihood of girls not returning to school and rise in adolescent pregnancy (Viner et al., 2020). Studies have reported an increase in anxiety and stress among students and parents. Parents struggle to arrange devices and support their younger children with classes and assignments while working from home. The challenge is more so for parents with more than a single child to arrange digital devices to attend online classes (Jessen and Waights, 2020). Other major worries concern teachers and students from non-English mediums due to very less content available in languages other than English.

An empirical evaluation of publicly available data of ten states on distance learning’s effectiveness in the K–12 setting by Harris & Ségol (2015) states that the performance of online schools is not homogenous. Another study performed to investigate the relationship between students’ perception of interaction, and the blended learning environment observes that (a) students believed student-teacher interactions is vital for their learning experiences (b) students were moderately satisfied with blended learning (c) students’ personality is a key factor influencing the level of interaction and satisfaction gained from attending the course. Extroverts are more satisfied and interactive than introverts in such settings. (Kuo, Belland et al., 2014).

Pandemic Induced Online School Education In India

School closures in 162 countries have impacted the education of more than 1.2 billion children, approximately 70% of the global enrolled student population (UNESCO, 2020). In India, since the second week of March 2020, a phase-wise lockdown started in different parts of the country to contain the spread of coronavirus as a public health mandate. In the last week of March 2020, schools were closed nationwide, at a crucial time when students were appearing for their annual examinations.

From physical classrooms, schools then moved to the virtual classroom using platforms like MS Teams, Google Meet, Skype, WhatsApp, and YouTube which served as the connecting links between students and schools. The Central government encouraged the use of platforms like ePathshala, Swayam, and 'T.V. classroom' Swayam Prabha. State governments and union governments undertook digital initiatives; e.g. Delhi government launched online classes for mathematics in collaboration with Khan Academy, Kerala used T.V. classrooms and an e-portal, and the UP government began online courses through WhatsApp groups, Tamil Nadu conducted bridge courses on Kalvi TV. However, it is feared that these initiatives may not have reached many students. According to the [National Sample Survey report on education \(2017-18\)](#), only 24% of households in India have internet facilities, and only 8% of households with members aged between 5-24 years have a computer with an internet connection. According to government estimates, around 60% of India's student population is enrolled in government schools, and around 43.5% of them have no access to smartphones.

Even those students who have been attending online school are facing varied difficulties. Given an average student-teacher ratio of 30:1 or higher in most schools, it is difficult for the teachers to gauge each student's understanding. The study used google forms for an online survey to understand the experience of teachers and students with online learning. (Please refer to the end of the paper to access the google forms and the detailed results generated from the study). The results of the study showed that most students preferred physical education over online education. The most prominent reasons for the respondents for preference toward physical education were poor network connectivity, power issues, decrease in interaction with teachers, distractions caused by social media, discomfort like headache and tiredness due to increased screen time, and the time lag to receiving feedback on submitted assignments.

Additionally, few teachers remarked that face-to-face classroom sessions in a traditional classroom setting better facilitated a student-centered approach and observed the need to devise pedagogies to reach specially-abled students better. Some teachers were satisfied with the mode of teaching as it allows students to continue learning and can write their doubts and get them clarified anytime. Many others expressed dissatisfaction with online education due to the inability to discern students' understanding, difficulties in evaluation, and reduced freedom and flexibility in teaching due to interruptions by students' guardians during classroom sessions.

Key Issues Concerning Indian School Education Post-Pandemic

Around 250 million students in India were adversely affected by the government-mandated school closures during the pandemic. With around 40% of India's population of 1.38 billion under 18 years, impaired access to education has multitudes of repercussions, the effects of which will be long felt. This section attempts to examine the differential impact of the pandemic on the learners to apprise us of the critical areas to focus on policymaking for school education post-pandemic. The Pandemic impacted all students, but the impact was amplified for the vulnerable groups. Students from lower-income deciles dropped out of private schools, some transferred to public schools while others had to take up odd jobs to support their families in times of income loss and pandemic-related deaths of family members. Government schools, especially in the rural areas struggled to transition to distance education from the traditional mode of teaching. Pandemic may have multiplied the dropout rates, especially for girls leaving them at the peril of attending to domestic chores, care responsibilities, early marriage, and even trafficking.

In contrast to the formal schooling system, the online coaching industry mushroomed during the absence of in-person teacher-pupil interactions. According to a study published by Boston Consulting Group in collaboration with Teach for India in January 2022, the impact of school closures extended much beyond learning, including a rise in malnourishment, lack of academic discipline, and an increase in exploitation and emotional issues for children. Pratham, a non-profit organization, conducted a household-level telephonic survey to understand the transition in the education system when schools are reopening after almost 18 months. The report stated that the young children were the most affected as non-enrolment was the highest for children below five years. Approximately 35.9% of children in classes one and two have had no classroom experience. Teachers interviewed in the survey echoed the same concern as they elaborated on how difficult it is to make these young children sit in the class first, let alone basic reading and writing alphabets and numbers. A sample survey conducted in Karnataka showed that there has been a steep decline in children's foundation skills, specifically for lower primary classes.

Further, the negative impact of the pandemic was multiplied for children with disabilities, children of migrant workers, refugees, and asylum seekers. As per government estimates, the country experienced a mass internal migration of around 10 million migrant workers, who were employed as daily wage workers due to loss of livelihoods in urban areas. This led to a significant percentage of school dropouts. A Principal in a Delhi government school recounted that it was particularly difficult for them to trace the children of migrant workers. Many children have taken up menial tasks to support their family members during the pandemic. In an interview, teachers at a government school in Tamil Nadu have noted that it is difficult to bring back drop-out students and rekindle their interest in studies.

Dropouts and learning losses posed by school closures are likely to continue or even be aggravated as children return to school if the curriculum design and lesson plans do not

consider the differential learning losses due to school closures. It is, therefore, essential to assess the basic literacy levels, language, and math to identify the learning gaps and plan remedial strategies for the children before beginning with the respective grade level. It is equally crucial to recognize and address the basic foundational skills for early grades. Large scale standardized efforts are required to ensure the emotional well-being of the children. Assessments should be creative including role play, games, quizzes, discussions, and presentations to encourage the cognitive, social, and critical thinking skills of the students rather than the rudimentary pen and paper format. It is time that we reset our education system to blend the learnings of the past and the technology of the present to fix the bridge from education to employment. Pandemic amidst all its drawbacks has shown us teachers and students are quick to adapt to technology and also brought to light the large digital divide that needs correction if sincerely we intend to transform our education system to make it more relevant to meet the demands of the 21st century.

Conclusion

For millions of learners, the reopening of physical classrooms brought back the hope of interpersonal interaction, exchange of ideas, access to mid-day meal schemes, and freedom from the burden of household responsibilities. Centre and state governments certainly need to work on the following key aspects among others to build an inclusive education system: Identification and provision of training requirements for teachers; find ways to strengthen Anganwadi and Midday meal schemes; identify displaced migrants and enrolling their children back to schools in their areas; develop a mechanism to control dropout rates and gender disparity; support with pedagogical practices to meet the diverse needs of specially-abled students. This paper appreciates the steps taken up by the education departments, but they are ineffective if access issues are not timely addressed. Several initiatives like e-learning platforms in local languages, AI enriched digital apps, door-to-door supply of study materials, and provision of digital devices by state-governments, local bodies, NGOs, and local communities have been taken up to ensure undisturbed learning. However, the reach of such initiatives is very low, considering India homes 320 million learners. The learning loss of the students is a critical issue that needs to be addressed while developing curriculum and lesson outcomes for different grades. Assessment and teaching should be conducted at the right level, especially for vulnerable groups. Pandemic showed that teachers are quick to adapt to technology and highlighted the need for professional development to support the changing role of teachers. The biggest challenges for continued learning during school closures were power, device and data affordability, and network connectivity infrastructure. These challenges should be actively addressed by the government, not just during the response planning, to make sure that all children have equitable access to e-learning ♦

Demographic information of the survey respondents

Total Respondents	128
Response surveys with missing values	4
Remaining final response survey count	124

Age statistics

Class interval (Age in years)	Upper bin	Frequency
20 - 30	30	14
30 - 40	40	53
40 - 50	50	28
50 - 60	60	26
60 - 70	70	2
70 and above	More	1
		124

Gender distribution

Gender	Frequency	% distribution
Male	23	19
Female	101	81
	124	

Rural/ Urban statistics	Frequency	% distribution
Rural	33	27
Urban	91	73
	124	

Mode of teaching after COVID-19 lockdown	Frequency	% distribution
Fully online (You interact with students in real time eg. Online conference, Chat room etc.)	33	27
Partially online (You communicate to the students with a time lag through email, Whatsapp etc.)	91	73
Not taking classes	124	

References

1. Bakia, M., Shear, L., Toyama, Y., & Lassetter, A. (2012). *Understanding the Implications of Online Learning for Educational Productivity*. Office of Educational Technology, US Department of Education.
2. Baldwin, R., & Di Mauro, B. W. (2020). *Economics in the time of COVID-19: A new eBook*. VOX CEPR Policy Portal.
3. Baruah, S. (2021, May 9). *Delhi: With teachers on Covid duty and no online classes, schools lose touch with students*. The Indian Express. Retrieved June 29, 2022, from <https://indianexpress.com/article/cities/delhi/delhi-with-teachers-on-covid-duty-and-no-online-classes-schools-lose-touch-with-students-7308419/>
4. Bates, T. (2016, February 15). *Celebrating the 30th anniversary of the first fully online course: Tony Bates*. Tony Bates . Retrieved June 29, 2022, from <https://www.tonybates.ca/2016/01/17/celebrating-the-30th-anniversary-of-the-first-fully-online-course/>
5. Bose, P. R. (2020, May 10). *The Covid Challenge to Indian School Education: Reform or perish*. The Hindu BusinessLine. Retrieved June 29, 2022, from <https://www.>

thehindubusinessline.com/news/education/the-covid-challenge-to-indian-school-education-reform-or-perish/article31551911.ece

6. Braun, V. & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A.T. Panter, D. Rindskopf, & K. J. Sher (Eds), *APA handbook of research methods in psychology, Vol. 2: Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57-71). Washington, DC: American Psychological Association.
7. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
8. Gilbert, B. (2015). *Online learning revealing the benefits and challenges*.
9. *Covid-19 pandemic most challenging crisis since Second World War: Unchief*. The Economic Times. (2020). Retrieved June 29, 2022, from <https://economictimes.indiatimes.com/news/international/world-news/covid-19-pandemic-most-challenging-crisis-since-second-world-war-un-chief/articleshow/74923642.cms?from=mdr>
10. Desk. (2021, April 15). *Challenges for teachers which never existed before*. India Today. Retrieved June 29, 2022, from <https://www.indiatoday.in/education-today/featurephilia/story/challenges-for-teachers-which-never-existed-before-1790931-2021-04-14>
11. Desk. (2021, May 10). *How students can deal with Covid-19 fatigue?* India Today. Retrieved June 29, 2022, from <https://www.indiatoday.in/education-today/featurephilia/story/challenges-in-indian-education-system-due-to-covid-19-pandemic-1800822-2021-05-10>
12. *Education minister holds meet on Board Examination: Chennai News - Times of India*. The Times of India. (2021, May 11). Retrieved June 29, 2022, from <https://timesofindia.indiatimes.com/city/chennai/education-minister-holds-meet-on-board-examination/articleshow/82541257.cms>
13. Harris-Packer, J. D., & Ségol, G. (2015). An empirical evaluation of distance learning's effectiveness in the K-12 setting. *American Journal of Distance Education*. 29(1), 4-17. DOI:10.1080/08923647.2015.990768
14. *Immunise school education against Covid disruption*. The Financial Express. (2021, April 17). Retrieved June 29, 2022, from <https://www.financialexpress.com/opinion/immunise-school-education-against-covid-disruption/2234779/>
15. *India Needs To Learn- Schooling in a Post-Pandemic World*. (2022) Retrieved 29 June 2022, from <https://asiasociety.org/india/events/india-needs-learn-schooling-post-pandemic-world>
16. Iftikhar, F. (2021, November 19). *Education: How the pandemic has left young*

children vulnerable. Hindustan Times. Retrieved June 29, 2022, from <https://www.hindustantimes.com/india-news/education-how-the-pandemic-has-left-young-children-vulnerable-101637311207509.html>

17. Jessen, J., & Waights, S. (2020, April 14). *Covid-19 day care centre closures and parental time use*. CEPR Policy Portal. Retrieved June 29, 2022, from <https://voxeu.org/article/covid-19-day-care-centre-closures-and-parental-time-use#:~:text=Effects%20of%20COVID%2D19%20day,time%20use%3A%20Evidence%20from%20Germany&text=The%20COVID%2D19%20outbreak%20has,increase%20in%20child%20care%20responsibilities>
18. Kirpal, V. (2021, May 8). *A possible game-changer*. The Hindu. Retrieved June 29, 2022, from <https://www.thehindu.com/education/how-e-learning-can-be-a-game-changer-in-india/article34513394.ece>
19. Krishnan, K. (2020, April 13). *Our education system is losing relevance. Here's how to unleash its potential*. World Economic Forum. Retrieved June 29, 2022, from <https://www.weforum.org/agenda/2020/04/our-education-system-is-losing-relevance-heres-how-to-update-it>
20. Kuo, Y-C., Belland, B. R., Schroder, K. E. E., & Walker, A. E. (2014). K-12 teachers' perceptions of and their satisfaction with interaction type in blended learning environments. *Distance Education*, 35(3).
21. Kundu, P. (2020, May 5). *Indian Education can't go online – only 8% of homes with young members have computer with net link*. Scroll.in. Retrieved June 29, 2022, from <https://scroll.in/article/960939/indian-education-cant-go-online-only-8-of-homes-with-school-children-have-computer-with-net-link>
22. Mclsaac, M. S., & Gunawardena, C. N. (1996). Distance education. *Handbook of research for educational communications and technology*, 403-437.
23. Pratham. (2021). *Annual Status of Education Report*. New Delhi: ASER Centre. Retrieved from <http://img.asercentre.org/docs/aser2021forweb.pdf>
24. Repetto, J. B., & Spitler, C. J. (2014). Research on at-risk learners in K-12 online learning. In R. E. Ferdig & K. Kennedy (Eds.), *Handbook of Research on K-12 Online and Blended Learning* (pp. 107-134). Retrieved February 13, 2016, from http://press.etc.cmu.edu/files/Handbook-BlendedLearning_Ferdig-Kennedy-etal_web.pdf
25. Russell, T.L. (1999). *The no significant difference phenomenon*. Raleigh: North Carolina State University
26. Saleem, S. M. (2020). Modified Kuppuswamy socioeconomic scale updated for the year 2020. *Indian Journal of Forensic and Community Medicine*, 7(1), 1-3.

27. Sharma, K., Grewal, K., Sadam, R., Sikander, Z. S., & -Singh, A. (2021, April 19). *That feeling of loss: What school year 2020 has been like for students of class 10 & 12*. ThePrint. Retrieved June 29, 2022, from <https://theprint.in/india/education/that-feeling-of-loss-what-school-year-2020-has-been-like-for-students-of-class-10-12/640948>
28. Shekhar, D. J. (2021, April 19). *Beating Bharat's edtech blues: When you're poor in the Digital Education Era*. Forbes India. Retrieved June 29, 2022, from <https://www.forbesindia.com/article/edtech-special/beating-bharats-edtech-blues-when-youre-poor-in-the-digital-education-era/67517/1>
29. StraighterLine. (2015, June 17). *A brief history of online learning* <https://www.straighterline.com/blog/brief-history-online-learning-infographic/>
30. Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15, 157-190.
31. Thomson, L. D. (2010). Beyond the Classroom Walls: Teachers' and Students' Perspectives on How Online Learning Can Meet the Needs of Gifted Students. *Journal of Advanced Academics*, 21(4), 662-712. <http://joa.sagepub.com.pluma.sjfc.edu/content/21/4/662.full.pdf+html>
32. UNICEF. (2021). *India Case Study*. United Nations Children's Fund (UNICEF) and United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021.
33. Viner, Russell M, Simon J Russell, Helen Croker, Jessica Packer, Joseph Ward, Claire Stansfield, Oliver Mytton, Chris Bonell and Robert Booy. 2020. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child & Adolescent Health*.

Learning in the Lockdown: Perspectives from a JJ cluster in Delhi

Ms Bhuvaneshwari Subramanian

Introduction

No single event in recent history has been as unanticipated, calamitous, and overwhelming in terms of the devastation and disruption it has caused in almost all spheres of life all over the world, as the Covid-19 pandemic. Almost no industry, sector, or sphere of life has remained untouched by Covid-19, especially because of the lengthy 'lockdowns' imposed by different local and national governments. In this context, education in India has been one of the most crucial and significant domains that first experienced a near-complete standstill, and has since been undergoing a massive reorientation with technology emerging as the driving force behind a reimagination of what education looks like. While this has given a huge boost to various education-technology (ed-tech) related businesses, it has also laid bare the huge inequalities India faces in terms of access to technology and education.

Even before the March 2020 Covid-19 induced lockdown, education was far from being a level playing field. Education in India is characterized by sharp inequalities, and at the same time, it has also provided a context for deeply contested debates regarding the meaning and purpose of education itself, which includes questions such as who should deliver it, what should be offered as content, and what is the relationship between education and society. There is also a crucial need to focus on the education of the marginalized and socially vulnerable groups in India, along with a need to understand how the learning experiences of children are shaped by the larger structural and organizational factors. Further, as urban populations continue to rise in India and the world, along with the increasing concentration of poverty in urban areas, it becomes important to understand the perspectives of those

living in urban poverty in order to fully understand the context surrounding education for socio-economically marginalized populations.

In this regard, Delhi offers itself as an ideal site for the study of the various questions related to the shaping of education for the urban poor. Delhi is one of the largest cities in India with a population of more than 167 lakhs (Census, 2011) and according to data collated from the 69th round of the National Sample Survey, approximately 10.2 lakh households live in areas that are designated as ‘slums’ within the urban areas of Delhi (Directorate of Economics & Statistics, 2015). Further, Delhi has witnessed a sudden and sustained increase in government expenditure and involvement in education since the year 2015. It is thus relevant to understand whether this increased expenditure has percolated down to the socially and economically marginalized sections of the population. Moreover, understanding the perspective of those living in urban poverty becomes even more essential in the current scenario where physical schools have been closed for almost two years and almost all educational processes have shifted online.

With this in mind, the current study focuses on a *Jhuggi Jhopri* (JJ) Cluster in East Delhi. One of the objectives of the study has been to understand the impact of the Covid-19 induced school closure in terms of the schooling experiences of those living in urban poverty. The study also explores how far systems of online learning reach the lowest levels of social and economic hierarchies.

Online Classes

Since the start of the Covid-19 pandemic, India has witnessed one of the longest school closures across the world (Murali & Maiorano, 2021). In fact, in Delhi, the closing of all educational institutions was announced on 12, March 2020, almost two weeks before the first nationwide lockdown was announced on 25, March 2020. While the strict nationwide lockdown started to be eased after a period of two months, schools, especially for classes 1-8 remained closed for over one and a half years and were only reopened in November 2021.

With such a prolonged period of school closure, schools across the city and the country shifted to an online mode of education. However, the term ‘online classes’ has meant very different things for students living in urban poverty, depending on the class they study in and the kind of school they attend. In the JJ cluster where this study is based, the different schools attended by students included primary schools run by the East Delhi Municipal Corporation (EDMC), secondary schools run by the Delhi Government, “elite” government schools such as Kendriya Vidyalaya and the Delhi Government’s School of Excellence (which has now been converted into School of Specialized Excellence), and some private schools.

For most of the students studying in classes one to eight in government schools, the parents stated that no online classes involving any kind of video interaction were held.

For these students, online education simply meant being a part of WhatsApp groups for different subjects and getting daily or weekly worksheets. Students were expected to solve these worksheets and send back pictures of the solved worksheets to their teachers through WhatsApp. However, the situation was found to be somewhat different for those studying in government schools such as the Delhi Government's flagship School of Excellence or the Kendriya Vidyalaya run by the Central Government. The children from the JJ cluster attending these schools had regular online classes with video interactions with their teachers and classmates, along with getting regular worksheets. This was also the case with children studying in private schools. During our interactions, a parent of a child studying in a neighboring private school under the EWS/DG (Economically Weaker Section/ Disadvantaged Group) category recounted that regular online classes were held with attendance being marked in every class for every child. The parent also stated that the teachers were concerned about every child attending classes and would inquire in detail if their child missed even a single class. There was, thus, found to be a very clear distinction between the kind of classes held for children in different schools.

However, across the board, all the parents that were interviewed unanimously agreed that studying at home was not adequate for their children. Even though many parents were uneducated themselves, they could tell that their children had suffered significant learning losses over the last two years. Moreover, though their children had been promoted to higher classes at the end of the academic year, the parents believed that their children had not actually learned much during the period of school closure.

Even those parents whose children had regular video interactions and classes stated that their children often copied the answers to their worksheets from one another, or older children solved them for their younger siblings and friends. Even when tests and exams were conducted, parents stated that children did not take them seriously and asked their parents or friends for help and rarely solved them on their own. Overall, all the parents that were interviewed stated that schooling provided a regular schedule for children and kept them busy the whole day with regular homework, assessments, and exams. Studying from home, even for those having regular video classes, was far from adequate as children got distracted easily and hardly spent any time on focused studying.

Such findings not only throw light on the actual experience of online education for those living in urban poverty but also help to explain the data that has been reported in other studies on the learning experiences of children during the pandemic. One such study is the SCHOOL (School Children's Online and Offline Learning) Survey 2021, conducted across underprivileged households in urban and rural areas in India. The survey reported that in urban areas, where people are generally assumed to be better connected with technological facilities, the percentage of surveyed children studying online regularly was only 24%. Those not studying at all were 19% and the percentage of parents who felt that their child's reading abilities had declined was as high as 76%. The report also points out that the extended school closure has effectively created a four year learning deficit in many children as those who were in Class 3 when schools were closed, are now in Class 5 but with the reading ability of students in Class 1 (The SCHOOL Team, 2021).

Along with alarming declines in reading and writing abilities, other reports have pointed out that there has also been a substantial increase in the number of dropouts among those belonging to disadvantaged communities, with the number of children being out of school increasing significantly in the younger age groups (Murali & Maiorano, 2021). Thus, a stark contrast is visible between children from privileged households who have continued their education smoothly through the online mode, and those from underprivileged households who have been struggling to access online education.

Access To Digital Technology

Access to digital technologies is a crucial dimension of online education. For all forms of online education, from WhatsApp groups to video lectures through videoconferencing platforms, the digital infrastructure that can support these technologies is a prerequisite. Such digital infrastructure includes a stable electricity connection, devices such as smartphones, laptops, or personal computers, and ongoing access to internet services. Moreover, access to the digital technologies associated with online education also requires the ability to navigate through various digital interfaces, a difficult process for the uneducated or first time users of such technologies. Though urban areas are generally thought to have better technological facilities, the reach of such facilities to poor and marginalized groups leaves much to be desired.

In the JJ cluster in question, most of the interviewed households stated that they had only one smartphone. Most families could also not afford to buy more than one smartphone which caused problems where households have many school-going children in different classes, who require the phone at the same time. Households that already had a smartphone before the lockdown reported that the phone was used by the working adult (usually the father). Hence, it was available for the children to attend online classes only after he returned home from work. Children could thus access the study materials sent on the phone only in the evening or night. Even where schools were undertaking online, video-based classes, such issues made it difficult for students to actually attend these.

Many households reported that they had to spend on smartphones, internet connectivity, and on frequent repairs to these devices, despite suffering unemployment and income loss at the same time. Even though at least one smartphone was available in all the interviewed households, very few children could attend online, video-based classes regularly, and most children had to be content with sending and receiving worksheets through WhatsApp.

These findings provide a glimpse of the poor access to digital technology, reported from across the country. According to the 75th round of the National Sample Survey (NSS) for 2017-18, from the Ministry of Statistics and Programme Implementation (MOSPI), only 24% Indians owned a smartphone and only 11% households possessed any digital device such as laptops, desktops, tablets, palmtops, or such handheld devices (MOSPI, 2018). The report also states that only 8% households having children aged 5-24 years had a computer with internet connectivity.

Thus, the level of access to digital technologies was already extremely low before the start of the Covid-19 pandemic, in households with children enrolled in schools or colleges. Given this, the complete shift of education to an online mode has exacerbated the educational inequalities in our country. Those belonging to economically and socially disadvantaged communities have had to bear the brunt of prolonged school closures, as they are the ones who have mostly remained cut-off from any meaningful teaching-learning activities for almost two years.

Conclusion

Apart from the direct impact on the health and livelihoods of individuals, the pandemic has seriously affected the education sector as well. With India having one of the longest periods of school closures across the world, students and teachers have had to learn the intricacies of online education almost overnight. While this process has been fraught with problems everywhere, it is those living in marginalized communities that have invariably got the rawest deal.

The interviews conducted among households in a JJ cluster in East Delhi reveal that there are large variations in the kind of education available to students under the label of 'online classes'. While those better resourced private, State, and Central Government schools have had regular video-based classes, those in municipal primary schools and other government schools have received only WhatsApp based worksheets for almost two years. However, all parents interviewed, felt that their children had lost crucial years of their education because of school closures.

School closures have starkly revealed the digital divide that already existed in the country. The digital divide has caused the deepening of existing educational inequalities as those belonging to economically and socially disadvantaged communities that have the least access to digital technologies such as phones, computers, and the internet, and have received a raw deal in the name of online education.

It is also important to consider that most parents in urban slums and JJ clusters of Delhi are not educated, hence their children are highly dependent on schools for their formal education. Under such circumstances, school closures have caused significant learning losses for these children, as the experience of online education has been severely limited for them. Further, given the recurrence of various waves of the pandemic, which then cause recurrent school closures, it is vitally important for policy makers to rethink the current model of online education in order to make it more inclusive and to ensure that no child is left behind. It is also important to consider the extent of school closure and assess its risks vis-a-vis the harms of school closure.

The 21st century is witnessing continuous technological advancements, and it is not surprising that technological solutions are being sought for problems in all sectors, including

education. However, as ed-tech companies grow and new forms of online education emerge, it is critical to consider the experiences of children from socio-economically disadvantaged communities. For these children, even after two years of online education, there remain serious deficits in terms of access to digital technologies and infrastructure, and actual learning through online modes of education ♦

References

1. Census 2011 India (2011). *Population census 2011*. <https://www.census2011.co.in/>
2. Directorate of Economics & Statistics. (2015). *Urban Slums of Delhi*. Government of National Capital Territory of Delhi. New Delhi. Retrieved from <http://www.im4change.org/docs/402Urban%20slums%20in%20Delhi.pdf>
3. National Statistical Office. (2019). *Key Indicators of Household Social Consumption on Education*. Ministry of Statistics & Program Implementation, Government of India.
4. Murali, V. S. & Maiorano, D. (2021). *Education during the COVID-19 Pandemic in India*. ISAS Working Papers: Long-term studies on trends and issues in South Asia. Institute of South Asian Studies, National University of Singapore. Retrieved from https://www.isas.nus.edu.sg/papers/education-during-the-covid-19-pandemic-in-india/#_ftn41
5. Bakhla N, Drèze J, Paikra V, and Khara R. (2021). *Locked Out: Emergency report on School Education*. The School Children's Online and Offline Learning (SCHOOL) Team.

Bringing the Real World into Online Learning: Teacher Notes From an Online, Fun Chemistry Course

Dr Ajita Deshmukh

Abstract

As teaching-learning processes transitioned into remote learning due to the Covid-19 pandemic, there were several out-of-formal-class measures that were undertaken by many government and non-government institutions. Different experiments were conducted to make the most of remote learning by merging formal and informal learning, as well as exploring alternative pedagogical approaches.

This paper documents the strategies implemented, and the fun activities incorporated in one such experiment, an online course conducted for 8-11-year-olds, where they were taught chemistry through active learning and game-based pedagogies. This paper, derived from the field notes taken during the course, observes the participants' engagement in the course and outlines the strategies adopted for blending the virtual and real worlds.

Keywords: integration of offline activities, blended learning, alternative pedagogy, art integrated science, activity-based pedagogy

Introduction

Covid-19 caused drastic changes around the world. Educational institutions have had to remodel their teaching practices. In many parts of the country, the use of 'Emergency Remote Teaching' (ERT) technologies, solely based on the understanding of the teachers and institutions without any specific training, led to chaos. ERT included passing notes over WhatsApp, replication of traditional teaching practices in physical spaces with the only change being the online medium of delivery, among other things. Furthermore, in many institutions, there was no ERT at all, due to several factors.

Since March 2020, many students have been subjected to long screen-time as they started attending online classes. A popular media in such synchronous classes was the video, typically, a passive resource for educational transactions, which increased the screen-time duration. Large part of teaching-learning happened with information being transferred from the teacher, with students' microphones and videos being muted. Such practices can lead to a false notion that online teaching-learning is ineffective. However, it is contended that integrating online and offline learning experiences can lead to effective learning. The crux is in designing learning experiences that integrate online teaching with offline household experiences to help construct knowledge. This paper elaborates the design of such an integrated program, and discusses the involvement and engagement of students.

Literature Review

Research on pandemic-enforced remote teaching has revealed that the wellbeing of students is effected due to stress and lack of social connect (Calao, et al., 2020). It is also accepted that social and emotional connect is largely due to the 'fun' element of social activities in the physical classroom. ERT missed the 'having fun together' element due to physical distancing requirements. Specialty devised and adapted games can help in inducing the fun element even in virtual classrooms. A number of studies have been conducted on game-based learning (GBL), a constructed activity that includes elements of game mechanics into non-game settings (Brown, et al., 2019; Lengyel, 2020). GBL arouses curiosity, competitive spirit, and creativity to establish and construct concepts (Boyle, 2011), and enrich learning experiences of students in higher education (Campos, et al., 2020). GBL is reported to have increased learning outcomes (Wardoyo, DwiSatrio, & Ma'ruf, 2020), and impacted the development of 21st century skills (Qian & Clark, 2016; Al Fatta, Maksom, & Zakaria, 2019). GBL has been implemented in multiple settings, including in training and education, as well as through social media (Pho & Dinscore, 2015). GBL provides opportunities to enhance critical thinking, reasoning, and problem-solving skills to enhance specific learning goals and outcomes, increasing productivity in technical and engineering students (Talib, et al., 2019).

Methods and Processes

A. The Course

The course aimed to teach fundamentals of Chemistry in a ‘fun’ way, and was designed for the 8-11 age group. The topics included learning about metals, metalloids, and non-metals; their properties; uses; and the periodic table. The course was offered for a period of one week, daily, for one hour in the evening. In order to maximize attention and participation, all the (roughly) 120 students who enrolled from across India, were split into three batches of 35 students each. This was also in line with RTE norms of pupil-teacher ratio (PTR) of 30 for primary classes. The instructors, timings, support team, platform, and course curriculum was consistent across all three batches.

B. Course Design and Active Learning

Active learning strategies were the pedagogic foundation of the course, videos were consciously avoided. Activities were designed in a game-based manner (individual and group), which required the students to collect material that’s easily available in their immediate surroundings.

The games were designed considering popular games like Housie and Scavenger Hunt, and modified as required, for online purposes. Each game allowed students to construct their knowledge of chemistry. After the completion of the activities, each participant shared their understandings, and the instructors facilitated their learning by clearing their misconceptions. The participants were allowed to use paper-pen as well as ICT tools, but this course did not involve training the participants on the ICT tools.

A few of these games can be accessed [here](#).

Observations

The instructors and the course team members were observant of the interactions and participation of each student. Field notes were maintained in a google document, so that each member could note their observations, and it could be used to solve any technical, implementation, or academic issues.

C. Course Design and Delivery

It is essential to consider the limitations of material availability at students’ end in a hybrid/flexible pedagogy setup, especially one that focuses on ‘active learning’ strategies. It calls for deep thinking in design. A dedicated extra half an hour – the ‘zero hour’ at the beginning of the course was used to tackle technical difficulties or any other difficulties related to the course faced by the young learners. As a strategy, the students were informed beforehand that they would have to introduce themselves by talking about their hobbies,

other activities, a recent book that they read, etc., which would help them get to know each other. Their general interests and reading interests ranged from astronomy to science and art. This half an hour allowed them to know a bit about each other, which helped in the formation of teams and, generally, supported interactions. It was observed that the children were well aware of the mechanics of online interaction. In case there were multiple hands raised, or two children unmuted and speaking at the same time, they would pause and give each other the chance, or rely on us to take the call on who speaks first. No child 'bulldozed' other children. This indicates that that this generation (belonging to the specific socio-economic background of children who enrolled) is used to social interactions over the virtual space.

D. Active Learning

During Scavenger Hunt, children had to fetch things made of a certain element in a fixed time. The clues were given not by directly naming the element, but by mentioning its properties. Most of the children could fetch articles within the time limit fixed for the activity. It was noted that the students were very calm and mostly were able to find things in proximity. When the children had to fetch articles made of aluminum, it was noticed that children got back packs of medicines like Crocin/Dolo. This proved to be a striking reminder of the grim pandemic times that we all were in the midst of. The objects that the children fetched were used for a discussion on classification of elements.

The story of Mendeleev's periodic table was shared in the form of a comic book using the 'share screen' feature, followed by discussions. The session dealt with the conceptual shift from atomic weight to atomic number, and from Mendeleev's periodic table to the Modern periodic table, concluding with its popular representation.



Fig. 1. The housie ticket with instructions and example

Most children knew how to play Housie, and were able to create housie tickets at their end as per the given instructions. The game was designed as edutainment, where the clues for the 'housie elements' were given in terms of properties of the elements in order to reinforce

their learning about the elements within the context of the periodic table. The Housie game was played for three criteria: the quick five, completed row, and full house. Participants would have to ‘raise their hand’, if they completed a criteria, switch on the camera and show us their Housie ticket. The ticket would then be verified by the course team and the winner of the round would be announced.

The collaborative strategy game, ‘Sink My Ship’, was far more immersive as reported by the students. The participants had to work together in teams that were randomly assigned, with one objective of ‘sinking the ship’ of the instructor on the basis of their knowledge of elements and periodic table. The ‘ship’ would be an element symbol displayed on the screen. The teams worked in cohesion to add up and use their elements efficiently to sink the instructor’s ship without any confusion or conflict. The course team monitored and tracked the participants. Correct answers to puzzles and quizzes were totalled to declare winners. There was no observable difference in the participation of male and female students in this course.

E. Assessments

Since the course was based on ‘fun-learning’, it was imperative that the assessment also incorporated the fun element. The assessments were distributed throughout the course for better engagement. These games were used as formative assessments with a focus on ‘assessment for learning’, so as to construct knowledge – the basis of science education.

The summative (end-of-course) assessment was designed to integrate art and science to allow the students to creatively express themselves, a quality often found to be high in this age group. For the final assessment, children had to draw/trace a superhero – could be existing, adapted, or a newly-created superhero – and assign specific properties of various elements to their superhero. There was no restriction on the medium of their creation. They were asked to submit their creations in pdf/video format, either over email or via WhatsApp to the course team members. The course team members helped the students with technical aspects and other doubts encountered during the entire assessment.

Limitations Of The Study

Since enrolment into the course was voluntary, the intrinsic motivation of students was high, and this led to the smooth conduct and eventual success of the course. Whether the same outcome is attained in a compulsory course would require further research. The other limitation was that the enrolled students in this course had the basic technological competencies to participate in an online course. Implementating such fun-learning pedagogy for other age groups, including for students in higher classes and for other subjects and disciplines, would require further research. Another important limitation was the availability of devices to conduct the course online, although as these games are originally played in in-person environments and are adapted for online environments, these methods are amenable to in-person learning as well.

6. Summary And Conclusions

To overcome the persistent challenges of student engagement and motivation in online, offline, or hybrid modes of learning, it is advantageous for educators to implement fun-learning and/or game-based learning. Research indicates that experimentation and personal experience is important to the process of learning. The course provided multiple opportunities for students to experience things in a fun-learning way. Teachers should, therefore, look at strengthening their professional competencies in this area. Novel pedagogical strategies will have to be explored, implemented, and documented by educators at various levels of formal education, with an aim to have learner-centric educational transactions that can be adapted for remote and hybrid learning. Student wellbeing is the critical part of a successful pedagogy, and teachers have to make conscious effort towards the same.

In conclusion, given the reality of the virtual and the physical worlds merging and blending into a stabilized hybrid, this paper outlines strategic steps that could be taken in order to successfully implement fun-learning in the virtual mode ♦

References

1. Colao, A., Piscitelli, P., Pulimeno, M., Colazzo, S., Miani, A., & Giannini, S. (2020). *Rethinking the role of the school after COVID-19*. *Lancet Public Health* 2020, 5, p. 370.
2. Boyle, S. (2011, October). *An Introduction to Games based learning*. UCD Dublin. <https://www.ucd.ie/t4cms/UCDILT0044.pdf.pdf>
3. Brown, C, L., Comunale, M. A., Wigdahl, B., & Urdaneta-Hartmann, S. (2018). *Current climate for digital game-based learning of science in further and higher education*. *FEMS Microbiology Letters*, 365(21), p. 237. <https://doi.org/10.1093/femsle/fny237>
4. Campos, N., Nogal, M., Caliz, C., & Juan, A. A. (2020). *Simulation-based education involving online and oncampus models in different European universities*. *International Journal of Educational Technology in Higher Education*, 17(1), pp. 1-15.
5. Al Fatta, H., Maksom, Z., & Zakaria, M. H. (2019). *Game-based learning and gamification: Searching for definitions*. *International Journal of Simulation: Systems, Science & Technology*, 19, 10-5013.
6. Lengyel, P. S. (2020). *Can the game-based learning come? Virtual classroom in higher education of 21st century*. *International Journal of Emerging Technologies in Learning*, 15(2). <https://doi.org/10.3991/ijet.v15i02.11521>

7. Qian, M., & Clark, K. (2016). *Game-based Learning and 21st century skills: A review of recent research*. *Computers in Human Behavior*, 63, pp. 50-58.
8. Pho, A., & Dinscore, A. (2015). *Game-based learning*. *Tips and Trends*. <https://acrl.ala.org/IS/wpcontent/uploads/2014/05/spring2015.pdf>
9. Sardone, N. (2018). *Attitudes toward game adoption: Preservice teachers consider game-based teaching and learning*. *International Journal of Game-Based Learning*, 8(3), pp. 1-14. <https://doi.org/10.4018/IJGBL.2018070101>
10. Talib, C. A., Aliyu, F., bin Abdul Malik, A. M., & Siang, K. H. (2019). *Enhancing students' reasoning skills in engineering and technology through game-based learning*. *International Journal of Emerging Technologies in Learning*, 14(24), pp. 69-80. <https://doi.org/10.3991/ijet.v14i24.12117>
11. Vlachopoulos, D., & Makri, A. (2017). *The effect of games and simulations on higher education: a systematic literature review*. *International Journal of Educational Technology in Higher Education*, 14(1), pp. 1-33. <https://doi.org/10.1186/s41239-017-0062-1>
12. Wardoyo, C., DwiSatrio, Y., & Ma'ruf, D. (2020). Effectiveness of game-based learning-learning in modern education. In G. Agustin (Ed.) *3rd International Research Conference on Economics and Business* (pp. 81- 87). *KnE Social Sciences*. <https://doi.org/10.18502/kss.v4i7.6844>

Online Education during Pandemic: Challenges in Indian Higher Education

Ms Disha Sharma

Abstract

This article aims to analyze the implications of unplanned online education in Indian higher education. It discusses the systemic inequalities that surfaced in universities due to the pandemic. The article refers to secondary sources such as research articles, government reports, and newspaper articles to analyze how online education has, perhaps, created more challenges than benefits. It also analyzes how online education has led to creating a further knowledge divide because of the existing digital divide in India. The article focuses on the challenges faced by university students during the pandemic.

Keywords: Online education, higher education, digital divide, knowledge divide, Covid-19 pandemic, marginalization

Introduction

Covid-19 has been damaging for almost everyone across the globe. Yet, it has been more destructive for some than for others. As the global pandemic spread, all educational institutions were immediately and completely shut down. While this immediate shutting down was considered an important step for safety, it produced a sudden and unplanned reliance on online education. In this mass shift to online education, digital inequality was

not taken into consideration. Due to the digital infrastructure gap, there was an automatic invisibilization of many university students, especially from marginalized groups.

Nevertheless, this invisibilization is not new in the Indian scenario. There is a history of discrimination in India and in the Indian higher education system where students have been excluded based on structural inequalities. It is crucial to inquire - What role does online education play in inclusion and exclusion? Can universities democratically provide online education? This article draws on secondary sources to understand the challenges of Indian university students, during the pandemic. More than answers, this article explores some pertinent questions which require further exploration.

Higher Education Before Pandemic

This section provides a brief background of Indian higher education focusing on university students. It depicts the crises of public universities before the occurrence of Covid-19. This section explores the question: Are university students facing challenges only because of the pandemic? To give a brief context, I mainly engage with the works of Apoorvanand and Avijit Pathak.

Apoorvanand, in his book, *The Idea of a University*, discusses the issue of nationalism which is driven by Hindu domination. This kind of nationalism targets universities as its enemies and accuses them of holding secular, liberal, and critical ideologies that are pictured as opposing Hindu nationalism. This puts universities in a position of constantly proving their nationalist credentials to justify their usefulness to the nation. Analyzing hegemonic nationalism in relation to public universities, Avijit Pathak argues that such a notion of nationalism depicts the ideological state apparatus of the state, which asks universities to conform to hyper-nationalism and not ask questions in order to be safe. (Apoorvanand, 2018; Pathak, 2021)

Avijit Pathak further argues that religious nationalism represses alternative voices often coming from the student community. These alternative voices question the hegemonic nature of nationalism. The market-oriented technology-based education, and religious nationalism become suspicious of the critical perspectives emanating from liberal education. The interrogations by the alternative voices are seen as a threat by dominant ideologies because it questions their power position. This threat is reflected in attacking and calling university students anti-national. (Pathak, 2019)

Online education has been favored even before the pandemic. Importance has been given to ICTs and MOOCs where universities naturalize the idea of online education and misappropriate the concept of democratic access. With the rise of e-learning spaces, surveillance can be applied in the garb of 'recording' classes, and such recorded lectures would be seen as the source of 'knowledge'. This managerial and surveillance-based idea of education depicts a diminishing role of public universities in India (Arunima, 2017).

The above discussion gives a glimpse of the higher education scenario, Indian higher education has been facing problems even before the pandemic occurred. It can be seen that universities in India are already in a difficult situation because of the influence of the dominant ideologies that see universities as the problem. The challenges that the pandemic brings do not situate themselves on a clean slate but on already existing problematic situations. Additionally, it is not with the pandemic that online education has been favored but it has been favored before as well. To make better sense of this situation, the next session discusses the higher education scenario during the pandemic.

Higher Education During Pandemic

This section examines the challenges faced by university students during the pandemic. The sudden and unplanned transition of educational space from the physical classroom to the online classroom raises the question: What is the aim of education? Scholars claim that the sudden and sole reliance on online education hints at the commercialization, marketization and privatization of education, where the focus is solely on transacting education. In such a case, online education becomes a commodity that has to be transacted by the producer (teachers) with the buyer (students).

In this scenario, students from disadvantaged backgrounds find it difficult to afford internet connectivity, get access to smartphones or laptops and face difficulty in engaging in online education. The pressure of not being able to participate in online classes has led to a rise in suicides. Koshy (2020) notes that approximately 2.5 lakh students in Kerala do not have access to TV, or smartphones and are not able to join online classes. Students who are deprived of access to online education mostly belong to marginalized communities.

This is reflected in The Mobile Gender Gap Report 2019, where it is depicted that there is a global gender gap in owning a mobile and accessing the internet. The highest gap is witnessed in the Global South, whereas compared to men, women are 28% and 58% less likely to own a mobile and access the mobile internet, respectively. India reports 26% and 56% respectively.

Saumyajit Bhattacharya (2020), in *What Is So Wrong with Online Teaching?* articulates that the availability of the internet does not directly translate to access to education. It has to be considered that a mobile is not an ideal device for online lectures as its screen is small, and using it for longer durations can be more harmful than beneficial. Also, the mobile or a laptop may be unavailable for the required duration if there is more than one student at home, or if the device owner needs it.

Such an analysis questions the very nature of knowledge production through the virtual mode of education. The online mode of education creates a digital divide which causes a knowledge divide (Shah, 2020). The knowledge divide highlights the challenges of accessibility and equity in online education. The knowledge divide surfaces the problem

of asymmetry of access and exclusivity in pedagogy, where only a few students can access online education. Secondly, it is important to ask whether students who access online education are able to have critical engagements. The politics of the pandemic which affected the world disproportionately, exercises similar inequity through online education.

Furthermore, patriarchal structures produce an added disadvantage on women, requiring them to be the caretakers in the house. The globalized world gives utmost importance to productivity, denying women the space to breathe. They are supposed to juggle their responsibilities in the house along with their education. As the university campuses and classrooms have virtually entered their homes, there is no sense of a divide between private and public life. The university space which earlier allowed female students to be away from domestic constraints has now entered the domestic space. Even though there is a promise that education can give an equal space for students to learn and grow, it was challenged during the pandemic. The equality that a university campus provided (the extent of this equality is questionable), has visibly reduced in the virtual version of the university. The intensity of the situation has to be understood in the context of increased gender-based violence during the pandemic where women are supposed to live with their abusers (Anureet, 2020; Bhattacharya, 2020). The pandemic has overburdened female students and has disproportionately affected them. The gendered dimensions of technical advancements do not guarantee fair access to knowledge. Thus, it leads to creating new forms of 'othering' in education for women. It is not to say that these 'otherings' were not present before, but they have become more prominent now with the closure of physical university spaces.

The universities created a complete dependence on online education by closing campuses without considering the status of students from different socio-economic backgrounds. It seemed that universities visualized the student community as a homogeneous category that is privileged. The voices, in forms of newspaper reports, complaints in university email chains, etc, coming from the margins were silenced and ignored. However, this act of silencing and not hearing alternative voices is not new. Such violence is a function of a hegemonic, Hindu nationalist, and market-oriented university where students are attacked. It is difficult to imagine democratic education from exclusionary education spaces. In this context, perhaps, instead of trying to continue education, educational practices such as exams and online classes could have been halted. When the pandemic attacked the whole world, students had to sit for exams and attend online classes.

Assumptions About University Students

All the above-discussed articulations reflect that universities seem to implicitly have made certain assumptions to ask everyone to go online suddenly. One assumption seems to be that the student community is homogeneous. It also seems that the universities assume that home is a safe space without any violence and with ample privacy where students can freely study. The universities also assume that all students can access online education

equally with a good internet connection, and study online material for long hours without disruptions. The universities also assume that students do not contribute to household chores, and they don't take into how account how being engaged in household work could deprive them of the required time and space to pay attention to online classes and exams. Such assumptions depoliticize the nature of online education. These assumptions reflect how universities are turning their back on complexities such as caste, class, and gender issues of students.

Limitations

This article does not focus minutely on different marginalized groups and include their experiences of the pandemic and online education. It does not discuss what different roles the university undertook during the pandemic and how they shaped the experiences and aspirations of the university students. It does not address the experiences of teachers who also faced challenges during this shift to online education. Further research can explore the experiences of different stakeholders such as teachers, parents or guardians and administration. Further research can focus on policy implications and analyze the policy shifts in education, in general, and online education, in particular.

Concluding Remarks

It can be concluded that this article raises questions about the role of universities in India during the pandemic period. This article analyzes the implications of the sudden shutting down of universities and complete reliance on online education. It is observed that complete and sudden reliance on online education has benefited some but drastically affected many university students, particularly students from marginalized communities. There have been pre-existing inequalities and challenges in higher education, and the pandemic has exacerbated them. Universities were already struggling with the attacks of privatization and hegemonic nationalism. The pandemic created new layers of challenges of access and equity in university spaces. The structural inequalities of the universities have been brought to the surface with the emergence of the pandemic. There has been rampant exclusion due to a lack of digital infrastructure. Thus, online education cannot be seen as a better alternative to physical classroom spaces. Instead of online education, no education could have been opted for the time being. If not that, then atleast online exams and assessments could have been stopped or postponed as it seems unethical and insensitive to ask students to sit for exams when the whole world is dealing with the pandemic. It seems that online education has not been successful in implementing inclusion and equality in Indian higher education. However, it can be used as a support tool along with physical classrooms. As times are changing, student and teacher experiences must be taken into account before continuing with the total reliance on online education ♦

References

1. Anureet. (2020, September 23). *How online education is widening the gender gap thanks to connectivity issues*. SheThePeople TV. <https://www.shethepeople.tv/home-top-video/how-online-education-india-widened-the-gender-gap-thanks-to-connectivity-issues/>
2. Apoorvanand. (2018). Introduction. In Apoorvanand (Ed.), *The Idea of a University*. Oxford.
3. Arunima, G. (2017). *Thought, policies and politics: How may we imagine the public*. <https://www.jstor.org/stable/44646202>
4. Bhattacharya, S. (2020, December 24). *What is so wrong with online teaching?* Economic and Political Weekly. <https://www.epw.in/journal/2020/23/commentary/what-so-wrong-online-teaching.html>
5. Koshy, S. M. (2020, June 2). *Unable to join online classes, Kerala Schoolgirl commits suicide: Cops*. NDTV.com. <https://www.ndtv.com/india-news/coronavirus-kerala-girl-cant-attend-online-classes-amid-lockdown-commits-suicide-2239318>
6. Pathak, A. (2019, November 20). *The threat to the idea of a public university*. Return to frontpage. <https://www.thehindu.com/opinion/op-ed/the-threat-to-the-idea-of-a-public-university/article30019537.ece>
7. Pathak, A. (2021, February 27). *In classrooms, we need to rediscover meanings of 'disobedience', 'nationalism'*. The Indian Express. <https://indianexpress.com/article/opinion/columns/sedition-charges-firs-anti-national-nationalism-7206570>
8. Shah, K. (2020, December 23). *Online teaching during covid-19*. Economic and Political Weekly. <https://www.epw.in/journal/2020/21/letters/online-teaching-during-covid-19.html>
9. *The Mobile Gender Gap Report 2019*. GSMA. (2019). <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/02/GSMA-The-Mobile-Gender-Gap-Report-2019.pdf>

Notes from the Field During Covid-19

Mr Vinod. R

Can the truth be spoken about mourning of pedagogy in classrooms? Are we performing with resilience despite the collapse within?

As a teacher of psycho-social courses exploring identity, childhood, and self at Ambedkar University, I will be presenting some ruminations from my experience of teaching online during the Covid-19 pandemic, through this essay. Furthermore, my previous experience of teaching courses in the fields of education and psychology in offline mode acts as the foundation of my memory and nostalgia, from where I derive a sense of mourning in pedagogy in online mode.

I will not be sharing any specific experiences, events, or moments from online teaching as I believe that there are shared ethics of the classroom as a community, where each member contributes to making it a safe space for sharing, listening, empathizing, as well as disagreeing. So, what will I be discussing in the rest of the paper? I will be reflecting on some of the questions that as a teacher, I have had to grapple with due to the online mode of teaching. I am going to share some fragments of angst with a nascent wish to mourn to arrive at some elements of resilience and hope in this dystopian conversation.

While navigating through Covid-19 and online classes, as well as articulating the phenomenological experiences of online education, many thoughts zone into the realm of inequity, productivity, surveillance, control, accountability, care, coping, surviving, and living. Even though the virtual classroom does provide a structure and routine to teachers' and students' lives, amid the fear and anxiety of infection it also becomes a potential site of hyper-productivity as a way of denial against the reality of the impact of the pandemic.

Initially, most postgraduate programs responded to the crisis in different ways. One way of coping began with the use of multiple choice questions, question banks, and centralization of third-party institutions conducting the exams, where the university is not directly responsible for any spread of infection and is not accountable to students. As we refused to acknowledge the psycho-social challenges faced by the society during the pandemic, we kept working, thinking it to be a necessary way of surviving and performing care, despite feeling drained from within. I was teaching courses on experiencing the Self and Childhood, and Identity and Society for an M.A. psychology program, yet the lack of a mourning space became a silent sigh in the paradigm of efficient delivery of content and evaluation. The ritual of this normalcy concealed the trials, tribulations, and the vicissitudes of self of the teacher in mapping the losses, fragmentation, and the void. It reflected the resilience of breaking into pieces without falling apart.

The themes of the language of experience around this mourning reflect the loss of agency and community due to centralization of power and authority. This makes me wonder if some humans have become the virus we are fighting against, and have homes been colonized as workplaces in the name of compassionate outreach. Can these moments during the pandemic help us reflect its dystopian contents in the name of education? Transformation of classrooms from real to virtual, and its relationship to quality of education, the psychic death of relationships and notions of dialogue and democracy in the gendered nature of environment, space, time, and being have always been a potential site of silent mourning.

This, then, makes us ask other significant questions like, have we become teachers of the open classroom of the world? Are teachers content creators, delivery agents or copyright negotiators? What is the vision of the source of faceless questions, faceless responses, and content completion in online classrooms?

What can be taught when there is an epidemic, death, and collapse of the community in the name of the virtual? What is memorable in the experience of teaching and feedback without bodies being present? Can the truth be told of the narcissism and self-centeredness in relationships, the poverty of content in objective questions and answers, and the endless hours of time spent on feedback despite it remaining a collection of fleeting moments? Do we fear this regime as this has the potential to reduce us to non-beings?

It is in this backdrop of agency, potential, collapse, and humility that I wish to seek fellow travelers for a conversation around the myth of knowledge and certainty; and wish that we actually begin to care and listen to each other during this pandemic.

Some reflections that I would like to make are on pedagogy and its limits with regards to information and communication technologies (ICT). Online education, and its oppressive and simultaneously liberating potential, creates a sense of utopia despite its dystopian characteristics vis-a-vis democracy and inclusion. When 'T' of the term ICT drives the utopia of the nation, do we then exclude art, culture, history, and social hierarchies and its negation, basically knowledge itself, and focus entirely on information? Should we exclude the real community from the term 'C' and reduce it to communication, while focusing exclusively on the term technology as the panacea for all social inequality and injustice?

Can the poor design and control ICT networks rather than be mere recipients of information? Does it essentially mean that every communication will be a top-down centralized paradigm creating digital divides, access divide, skills and capacity divides, and therefore, eliciting developmental divide?

If global is the new local, then who actually gains in the name of efficiency? Development will be colonized by private companies like, Google, BYJU'S, Microsoft, Intel through their IoT (internet of things), machine learning, quantum computing and various programs. Are we going to go completely virtual right from field experiences, internships, community visit to villages, and be a community that merely delivers and shares information rather than being co-creators of knowledge?

Will teachers be reduced to consultants or gig workers, and students to consumers? Will private-public partnership finally be reduced to private partnership (the core of the ICT philosophy)?

Will education be reduced to information packets that need to be delivered, and teachers be reduced to deliverers? How do we envision the laws of the nation and apply them to the cyber world, which is hosted on the World Wide Web? Will there be a crisis of governance and will new norms be created for democracy, equality, dignity and solidarity? What will happen to the social values of universities; if profit, ranking, and accreditation in the global market become the new social ideals?

The themes that are worth examining in pedagogies are when teachers and teaching is not imagined as co-creation but as purely deliverers of content based on blooms taxonomy of quantitative and qualitative, cognitive, psychomotor and affective domains. If teachers are only envisioned as deliverers rather than curriculum developers and practitioners, this entrenchment in simultaneity of oppression and liberation, creation and reception, becomes a myopic insight to progress and transformation.

In the landscape of cyber control, if surveillance is understood as quality, then what happens to the agency of the teachers and students, and the space for teacher and student collectives? If all social protests become electromagnetic signals replacing human bodies and interactions, will we from this online worldview then, celebrate happy independence?

If the agency of teachers is reduced to a machine language and productivity determined by the 'likes' and number of students enrolled, will it finally lead to invisibilizing the teachers, their history, and struggles in the classroom?

If the seduction of the artificial intelligence worldview is going to be successful, who will address the ethnic biases, widening inequities, power consumption, global warming and the environmental dystopia it will usher? Who will address the vision of the digital along with aims of education and its relationship with equity, access and quality?

The past two years since the outbreak of Covid-19 have given us a glimpse into the nature of students' attention span, attendance, type of learning possible, death of wonder and

slowness in imagination. Have teachers in higher education felt the need to distribute ration, take family members of students affected by Covid-19 to hospitals or stay with the lowest common denominator of students who don't have access to these resources and stay with the loss which has been the reality in many schools? We love averages and efficiency so much that we dream of infinite possibilities and never mourn the limits of the dream. Can the best lesson plan and design of integrated computer systems replace teachers and stop investments in quality teacher education programs?

Do we hold on to our dreams of pedagogy and social imagination as an act of adaptation, or do we dwell on what this speed of efficiency and transformation refuses to acknowledge regarding our being, identity, and relationship with others as fellow teachers? I am wondering how do we sustain authenticity in conversations and relationships involving teaching and learning when parallel universes of games and social media share the same window of the classroom space. How can disclosures of identities that are still in the making find an expression in a caring and trusting environment in the online mode? How can we analyze and reflect upon the non-participation of students? How do we arrive at a meaningful relationship with knowledge and sustain students' curiosity? How do we settle in so many multiplicities in asking the question "who am I, and where am I going"?

Let's collectively look at moments when there is silence after the question in the online format of the classroom in disciplines like psychology, sociology, history, literature, and performance studies. We love our image and the narcissism of integration so much that we refuse its disintegration in front of us. This delay in answer seems so empowering for the student. Can this silence enable us to hear our dread, and if so, why do we not hear them in the use of technology?

I wish that the very mode of communication to students this way can be stopped and I am able to meet face-to-face over a cup of tea to share our silence. If we can have a retreat on this note in a space far away from the institution as teacher's community where there is potential space to transgress and be human. It has been my desire to share, how this duality of exploitation and progress, this impatience to wait, to listen, to care, the myth of knowingness, the desire for power, and innocence to be always useful and relevant despite the insignificance, marks the teacher's community.

Does that mean we would essentially conform and surrender than be spontaneous and free? Will we always live with the relationships with having, receiving, hoarding, and marketing mode with all its meta-pathologies? Will we ever learn the language of love and relate to community of all species through this model? Will we learn to respect our bodies and care for ourselves and others in this world through this presentation?

Despite all these questions, mourning, grief, and the pandemic, how do we still teach and speak the truth about the lack of care and health, that this mode of teaching and being is making inevitable. I believe that it is only through this mourning that there is a slight potential to take in the world and the words that we slowly want to dream as we dread its collapse ◆

EdTech Trends and Challenges

Ms Anusha Sharma

Context

While digitalization has been unfolding across sectors for a while now, it has gathered a lot of pace over the last couple of years, even more so during the pandemic. Parallely, we are also witnessing the rise of “platformization” – the dominance of web-based platforms such as Google, Amazon, Uber, etc., in facilitating social and economic activities in multiple spheres of life. Today, areas such as information search, social networking, transport, and e-commerce are all driven by platforms wherein data from interactions on the platform are harvested and analyzed to generate intelligence that contributes to optimizing the value of the product/service offered (ILO, 2021).

In education, due to the unexpectedly long school closures during the pandemic, the role of digital technologies increased significantly, as private and public education players attempted to provide digital education to their students in different ways. Although digital technology (EdTech) itself is not a new phenomenon in education and has existed for over 30 years, the intentions, objectives, and the pedagogical imagination for integrating it into teaching-learning processes are very different now from those that existed in the past. Earlier, EdTech was considered as a way to aid teaching in the classroom and not to substitute teacher engagement in the teaching-learning process, but now we’re headed that way. Although, EdTech, if designed keeping education aims, principles, contexts, needs, and priorities in mind and used appropriately for solving important problems, has enormous potential.

BYJU’S, India’s largest EdTech company by valuation, partnered with Google in June 2021 to offer educational content and “personalized learning” services cost-free to students in

India, thereby extending its footprint from test-preparation coaching for school education, and bringing in the ill-effects of platformization into the entire school education space. The period during the pandemic saw hundreds, if not thousands of EdTech companies mushrooming in the so-called K-12 education 'market', backed by venture capitalists. This article discusses the educational, economic, political, and ethical implications of this phenomenon.

Implications And Challenges

In a country like India where the obsession with board examinations, marks, and ranks is high, and where millions consider education as a vehicle for upward socio-economic mobility, EdTech firms profit by selling the idea that their product/services are what the children of poor, uninformed parents or those of middle-class parents with aspirations of a "wealthy life" need, to achieve "success" in education. Prolonged school closures during the pandemic enabled these firms to market technology tweaks and tricks to "patch-up" the loss of learning opportunities that children were enduring. As has been widely reported, predatory and aggressive marketing practices are used to exploit parents and trap them in loans without their knowledge or informed/explicit consent (Banerjee, 2022; Rao, 2022; Gowda, 2022). A report by Oxfam India explains how these companies use a "freemium model" where an initial free trial period is offered to students, which allows them to capture student/parent data. The data harvested about the student and the family is used by the company's sales agents to sell paid subscriptions, post the expiry of the free subscription (Kasinathan & Dasarathy, 2022).

"Personalized learning" that the most popular EdTech firms/platforms claim to offer, focuses predominantly on transacting quantized subject-related content in a manner attractive to students. Dijck and Poell (2015) define this as the "learnification" process wherein "the social activity of learning is broken into quantifiable cognitive and pedagogical units". This is a far cry from education in its true sense, which goes much beyond mere transaction of content knowledge. "Independence of thought and action, sensitivity to others' well-being and feelings, learning to respond to new situations in a flexible and creative manner, predisposition towards participation in democratic processes, and the ability to work towards and contribute to economic processes and social change" are the broad aims of education as elucidated in the National Curriculum Framework of 2005 (NCERT, 2006). The understanding of education as a social process where learning experiences in classrooms and communities facilitate the holistic development of the child is essential to achieving these aims. However, such holistic development is not possible for education technologies, though they make tall claims of improving "educational outcomes" through the use of algorithms and adaptive learning techniques.

Furthermore, the algorithms used by most of these private and for-profit companies lack transparency on the datasets harvested, and how these are processed and analyzed to make predictions. It's a black box that hides the developers' and designers' underlying bias which

may later manifest when being used to make decisions and have problematic effects such as perpetuating discrimination based on religion, caste, class, or gender (Kasinathan, 2020). Several studies of predictive technologies used in different contexts such as educational assessment, credit scoring, criminal justice, etc., report errors and biases influencing the algorithm's decision-making (Katwala, 2020; Heaven, 2020). It will also serve to formalize marginalization based on structural disadvantages because the "system" is considered to be neutral and objective although it is likely to reproduce the beliefs and biases held by humans. While in the past there have been waves of technologies promising transformation and we have seen that they did not really make any real impact on education, the current wave of digital technologies driven by AI and ML cannot be ignored and dismissed as not being capable of bearing impacts on education, especially negatively, because the digital being 'scalable', is a medium that is capable of doing large-scale damage. Developing agency and autonomy of individuals are important aims of education and ensuring privacy and dignity are key to achieving them. Black box algorithms hiding biases of the developers and the EdTech companies, certainly carry the risk of teacher de-skilling and the dilution of teacher and learner agency.

Prolonged school closures during the pandemic created the need to provide remote education to students through online classes, multimedia lessons, digital learning resources, etc. School systems, both public and private, made attempts of varying efficacy to provide digital, remote education to students through different means. As a result, an increased receptivity in teachers and other stakeholders in the education system towards technology usage has been observed. This, coupled with the emphasis on technology integration in NEP 2020, are driving state governments across the country to launch EdTech programs through for-profit EdTech vendors. For instance, the Maharashtra and Andhra Pradesh governments have recently announced MoU's with BYJU'S to distribute its content to students through tablets. There is lack of awareness and evaluation abilities on the part of governments to assess the cost-benefit of such initiatives and as a result, not enough thought and planning appears to have gone into assessing what kind of programs would actually be beneficial in the context of the government school system, or what may be the implications and risks involved in the BYJU'S model. This aspect is evidenced by a Human Rights Watch study (2022) on violations of children's rights during the pandemic by EdTech platforms that were endorsed by governments across the world (including India). The study found that a majority of the online learning platforms investigated had the "ability to harvest data about children without the children's or the parents' consent, and violated or put their privacy and other rights at risk for purposes unrelated to their education". Data about who they are, their location, their device and activity on the device, their contacts, etc., could be monitored. In a country like India where the EdTech sector is currently unregulated, and the Personal Data Protection Bill, which could have served to safeguard the rights and privacy of children, has recently been withdrawn, this data would easily be exploited by advertisers, commercial entities, or others to seriously undermine children's rights. Governments must recognize the hidden costs behind the supposedly "free" products/services that for-profit entities are offering to collect and harvest student/parent data, before they embrace such options.

Conclusion

Mere technology adoption or integration cannot offer solutions to long persistent structural issues in the education system. Education technology needs to be looked at comprehensively, to evaluate and identify how digital technology should enable teaching-learning processes, curriculum design and development, teacher development, etc. Participatory governance of EdTech (by having representatives of teachers, parents, and civil society representatives) to ensure that the way it is being implemented is in the best interest of students and not technocrats is necessary. Therefore, a comprehensive framework for evaluating EdTech products and services taking into account technological, pedagogical, political, and economic parameters is imperative ♦

References

1. Banerjee, O. (2022). *The making of a loan crisis at BYJU'S*. The Ken. <https://theken.com/story/the-loan-crisis-at-BYJUS/>
2. Djick, J.V., & Poell, T. (2015). Higher Education in a Networked World: European Responses to US MOOCs. *Consumer Social Responsibility eJournal*, Vol 9, pp. 2674–92.
3. Gowda, V. (2022). *Selling hope: Parents fall for ed-tech's false promises*. Deccan Herald. <https://www.deccanherald.com/specials/insight/selling-hope-parents-fall-for-ed-techs-false-promises-1109289.html>
4. Heaven, W. D. (2020). *Predictive Policing Algorithms Are Racist: They Need to be Dismantled*. MIT Technology Review. <https://www.technologyreview.com/2020/07/17/1005396/predictive-policing-algorithms-racist-dismantled-machine-learning-bias-criminal-justice>
5. Human Rights Watch. (2022). “How Dare They Peep into My Private Life?” *Children's Rights Violations by Governments That Endorsed Online Learning During the Covid-19 Pandemic*. <https://www.hrw.org/report/2022/05/25/how-dare-they-peep-my-private-life/childrens-rights-violations-governments>
6. ILO. (2021, September). *Platform Labour in Search of Value: A Study of Workers' Organising Practices and Business Models in the Digital Economy– Executive Summary*. https://www.ilo.org/global/topics/cooperatives/publications/WCMS_818932/lang--en/index.htm.
7. Katwala, A. (2020, August 15). *An Algorithm Determined UK Students' Grades: Chaos Ensued*. Wired. <https://www.wired.com/story/an-algorithm-determined-uk-students-grades-chaos-ensued/>

8. Kasinathan, G. (2020). *Making AI work for Indian Education*. IT for Change. <https://itforchange.net/reconceptualising-development-times-of-digital-intelligence>
9. Kasinathan, G., & Dasarathy, A. (2022). The Edtech Leviathan. *Economic & Political Weekly*. <https://www.epw.in/journal/2022/1/perspectives/edtech-leviathan.html>
10. Kasinathan, G., & Ganapathy, A. (2022). *Digital dollar? An exploratory study of the investments by IFC in the Indian Educational Technology Sector*. Oxfam India. <https://www.oxfamindia.org/knowledgehub/workingpaper/digital-dollar-exploratory-study-investments-ifc-indian-educational-technology-sector>
11. NCERT. (2006). *National Focus Group on Aims of Education*. <https://ncert.nic.in/pdf/nc-framework/nf2005-english.pdf>
12. Rao, M. (2022). *The bait and hook of EdTech*. The Hindu.
13. <https://www.thehindu.com/education/the-bait-and-hook-of-EdTech/article65320492.ece>

