

Uncertainty factors in on-line education due to covid-19 pandemic during march to may 2020

Devanshi M. Dalal, Dipa M. Dalal and Dr. Mahesh K. Dalal

Abstract— The novel coronavirus caused pandemic COVID 19 which affected the whole world since December 2019. As social distancing was to be observed in absence of any vaccine for COVID 19 to arrest its fast spread, lockdown was imposed in several parts of the world. Lockdown affected education system as schools, colleges and universities were closed to reduce contacts and save lives. Thus on line education became necessary to engage students to complete their curriculum or extra curricular activities. Present paper discusses factors arising out of uncertainty related to on-line education of school, college and research students with respect to learning, psychological impact and evaluation.

Keywords—COVID-19, Online education, education system, lockdown.

I. Introduction

Global health crisis Covid 19 pandemic caused by novel coronavirus has impacted people on a massive scale. Lockdown and social distancing rules were followed by several countries to keep citizens safe and reduce spread of covid-19. However large number of people are infected globally and many people died. It is believed to soon turn into an endemic.

With almost all countries of the world affected adversely, education institutes like schools, colleges and universities remain shut to arrest spread of this disease. As ongoing studies were interrupted, global education fraternity soon adjusted to online education. Many students were well versed with online education but majority of students were new to online education.

Thus learning by student and their evaluation by teacher in this way is uncertain compared to classroom education. It will

Devanshi M. Dalal
Nagar School of Optometry, Gujarat University
India

Dipa M. Dalal
C.U.Shah Science College, Gujarat University
India

Dr. Mahesh K. Dalal
Shri J.J.T.University
India

be interesting to study impact of online education during lockdown period with respect to uncertainty factors. Present paper discusses various factors of uncertainties in online education of school, college and university students during March to May 2020.

II. Method

Various on-line education related research papers, reports and articles particularly during lockdown period were studied and discussed.

III. Discussion

Many countries have appropriately decided to close schools, colleges and universities due to COVID 19 pandemic related global health crisis. The crisis culminates the dilemma that policymakers are facing between closing of education institutes (thereby reducing contact to arrest infection spread and saving lives) and keeping them and offices open (thereby allowing workers to work and maintain the economy). The severe short-term disruption is very much felt by many families around the globe. Home schooling is a massive shock to parents' productivity, and also shocking to children's social life and learning. However, teaching is moving online, on an untested and unprecedented scale. Student assessments are also moving online, with a lot of trial and error and uncertainty for everyone. Many assessments in schools, colleges and universities have simply been called off. Importantly, these interruptions will not just be a short-term issue, but can also have long-term consequences and are likely to increase inequality. ¹ Going to school is the best public policy tool available to raise skills. School time can be fun and can raise social skills and social awareness. From an economic point of view the primary point of being in school is that it increases a child's ability. Even a relatively short time in school does this; even a relatively short period of missed school will have consequences for skill growth. How much the COVID-19 interruption will affect learning is interesting to estimate.¹

Children are not generally just sent home to play after school hours. They are sent to continue their education at home (home schooling), in the hope of not missing out too much. Families are central to education and are widely agreed to provide major inputs into a child's learning, as described by Bjorklund and Salvanes (2011). Present longer duration on-line teaching is like extension of home schooling. The current global-scale expansion in home schooling might initially be seen quite positively, as likely to be effective. But that may

not be the fact. Parents supplement a child's mathematical learning by practicing counting or highlighting simple mathematical problems in everyday life; or they illuminate history lessons with trips to important monuments or museums. Parents are prime driver of learning but in online materials, scenario is different. Many parents round the world do successfully school their children at home, but this may not be generalized over the whole population. Global home schooling will surely produce some inspirational moments, some angry moments, some fun moments and some frustrated moments. But it seems very unlikely that it will on average replace the learning lost from school. There will be substantial disparities between families in the extent to which they can help their children learn. Key differences include (Oreopoulos et al. 2006) the amount of time available to devote to teaching, the non-cognitive skills of the parents, resources (for example, not everyone will have the kit to access the best online material), and also the amount of knowledge – it's hard to help your child learn something that you may not understand yourself. Consequently, this will lead to an increase in the inequality of human capital growth.¹

Interesting studies were carried out around the globe on online education as all learning institutions pre-maturely closed around 20 March 2020 and all citizens advised to self-isolate in a bid to control the spread of COVID-19. It was hypothesized that COVID-19 would negatively impact on the performance of students in the 2020 Grade 12 national examinations vis-à-vis mathematics, science and design and technology subjects in Zambia. Steady increase was observed in the number of COVID-19 confirmed cases in this country which has just rolled out a nation-wide implementation of STEM education. The low levels of technology use in secondary schools in Zambia due to limited technology resources signifies a very difficult period in the country. This study collected data from three teachers at a public secondary school in Chipata District of Eastern Province in the Republic of Zambia. The Head of Department for Mathematics, the Head of Natural Sciences Department and one science teacher were interviewed. Semi-structured interviews via mobile phone were used to collect views of what these specialists thought would be the COVID-19 effects on the general performance of students in their subject areas. Results of this study revealed that there is likely to be a drop in the pass percentage of secondary school students in this year's national examinations if the COVID-19 epidemic is not contained in the shortest possible time considering that the school academic calendar was abruptly disturbed by the early untimely closure of all schools in the country.²

Studies in developed countries were also carried out as the closure of schools, colleges and universities interrupted the teaching for students around the world. The closure also coincided with a key assessment period and many exams were postponed or cancelled. Internal assessments are perhaps thought to be less important and many have been therefore

cancelled. But internal assessment is to give information about the child's progress for families and teachers. The loss of this information delays the recognition of both high potential and learning difficulties and can have harmful long-term consequences for the child.¹ It is also possible that some students' careers might benefit from the interruptions. In example, in Norway it has been decided that all 10th grade students will be awarded a high-school degree. This has led to many non-deserving or low-caliber students to pass out. And Maurin and McNally (2008) show that the 1968 abandoning of the normal examination procedures in France (following the student riots) led to positive long-term labour market consequences for the affected cohort.¹ The careers of this year's university graduates may be severely affected by the COVID-19 pandemic. They have experienced major teaching interruptions in the final part of their studies, they are experiencing major interruptions in their assessments, and finally they are likely to graduate at the beginning of a major global recession. Evidence suggests that poor market conditions at labour market entry cause workers to accept lower paid jobs, and that this has permanent effects for the careers of some. Oreopoulos et al. (2012) show that graduates from programmes with high predicted earnings can compensate for their poor starting point through both within- and across-firm earnings gains, but graduates from other programmes have been found to experience permanent earnings losses from graduating in a recession.¹ In higher education many universities and colleges are replacing traditional exams with online assessment tools. This is a new area for both teachers and students, and assessments will likely have larger measurement error than usual. Research shows that employers use educational credentials such as degree classifications and grade point averages to sort applicants (Piopiunik et al. 2020). New graduates in the labour market might experience slower earnings growth and higher job separation rates. This is costly both to the individual and to the society as a whole (Fredriksson et al. 2018).¹

Factors of Uncertainty among Many challenges are described below:

Teacher adaptability to new technology is very important. Availability of internet is also a challenge. The issues highlighted by the two UN agencies are echoed by teachers in India as well, some of whom have been pointing this out to the government from time to time. A teacher at University College said "After we received directions from Delhi University, we started teaching our students online, but there are many challenges with it. Students who are in big cities with a good internet connection have been able to join in for the classes, but those who went back home to their villages or are in small towns struggle with the internet speed and are mostly unable to attend." He added that the disadvantage would prove particularly unwieldy during exam time. Opinion is correct "If the university plans to go for online exams, half the students who are in towns and villages of the states will fail for sure

because they will not be able to connect,” he added. A teacher from a government institute said, “How can we expect to teach students in rural areas through mobile and Zoom classes? We have decent network for a video call for a few minutes, but how will they continue a 40-minute class?” The teacher added that many of the students didn’t “have the kind of devices, laptops, smartphones... or money to keep the connection going”. These are real challenges that hinder the process of online learning. Some school teachers complained that they were themselves struggling to get a hang of the technology. “The school wants us to make PPTs (Powerpoint presentations), record video lectures, take online classes through different apps, but they do not offer any clear instructions as to how this should be done,” a 63-year-old private school teacher said. “How do they expect a 60-plus teacher, not technically sound, to make this work?”³

Guru-Shisya Parampara where teachers were available 24 x 7 as disciples stay at teacher’s home (Gurukul in Ramyana, Mahabharata etc.) during study is back in new form as student is in his home and teacher available on phone, internet as and when needed. However in Gurukul, Teacher taught all subjects including cooking, social behaviour, Vedas, leadership etc. whereas in on-line education, different teachers teach different subjects as per curriculum. However there is always an eye to eye contact in classroom teaching enabling teacher to judge concentration and interest of student in the subject taught which is lacking in on-line education which means at many times, student may be eating, watching TV or playing while being logged on for on-line class! There may be interruptions due to internet problems or technical problems, login delays due to weak signal, chaos due to other students constantly complaining on interruptions, inferior voice quality, inability to login in time etc. which may result in inability to learn and by the time, student get involved, explanation sought may not be available properly and on-line session may time out. Lack of practice and experimentation (practical class) rob off practical knowledge for the period and if not taken up post lockdown, it may create a void.

Uniform in school indicates necessity of discipline in learning process. It also emphasise on values like social behaviour, sharing etc. In on-line learning , uniform is never a necessity. The feeling of being in uniform and general discipline related to it with feeling of being in school is absent. This can dilute student concentration in study.

Teacher/ student adaptability to technology used in online teaching is also to be considered as it will impact effectiveness of the process. Screen time guidelines indicate clear time limits to be followed daily on using gadgets. However with online classes only option in lockdown, time limits can not be followed strictly as student also use smart phone or laptop for entertainment/ gaming apart from study. Even durinf on-line class, student use more than one gadget: one for online class,

one for e-book, one for assignment etc. More screen time results in more exposure to blue light on eyes impacting eye health in long duration.⁴

Hacking of on-line class is a serious issue threatening personal data safety. Time limitation of online session is already a big issue and hacking during online class force it to abandon apart from threat of data stealing.

Technology made us a global village bringing people together to make one world family but lock down has torn it apart by separating and distancing people. Social distancing is the new normal. It is advisable to co-ordinate on shortcomings of online teaching by parent teacher interactions at regular interval to correct it.

Socio-constructive instructional designs for online-based learning focus on interaction and communication of students to allow in-depth learning. The objective of this study was to analyze whether increased interaction of students in online-based learning settings may contribute to better outcome. They developed indicators for presence, participation, and interactivity of students. Extracted log data from the learning management system for 31 students in 10 online courses (n=123 course attendances). Correlated indicators to final grades and also applied a decision tree based machine learning approach. They found only weak to moderate correlations between the indicators and final grades, but acceptable results concerning prediction of students' success based on the indicators. These results support the theory that student presence and participation in online-based courses is related to learning outcome.⁵

Cao et al studied psychological impact of COVID-19 epidemic spreading in China and other parts of the world since December 2019. The epidemic has brought not only the risk of death from infection but also unbearable psychological pressure. College students from Changzhi medical college were sampled by using cluster sampling. They responded to a questionnaire packet that included the 7-item Generalized Anxiety Disorder Scale and those inquiring the participants' basic information. 7,143 responses were received. Results indicated that 0.9% of the respondents were experiencing severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety. Moreover, living in urban areas, family income stability and living with parents were protective factors against anxiety. Moreover, having relatives or acquaintances infected with COVID-19 was a risk factor for increasing the anxiety of college students. Results of correlation analysis indicated that economic effects, and effects on daily life, as well as delays in academic activities, were positively associated with anxiety symptoms. However, social support was negatively correlated with the level of anxiety. It is suggested that the mental health of college students should be monitored during epidemics.⁶

Learning as a constructive process works best in interaction with other learners. Support of social interaction processes is a particular challenge within online learning settings due to the spatial and temporal distribution of participants. It should thus be carefully monitored. Ammenwerth et al present structural network analysis and related indicators to analyse and visualize interaction patterns of participants in online learning settings. Ammenwerth validated this approach in two online courses and show how the visualization helps to monitor interaction and to identify activity profiles of learners. Structural network analysis is a feasible approach for an analysis of the intensity and direction of interaction in online learning settings.⁷

Using a large administrative dataset from a statewide system including 34 community and technical colleges, the authors employed an instrumental variable technique to estimate the impact of online versus face-to-face course delivery on student course performance. The travel distance between each student's home and college campus served as an instrument for the likelihood of enrolling in an online section of a given course. In addition, college-by-course fixed effects controlled for within- and between-course selection bias. Analyses yield robust negative estimates for online learning in terms of both course persistence and course grade, contradicting the notion that there is no significant difference between online and face-to-face student outcomes—at least within the community college setting. Accordingly, both two-year and four-year colleges may wish to focus on evaluating and improving the quality of online coursework before engaging in further expansions of online learning.⁸

Online lessons are helping educational institutions around India beat the Covid-19 lockdown to push ahead with the academic calendar. But the trend has raised many concerns among educational experts, including those at UNESCO and UNICEF. Some have expressed alarm about the potential dangers of internet exposure for young children, whereas some say they are scared the digital shift may alienate economically disadvantaged students who don't have access to the technology digital lessons require. The United Nations Children's Fund (UNICEF), which is engaged in humanitarian aid for young ones around the world, on 15th april, said "millions of children are at increased risk of harm as their lives move increasingly online during lockdown in the Covid-19 pandemic". According to the statement, the internet exposure puts children at the risk of online harassment, exploitation and grooming, as predators look to exploit the Covid-19 pandemic". Online grooming, a worrying product of the internet and social media age, involves predatory adults building online relationships with gullible children and tricking or pressuring them into illegal exploitation.⁹

"Under the shadow of Covid-19, the lives of millions of children have temporarily shrunk to just their homes and their screens. We must help them navigate this new reality," the statement quoted UNICEF executive director Henrietta Fore

as saying. In a report issued on 21 April, the United Nations Educational, Scientific and Cultural Organisation (UNESCO), a multi-dimensional agency, highlighted another concern about the online shift. Giving a global perspective, UNESCO noted, "Half of the total number of learners — some 826 million (82.6 crore) students — kept out of the classroom by the Covid-19 pandemic, do not have access to a household computer and 43 per cent (706 million or 70.6 crore) have no internet at home, at a time when digitally-based distance learning is used to ensure educational continuity in the vast majority of countries."¹⁰

However, it can not be overlooked that in the absence of online education, whole education system could have stopped abruptly during lockdown. It is new technology and gadgets that kept the system running for students around the globe beating lockdown.

iv. Conclusion

As Lockdown was undoubtedly essential to save lives, on-line education was necessary to keep schools, colleges and university teaching running. There are uncertainty factors related to student focus and involvement, discipline, psychology, fair evaluation etc. but that can be overcome on discussing and detecting it. In present circumstances around the globe, on-line education provided the best alternative to continue abruptly disrupted education system.

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About Author (s):



Devanshi M. Dalal is currently pursuing M.Optom. at Nagar School of Optometry, Gujarat University, Ahmedabad. She won 10 gold medals at B.Optom. She has presented research papers in conferences in India and abroad and published 4 research papers.



Dipa M. Dalal is M.Phil. in Zoology and teaching Zoology at Biology Department , C.U.Shah Science College, Gujarat University since 30 years. She has presented many online/TV channel lectures.



Dr . Mahesh K. Dalal is M.Sc.,Ph.D.,D.I.B.M. and has vast experience in Chemical and Pharma Industry, Academy and Research institute and published/presented many research papers at National/International conferences. He is Ph.D. guide at Shri J.J.T.University, Rajasthan, India.