

Improvement in the Environment and Change with the Adoption of Technology Post Covid-19 Pandemic vis-à-vis Education Sector in India

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Abstract

In India, the economic impact of the COVID-19 pandemic has mainly been disruptive. The sector impacted most is Education. Which is the backbone of the country's future. Still, due to COVID-19 impact, education is the striking sector, all the offline educational activity from School/Colleges is called off till July 2021. As a side effect the sector has to change totally and pressurized to adopt the technology for remote learning. To measure the change and impact of the pandemic on education, a sample of 2000 respondents, including 1000 students, 1000 Teachers, is selected across India and analysed by using the multiple regression tool to develop a COVID-19 impact model. The study reveals a noticeable impact on Educational sector due to the Pandemic in India.

Keywords: COVID-19; education; disruptive technology, India

1. Introduction

As the COVID-19 disease spreads wide across the country, the Indian State governments have ordered the closure of schools and educational institutes until May 2021, and the Economy of the country has shown no sign of growth after that since the lockdown (Guerrieri *et al.*, 2020; Prem *et al.*, 2020; Rio-Chanona *et al.*, 2020) [25]. With the Covid-19 pandemic, it is estimated that India loses over 32,000 crores every day (US\$4.5 billion) complete during a lockdown of the first 21-days (PTI, 2020) [27]. Within just half a quarter, \$2.8 trillion of Indian economic activities was not functional (Business Insider, 2020). Mukherji (2020) [20] revealed that 53% of businesses were significantly affected. Another sector but the Supply chain, was also placed below pressure with the lockdown limitations, primarily, lack of clarity in restructuring the essential (Chaudhry, 2020). The significant danger is for the daily wage and informal sectors (Goutam, 2020) [12]. Chaudhry (2020) also explained that the farmers growing perishables were also uncertain about their future. Hotels and airlines businesses are also cutting salaries and lay off employees. India has unemployment rate of more than six percent in January 2021. This damaging impact is caused due to a total lockdown; hence the unemployment rate went up to nearly 24 percent in April 2020. This is also a result of a decrease in demand that resulted in a GVA loss of more than 9% for the Indian economy that month.

Rajasthan was one of the first northern states of India to impose a state-wide lockdown on March 19, 2020. The Rajasthan state government has also allocated an amount of 1,200 crores. It has also made expenditure under public distribution system to provide free wheat for beneficiaries of the National Food Security Act (The Hindu, 2020) [34]; further, the spending of state the government on per person on

quarantine centres is 2440, and the government is also paying Rs.2500 as a relief to the to about 14 million low-income families (ToI, 2020) [36]. However, infant and child mortality and maternal mortality are the positively impacted areas (McKibbin& Fernando, 2020; Bloom & Sachs, 1998; Bhargava *et al.* 2001; Robalino *et al.*, 2002; Cuddington *et al.*, 1994; WHO, 2001) [17, 28]. But the education sector, employment, and economy of the country are majorly suffering due to this pandemic situation. Thus, my research is based upon measuring the impact of this situation over education sector and developing an impact Model so that the proper suggestions can be provided to come out from this situation.

For school children, the closure of educational institutions has hampered children's studies, and even examinations have also been postponed. School exams other than the board examination were not conducted and suggested to develop a new marking system or used the past assessments to promote the students to the next grade. As a service sector, Education sector force to adopt dual change because of this pandemic situation; the students must learn with online modes as they have increasingly turned to the online mode of teaching during this transitory phase (Guerrieri *et al.*, 2020). This needs skill at both ends. The teachers need first to learn and then teach with the online applications, and students must learn by the same method (Guerrieri *et al.*, 2020; Kraemer *et al.*, 2020; Prem *et al.*, 2020) [25]. This is challenging at both ends as both may not be expert on the technology side. The system also lacks attraction, personal attention, and it is very hard to make students continuously engaged in classroom learning. Students and teachers both work from their home with their difficult household circumstances like working parents issues, lack concentration in joint family structure, no

individual attention in the nuclear family and other technical issue like network connectivity problem, and incompatible mobile or computing devices for online platforms (Prem *et al.*, 2020) [25].

2. Reviews of Literature

Closing of educational institutes, including schools to universities, interrupting the teaching for students worldwide; further, the exams have also been suspended or cancelled (Burgess & Sievertsen, 2020; Chui *et al.*, 2020) [4]. The major interruptions for school to university teaching in the final part of their studies and assessments are found with a major business sector global recession, and their careers may be severely affected (Lytras *et al.*, 2020; Piopiunik *et al.*, 2020) [16, 23]. More than 220 million children, with 180 million primary and secondary students and 47 million preschool children, were also affected, as per the Ministry of Education (CCTV News, 2020). This also impacts their health with a pause in the mid-day meal plan (Van & Parolin, 2020) [39]. This has also give challenges for teachers for change in teaching tools used for online teaching, which are typically not used by the teachers before (Goh and Sandars, 2020; Al-Sabbah *et al.*, 2021; Al-Kumaim *et al.*, 2020). The use of technology is on the teachers who previously not used these tools earlier and have no experience to use (Chatterjee and Chakraborty 2020; Phuah *et al.*, 2018, Cleland *et al.* 2020; Vlachopoulos 2011; Al-Sabbah *et al.*, 2021).

India is a country of villages where internet and mobile technology is not very frequent. Hence, internet connection and speed are the major problems they cannot by themselves address (Walger *et al.* 2020; Eadie *et al.* 2021) [42]. Another problem for the teachers is to create the interaction and attention of the students, which is the new and first-time experience for them (Jum’ah *et al.* 2020; Tabatabai 2020) [33], as well as the active participation of the student is subject to the availability of communication device at the student's end (Moser *et al.*, 2021; Kuhfield and Tarasawa 2020, Upoalkpajor and Upoalkpajor 2020). Moreover, the availability of upgraded communication devices at the teacher’s end are the major issues they need to cope with (Carpenter *et al.*, 2020; Hussein *et al.*, 2020). Submission of assignment at the end of students and online evaluation of the same at the teacher end creates other problem (Pokhrel and Chhetri 2021; Whalen 2020).

Online Education at the student end was not accessible. The change in teaching tools is also not easy for them to adopt (Eadie *et al.*, 2021; Burgess and Hans 2020) [4] since the technology is not friendly for students (Kuhfield and Tarasawa 2020) and in the case of small children’s the ease of use of technology is not possible (Chouhan *et al.*, 2020; Goswami and Chouhan 2021) [10, 14]. For teachers, the internet connection and speed at their location are central to the relationship between student and teacher (Tabatabai 2020; Jum’ah *et al.* 2020) [33]. The interaction with the home environment can make the problem for them also (Jum’ah *et al.* 2020, Hays *et al.*, 2020) [15] where they are not finding a place for study with the connection problem (Al-Sabbah *et al.*, 2021; Carpenter *et al.*, 2020; Upoalkpajor and Upoalkpajor 2020, Whalen 2020) [38, 44]. Further, the availability of communication device for small children at their home is also a problem (Moser *et al.*, 2021, Tay *et al.*, 2020) [19]. The assignment and homework help and submission (Pokhrel and Chhetri 2021) [24] are concerned in the absence of a suitable device. As a result, the low-income group is a significant sufferer as the high-income group student may use online

courses (Cantillon *et al.*, 2017) [6]. Wang *et al.* (2020) [43] have shown how school children can ease the properties of home incarceration (Zhang *et al.*, 2019; Van & Parolin, 2020) [45, 39]. The variables selected with their references in the reviews are presented in table 1 as under:

Table 1: ROL Summary

Sector	Variable	Reference by
Education Sector (Teacher)	Change in teaching tools	Goh and Sandars (2020); Al-Sabbah <i>et al.</i> , (2021), Al-Kumaim <i>et al.</i> , (2020)
	Impact on use of technology	Chatterjee and Chakraborty (2020); Phuah <i>et al.</i> , (2018)
	Ease of use of technology	Cleland <i>et al.</i> (2020); Vlachopoulos (2011); Al-Sabbah <i>et al.</i> , (2021)
	Internet connection and speed	Walger <i>et al.</i> (2020) [42]; Eadie <i>et al.</i> (2021)
	Students Interest creation	Jum’ah <i>et al.</i> (2020)
	Active participation of student	Kuhfield and Tarasawa (2020)
	Availability of communication device to students	Moser <i>et al.</i> , (2021) [19]; Upoalkpajor and Upoalkpajor (2020) [38]
	Availability of Communication devices at your end	Carpenter <i>et al.</i> , (2020); Hussein <i>et al.</i> , (2020)
	Students’ interaction	Tabatabai (2020) [33]
	Assignment and homework checking	Pokhrel and Chhetri (2021) [24]; Whalen (2020) [44]
Education Sector (Student)	Change in teaching tools is not easy	Eadie <i>et al.</i> , (2021); Burgess and Hans (2020) [4]
	Technology is not friendly for us	Kuhfield and Tarasawa (2020)
	Ease of use of technology is not possible	Chouhan <i>et al.</i> , (2020) [10]; Goswami and Chouhan (2021) [14]
	Internet connection and speed at our location	Tabatabai (2020) [33]; Jum’ah <i>et al.</i> (2020)
	Interaction with home environment problem	Jum’ah <i>et al.</i> (2020), Hays <i>et al.</i> , (2020) [15]
	Interest can be easily lost	Al-Sabbah <i>et al.</i> , (2021); Carpenter <i>et al.</i> , (2020); Upoalkpajor and Upoalkpajor (2020) [38]
	No direct contact so no eye fear	Whalen (2020) [44]
	Availability of communication device at my home	Moser <i>et al.</i> , (2021) [19]; Hussein <i>et al.</i> , (2020)
	Availability of Communication devices at Teachers end	Moser <i>et al.</i> , (2021) [19], Tay <i>et al.</i> , (2020)
	Assignment and homework help and submission	Pokhrel and Chhetri (2021) [24]

3. Methodology

The methodology adopted for the current study includes the survey of respondents for a comprehensive way overall impact of the COVID-19 problems. The study data was gathered via two different questionnaires with google documents format to obtain responses from the respondents.

For this study, the universe of the survey includes all the students and teachers of India. For taking a good representation of all the two-section total 3000 questionnaire were distributed to the select respondents, and due to inappropriate responses, a final sample of 2000 respondents are included in the study that consists of 1000 students and 1000 Teachers. The study variables are divided into two segments of students, and Teachers. The data is gathered from the students as they are staying at their home. By taking the list of CBSE approved schools which spread all over the country, 100 schools were selected at random from 25 states of the country using a random sample method, and as per their demographical profile, the judgmental sample is taken and from each age group, 15 students were contacted from each school to take part in the study.

Further from the same school, 15 teachers were also contacted randomly to take part in the study. The proper care is taken while sampling so that the overall impact of the COVID can be measured. The t-test and regression are used to identify the significant variables for developing an impact model of COVID-19 pandemic situation, including the education sector, employability, and economic impact in India.

4. Data Analysis

Demographic details of the respondents considered in this study are presented in Table 2. To analyse the data first, the demographical data is to be presented in table 2 as under:

Table 2: Demographic details of respondents

Criteria	Values for other participants/Students	Educator (%)	Students (%)
Age	18-25 years/5-10 years	10	25
	25-40 years/10-12 years	58	49
	above 40 years/12-16 years	32	36
Education	School Education/5-8	0	34
	Graduate/8-10	45	43
	Post Graduate 10-12	55	23
Gender	Male	48	58
	Female	52	42

The study is conducted with the help of all two category respondents, i.e., educator and students. Data for current study is collected from the educator, including 58 percent from the 25 to 40 years, which means that the young educator can impart the knowledge by adopting the new technology. The student includes a maximum of 49 percent with 10 to 12 years of age and have a proper understanding of the research and

can present their views.. The education-wise maximum educator was having post-graduation degree with 55 percent respondents, in case of students maximum (43 Percent) were in class 8-10. Thus, the study has a proper representation of both the types and all categories of respondents.

To create impact model as per the objective of the study the views on the impact on students, and teachers is taken from India and first, the significant impact on each of the participant's category is measured following hypothesis were made:

H_{1(a)} = The impact of the COVID-19 pandemic is significant for the education sector of India.

To test the above hypothesis, the one-sample t-test is applied by using SPSS-19 software. The results are summarised in Table3.

Table 3: t test

Demographics						
Variables	N	\bar{x}	σ	S.E.		
Imp_edu	2000	3.8150	.81697	.04085		
Imp_ch_edu	2000	2.2925	1.13586	.05679		
t-Test						
	t	df	Sig. (2-tailed)	X- \bar{x}	95% Conf. Interval	
					Low	High
Imp_edu	32.192	1999	.000	1.31500	1.2347	1.3953
Imp_ch_edu	-3.654	1999	.000	-.20750	-.3192	-.0958

The result of the 't-test' presented in Table 3 reveals a significant gap exists between the test standards with the intended sample statistics impact of the COVID-19 pandemic on Education of India ($p < 0.05$) at α 5% (sig.).

Further, in the second stage to develop an impact model, respondents' views on the various areas are checked with the following broader hypotheses.

H_{1(b)}: Covid-19 pandemic makes a significant impact on Educators in India.

H_{1(c)}: Covid-19 pandemic makes a significant impact on school children in India.

To identify critical variables for Covid-19 impact, multivariate regression analysis has been used, and results were shown in Table 4 as under:

Table 4: Multiple regression analysis Result

(A) Descriptive Statistics			
Variables	SPSS code	Mean	Std. Deviation
Impact on Education	Imp_edu	3.8150	.81697
Change in teaching tools	Imp_Educat_1	4.0700	.76260
Impact on use of technology	Imp_Educat_2	3.5625	1.20820
Ease of use of technology	Imp_Educat_3	2.7675	1.47780
Internet connection and speed	Imp_Educat_4	1.9100	.87682
Students Interest creation	Imp_Educat_5	2.9725	1.00462
Active participation of student	Imp_Educat_6	2.5000	.99371
Availability of communication device to students	Imp_Educat_7	3.0550	1.12255
Availability of Communication devices at your end	Imp_Educat_8	2.1775	.64965
Students' interaction	Imp_Educat_9	3.4450	.98712

Assignment and homework checking	Imp_Educat_10	3.4725	1.03776
Impact on Students	Imp_ch_edu	2.2925	1.13586
Change in teaching tools is not easy	Sch_chil_1	2.0525	1.07826
Technology is not friendly for us	Sch_chil_2	1.5350	.49940
Ease of use of technology is not possible	Sch_chil_3	3.4125	.91894
Internet connection and speed at our location	Sch_chil_4	1.4925	.65652
Interaction with home environment problem	Sch_chil_5	4.3775	.81956
Interest can be easily lost	Sch_chil_6	4.0675	.75788
No direct contact so no eye fear	Sch_chil_7	4.1175	.89761
Availability of communication device at my home	Sch_chil_8	3.7425	1.14651
Availability of Communication devices at Teachers end	Sch_chil_9	4.3525	.70675
Assignment and homework help and submission	Sch_chil_10	3.5125	1.24044

[N= 2000 (1000 each)]

(B) Main Results					
Variables	Variable name	Adj. R2	Beta	ANOVA	Sig.
Educators (Constant 3.811)	Imp_Educat_2	82%	.084	5.530	.004 ^c
	Imp_Educat_9		.085		
Students (Constant 0.977)	Sch_chil_7	79%	.222	11.215	.000 ^c
	Sch_chil_2		.263		

The regression result in table 4 shows that for Educators, the value of Adjusted R square is 82% with Dependent Variable of Impact and Predictors of Imp_Educat_2 and Imp_Educat_9. The Model fit ANOVA F-Ratio is 5.530 with a significant value of .004. Result revealed that that the outcome is appropriate to predict. The study concludes that only two variables Imp_Educat_2 and Imp_Educat_9, are predicting the impact on Educators of India.

For student's regression result shows the value of Adjusted R square is 79% with Dependent Variable of Impact and Predictors of Sch_chil_7 and Sch_chil_2. The F-Ratio is 11.215, with a significant value of .000. Results revealed that that the outcome is appropriate to predict. The study concludes that only two variables Sch_chil_7 and Sch_chil_2 predict the impact on India's school student education.

The value in table 4 revealed that the impact of COVID-19 is noticeable in the case of all the selected areas of Education, and school children of India and all of them are showing the impact of COVID-19 Pandemic in India.

5. Conclusion and Discussion

The above model revealed that the impact of COVID-19 is noticeable in the case of all the selected areas of Education and school children of India. This study concludes as the area that is influenced most by COVID-19 is Education. Both the educators and students face problems related to understanding technology and lack of interaction in the selected medium.

This has a very long impact on the student's future and the teaching-learning process. Educators face the impact in the form of impact on the use of technology and lack of Student interaction. School children foreseen the impact in the form of Technology is not friendly for them and no direct contact.

Further the two most significant changes in the teaching environment with the teachers to learn the use of technology so that they can impart the knowledge using the new technologies without their presence. Further, in online Education, the Students interaction also needs to be improved by making the videos, live demo, online questions asking and using the visual approach of presentation (PPT). If possible, the batch size can also be reduced to get a better attraction of the student. For school children, it is a matter of their career

and learning by using the technology can be made more user friendly. Excess use may cause problems, and better understanding can give them an extra edge. Further, their parents need to have regular monitoring for their use of the system.

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