DECLINING TREND IN EDUCATION WITNESSED DURING COVID-19 : A CASE STUDY OF 2020-2022

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Abstract

More than 82 % of students of primary education in West Bengal are dependent on Government School. When all schools remained closed for more than two years in West Bengal, most of primary school students failed to learn anything from school during those days. The poor students especially of rural areas did not have the opportunity to learn through online learning. The present study examines the effect of Covid-19 on the education of primary school children of West Bengal. The study levels an alarming situation of primary education. The study shows that a large section of students of primary schools have forgotten to solve basic mathematics and to write basic letters in their mother language. The present study is based on primary data of 750 students from primary schools in West Bengal, India. The study also confirms that during the pandemic girl students and students from village government schools were the worst hit in comparison to boys who are from city-based schools and private schools respectively.

Keywords: Covid-19 pandemic, primary education, primary school, rural, urban

Introduction

On 11th March 2020 novel COVID-19 was declared as pandemic by the World Health Organization (WHO). After March 2020 the situation of India became a dreadful scenario. Many countries realized the urge for nationwide lockdown. Many countries realized the need to seal borders and many countries restricted the movements to contain the life-threatening disease. India, a second largest country in terms of population-imposed lockdown measures since 25th March 2020 whereby stringently adhering to the social distancing norms as a prescribed precautionary principle to control and curb the monstrous virus. The rigorous

lockdown in India percolated through the economy and left devastating impact on all the aspects of the country at galloping speed. Due to the prolonged lockdown, organizations in various sectors suffered tremendous setback in first quarter of the financial year 2020–21 where people lost their livelihood, impoverished migrant workers left in precarious state and teachers with students from all levels of educational institution were at home confinement (Maity et al., 2021). Owing to the rapid mushrooming of the deadly virus across the globe people were prone to fear and anxiety coupled with uncertainty in future endeavours. In view of restructuring and reviving the economy, the central government and respective state governments have made ease with the lockdown mandates by unlocking the economic operations phase-wise. UNESCO holds that 'these nationwide closures are impacting over 90 per cent of the world's student population'.

India as a developing nation has experienced grim challenges economically with spike in the number of positive corona cases and numbered at concerning position in the world. The World Bank has drafted its warning in India Development Update (IDU) that the country is at 'risk of losing its hard-won gains against poverty'. Further, it states that many households are 'likely to slip back into poverty due to income and job losses triggered by COVID-19' (Vishnoi, 2020). During this crisis, though the Government has initiated to unlock phase-wise the economic activities that the daily wage earners are not left behind for starvation and exploitation. However, still the government is not confident to resume to normal classroom lectures in any educational institution. The teachers and students are confined at home with no scope for direct interaction between them other than virtual engagements. Unfortunately, digital accessibility is not available to all students' communities resulting in digital deprivation or digital divide. Further as per the published available data on Wikipedia, in 2019, 54.29 per cent of India's population have internet access which is lower compared to other developing countries like China 63.33 per cent, Indonesia 64.80 per cent, Brazil 71.86 per cent, Nigeria 66.44 per cent, etc.

COVID-19 is the monstrous crisis to hit globally with profound impact on the development landscape (Human Developments Reports, 2020). Due to COVID19 pandemic teaching–learning process has been disrupted and witnessed procedural transformation. This has witnessed closure of schools, colleges, universities and professional institutes in all the states ensuring the continuity of education through various available digital platforms. But in developing countries like India with low per capita income and high-income inequality, affordability of online educational system with availability of smartphone, desktop/laptop,

telecom infrastructure and internet connectivity seem to be distant dream for many. The student communities are witnessing immense challenges from the education accessibility parameter. Human touch regarded as significant dimension in developing children's intellect and learning thoughts. The budding students generally meet difficulty in expressing and sharing their problems or issues with their parents rather find ease with their friends and siblings. With limiting movements to maintain social distancing, virtual engagement has been saviour in critical hour but psychologically unable to withstand the fulfilment of their requirements. Thus, the students are undergoing high stress, monotony and loneliness as an outcome of such imposed restrictions. Due to prolonged closure of educational institutions, online teaching–learning has been the new normal trend but substantial portion of vulnerable section are debarred due to unavailability of proper infrastructure, paucity of funds, technical glitches and ignorance. Unlike the schools and colleges in villages, online teaching in metro or urban locations has geared up. Due to job loss and reduction in family income during the lockdown phase (Maity et al., 2020b); people are sceptical to spend on smartphones or highspeed internet for attending uninterrupted online classes. Further, innumerable instances of children to be out of school as their parents are sending them to work for contributing towards family income are vivid. The lockdown and school closures implemented during COVID-19 have been an onslaught on students as they are presently restricted to interact with their teachers on one-to-one basis. The structure of schools, pattern of teaching– learning and method of assessment are significantly affected during the crisis. As flipped classroom has gained momentum in India during the pandemic holds significance to assess its success story and to infer whether such initiative is paving way for students to achieve their expectations from virtual classes. The present study is therefore designed to investigate the influencing factors of e-learning on primary level students. The results of the study will motivate the administrators to implement new regulatory norms for sustainable development.

The Review in Light

Intending to curb the spread of the virus through ensuring social distancing, the Government of India has announced phase-wise lockdown in the states. The pandemic has left scars on all corners of life including education too. The students were in dilemma concerning the examination and its pattern of the current academic session. The lockdown has accelerated adherence to various digital modes for effective accessibility of the teaching–learning process without compromising the quality imparted.

According to Mishra (2020), COVID-19 induced crisis have compelled universities and higher educational institutions to shift to online mode of teaching, which has reported considerable success in such transformation. In a study, Arora and Srinivasan (2020) have analysed the impact of lockdown on the teaching–learning process.

Most of the studies reveled that COVID-19 has considerable impact on the economic graph of the higher educational institutions. Moreover, majority opined that universities in Jordan are not well-prepared strategically to manage and cope with the transformational consequences. The study highlights lack of infrastructure and absence of strategic management in the universities of Jordan to meet with uncertainties exposed. Further, Bond et al. (2018) studied the digital transformation in higher education from both students' and teachers' perspective while taking into consideration the modus operandi of the German University teachers and students on their use of technology in education. In another study, Campos et al. (2020) have reviewed on simulation-based education that aims to train students accordingly with analytical skills required while designing, implementing and using the system-based operations. Online education also has critical challenges including proctored exams (Mishra, 2020). According to Budi et al. (2020), out of total 142 respondents; 10 per cent of the sample had no laptops or personal computers, 16 per cent with no internet access and 49 per cent were unable to attend the classes due to limited capacity of different online mode and unstable internet access. Further, Arora and Srinivasan (2020) recorded that less attendance, lack of personal touch and minimal interaction due to connectivity issues are significant drawbacks of virtual mode. In another study, Moorhouse (2020) opined that trainings should be imparted to the course tutors to make them well versed in delivering lectures online. According to Qian-Hui and Ying (2020) stress was involved in the period of 'suspension of classes and non-stop learning' where teachers actively helped and extended guidance to the students. Tech-enabled learning not only counts the transformational change in online education experience but also enhances and supplements regular classroom-based pedagogy. It offers more flexibility and learning support than traditional forms (Mishra, 2020). Ponomarenko et al. (2019) have studied the trend for open access higher education online courses in Russian Universities to upgrade university's performance. In this study, authors have analysed data from Russian Universities on foreign language involving massive open online courses and developed recommendations for promotion in international market. This is consistent with the findings of Marcelo and Yot-Domínguez (2019), where the survey and semistructured interviews of teachers in Spain reveal teaching–learning processes as teacher-centric with most frequent use of digital technology

being assimilative. Likewise, the study by García et al. (2015) relates to assimilative uses of technology noticed frequently regardless of instructor's age or technical ability. The authors have identified use of technology by the university lecturers in their different respective domains at the as studying learning activities hold predominance in their learning designs. The study reveals poor integration of information and communication technology with teaching–learning processes defending such practice as teacher-centric learning activity. Teachers, using technology sparingly, limits the range of tech-driven modes. Thus, nothing surprising as the top three digital competencies found by Parkes et al. (2015) list downloading and uploading information/resources, responding reverentially to others and seeking information through one's own query. Present generation learners often referred as 'digital natives' because of their ease and familiarity with digital technology. However, the crux of the issue is adaptability of the students to the novel e-learning environment of universities. Psychologists and mental health experts speculate the impact of COVID-19 on mental health of the population with hike in cases of depression, suicide and selfharm apart from other symptoms reported globally (Moukaddam & Shah, 2020). A recent survey by Loiwal (2020) reveals that since the corona virus outbreak in India rolled out, there has been an increase of 20 per cent in mental illnesses. Psychologists have even opined that such distressful situation would have an intense global impact on psychological health of the population at large. Liu et al. (2020) studied the somatic symptoms of primary school goers and college students of Sichuan Province using somatic self-rating scale and novel questionnaire methods. The study recommends Governments and other stakeholders to initiate and implement guidelines to prevent and control mental health disorders among primary school and college students. In another study, Chang et al. (2020) analysed the state of mental health during COVID-19 crisis and the influencing factors affecting college students. According to the study, depression and anxiety are intertwined but the factors contributing to such emotions are variable in nature and the colleges felt the urge to design mental health educational sessions for college students. According to Bai (2019), Fox (2019), Khan et al. (2019), Gil (2019), Lim et al. (2019) and Romero-Rodríguez et al. (2020) use of mobile devices in educational dimension counts demand due to its self-regulating feature. With the same perception, the study of Díez et al. (2017), Alexander et al. (2019), Arain et al. (2019) and Boude (2019) indicated due to its lightness in terms of mobility, low cost, connectivity and ubiquity the device can easily be introduced in education in a short span of time. In this way learning through mobile devices contribute to transformation in teaching practice. In contrary Gay et al., (2020) pointed out the preference of students and teachers in

digital textbooks with presence of demand for print format also. After analysing results, Lall and Singh (2020) reported 74 per cent of students voted in favour of studying through online classes. The supporting statement (49%) cited the flexibility of study hours with dedicated study time as per their wish. Any co-curricular activity finds no place (34%) in online classes as reported by the students. Majority students seem satisfied with the content and procedure of online teaching and only 30 per cent of the students preferred lectures being delivered through power point presentation (PPT) with an audio recording. The study revealed that maximum students were in favour of online classes but lack of co-curricular activities in digital mode of teaching raised an alarm. Large numbers of research are available on digital teaching–learning mode in higher educational system in developed and developing countries but, however, studies on the impact of prolonged lockdown resulting in adherence to digital modes in primary level educational system remains unexplored. The stringent lockdown confines the kids at home during their normal classroom hours and the various aspects that influence e-learning for these tender age school goers have not been attempted. The new enrolled primary students who recently stepped into schools for basic foundational learning are hit hard in an unprecedented manner. The previous studies are mostly qualitative in nature with focus on implementation of online teaching–learning in academics. To elaborate, the methods resorted by the developed and developing nations in implementing digital teaching–learning and its acceptability by the stakeholders were concerning dimensions of previous studies. But in present scenario the world being posed to distinct challenges with regulatory norms of home confinement to contain the deadly virus and the educational institutions required to implement digital teaching methods to engage students in routine classwork, timely course completion and relaxing the stress level of the kids by assigning regular homework. As a result of such situation, the teachers and students may be the first-time users of digital educational tools with major challenges in sharing knowledge. Unlike the previous theoretical and conceptual studies, the present empirical study attempts to sketch the impact of flipped education on primary school students in COVID-19 pandemic. Objective and Hypothesis of the Study The monstrous corona virus disease has grasped the stability across all sectors around the globe. The current crisis witnesses high stress whereby anxiety levels up among the population (World Health Organization, 2020). Though the students are at home confinement but unable to concentrate on studies to keep pace with the online classes. Based on previous discussion and research objective, the first Null Hypothesis (H01) is that the selected factors considered in this study does not hold any

significance in influencing digital learning of primary level students and the second Null Hypothesis (H02) is that there is no significant difference.

Data and Research Methodology Sample Design

The study was conducted among the primary data of primary students of class I–V. The study takes into account 1000 students with 500 boys (50%) and 500 girls students (50%) with total 200 students from each Class. Among 200 students from each class, 100 students (50%) are from city-based schools and 100 students (50%) from village schools. The selected city and village regions include Kolkata, Howrah, Paschim Bardhaman, Purba Bardhaman, Purulia districts in West Bengal. The data collected directly from students in presence of their parents. From total 1000 students; 250 students (25%) are from private schools and 750 students (75%) are from government schools. Due to less number of private schools in villages, the number of students is comparatively less than government schools in the sample. The design of the sample is represented in Table 1. The questionnaires framed in unambiguous language for primary level students to answer easily without any ambiguity. The structured questionnaires are collected during February, 2021 to April, 2021 by maintaining proper social distancing norms.

As per Saunders et al., 2009, the larger is the sample size, the greater is the representativeness of the sample with more reliability of results. The study uses Cochran's formula for determination of the sample size. According to Cochran's (2007) formula, for an infinite population the calculation for representative sample is as follows:

$$n_0 = \frac{Z^2 p\ q}{e^2}$$

In the above equation, n_0 represents sample size, Z represents to selected critical value of desired confidence level, p denotes estimated proportion of an attribute present in the population while q = 1 − p and e implies desired level of precision. Based on the above Cochran's formula, 920 respondents is adequate at 99 per cent confidence level. However, to achieve robust result the study intends to collect data primarily from 1000 primary students as respondents through random sample method (based on effectiveness and bias free)

Table 1.

Category	Number of students from each class	Total students	Students %
Students from City School	100	500	50
Students from Village School	100	500	50
Boys' Students	100	500	50
Girls' Students 1	100	500	50
Students from private School	100	250	25
Students from Government School	100	750	75

Total (N)	200	1000	100

Variables Used in the Study

The present study relates to investigate the effect of covid -19 pandemic on the primary school students during February, 2021 to April, 2021. During the lockdown phase it was evidenced that a large section of students failed to learn basic education. The students can read and write Bengali or English Language were our dependent variable. Binary variable 1 (one) assigned for read and write Bengali or English language by pupils and 0 (zero) unable to read and write Bengali or English language. Total 6 independent variables considered and all are binary variables. The binary variables considered are given in the Table 2 as shown below.

Table 2. Summary of the Explanatory Variables

Name of the Variables	Notations	Measurements
The school is located in city or village	COV	1: city 0: village
Private or government school	POG	1: private 0: government
The students can read Bengali or English language	LAN1	1: read Bengali or English 0: can not read Bengali or English
The students can write Bengali or English language	LAN2	1: write Bengali or English 0: can not write Bengali or English
The students can read Digits	DIG1	1: read digits 0: can not read digits
The students can write Digits	DIG2	1: write digits 0: can not write digits

Statistical and Econometric Tests Used

To identify the effect of covid-19 pandemic on primary school students, binary logistic regression was used. Logistic regression refers to regression model with categorical dependent variable and output takes two values '0' and '1' referred as binary logistic regression or logit model. Total 1000 primary students from Class I to V have been accounted from selected regions. In Logistic Regression Model, estimation made according to maximum likelihood estimate. A logistic model has flexibility of incorporating both qualitative and quantitative factors and is more effective and accurate than linear regression probability model. The study estimates coefficient with the following equation:

$$X_i = \log \frac{p_1}{1 - p_1}$$

$$= \alpha + \beta_1 . COV + \beta_2 . POG + \beta_3 . LAN1 + \beta_4 . LAN2 + \beta_5 . DIG1 + \beta_6 . DIG2 + e_i$$

Pi = probability that dependent variable accepts value of 1 (i.e., students have attended virtual class). $1 - \text{Pi}$ = probability that dependent variable accepts value of 0 (zero). where α represents intercept in the model, β_i is coefficient of ith independent variable and ei is error term.

Variance inflation factor (VIF) is used here to test multicollinearity property. Goodness of fit of the model has been verified by Hosmer–Lemeshow test. We have used Welch's t-test to investigate significant difference in various dimensions as city- and village-based school students, private school students and government school students. The test is more accurate than t-test when variances or sample size are unequal. We assume unequal variances and then the test statistic is calculated as follows:

$$W = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$$

The degree of freedom (d.o.f.) is calculated by

$$d.o.f = \frac{\left(\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}\right)^2}{\left|\dfrac{\left(\dfrac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \dfrac{\left(\dfrac{s_2^2}{n_2}\right)^2}{n_2 - 1}\right|}$$

where $\overline{X_1}$ = mean of first sample; = $\overline{X_2}$ = mean of second sample,

s_1^2 = variance of first sample, s_2^2 = variance of second sample; n_1 = sample size of first sample , n_2 = sample size of second sample and W = Welch's t-test. We have used ratios, mean, standard deviation to analyse the data. Before analysing data, reliability has been verified with Cronbach's coefficient alpha.

Analysis and Discussions

In the wake of COVID-19 pandemic Indian Government imposed rigorous lockdown throughout whole India. The Covid-19 pandemic caused a long-term implication on the educational system of West Bengal disrupting largely on primary education. During prolonged lockdown the educational institutions had to shut down for more than two years. This prolonged lockdown affected the primary education of West Bengal especially in village school children. The village school students did not have any opportunity learn from private tuition as their guardians have generally low per capita income. Ultimately students from all levels of educational institution are posed to diverse challenges. Before analysing data, we have checked

the reliability of data. The data collated analysed by econometric model with inference. Considering various challenges during lockdown we have investigated the effect of prolonged lockdown in India on primary school students. Initially we have considered and analysed logistic regression model. In order to describe data property, the study measures mean and standard deviation in Table 3. We have verified reliability with Cronbach's coefficient alpha. The value worked out to 0.754 clearly establishes the reliability of the test (George & Mallery, 2003). We know from theories of reliability that when this value is above 0.5, the test is reliable and when it is below 0.5, the test becomes inappropriate. Before using logistic regression, it was checked if there exists any multicollinearity among explanatory variables in terms of VIF. The same is represented in Table 4 and mean VIF is 3.867, which is even less than 5.

Table 3. Descriptive Statistics

Variable	Observations	Mean	Standard Deviation
COV	1000	0.500	0.475
POG	1000	0.515	0.488
LAN1	1000	0.459	0.494
LAN2	1000	0.488	0.465
DIG1	1000	0.433	0.472
DIG2	1000	0.486	0.436

Table 4. Cronbach's Alpha and VIF Statistic

Factor	Cronbach's Alpha	VIF	I/VIF = Tolerance
COV	0.754	6.432	0.183
POG	0.754	4.219	0.211
LAN1	0.754	2.562	0.342
LAN2	0.754	2.853	0.394
DIG1	0.754	3.451	0.517
DIG2	0.754	3.682	0.498

Mean VIF= 3.867

The present study shows various facts with figures considering primary students from villages as well as from towns of West Bengal. Undoubtedly, the findings of the study have several significant implications that require immediate address from government's end to regulate examination of the current academic year that in turn would be beneficial for new academic session. Further with the application of Welch's t-test comparative study conducted between village and city primary school students. A comparative analysis has been conducted based on gender discrimination in government school and private school students. This test is more accurate in comparison to 't' test in situation of unequal variances. According to Welch's

t-test, there lies significant difference between city and village school primary students and private and government school students (Table 5).

Table 5. Result of Welch's t-test

Null Hypothesis (H₀)	Parameter	N	Mean	S.D.	t-test	Degrees of freedom (D.O.F)	P values	Result
There is no significant difference of Education of primary School students in government or private school in villages	Village	500	0.316	0.471	W=7.346	878	0.00	H₀ is rejected
There is no significant difference of Education of primary school students in government or private school in cities	City	500	0.452	0.327	W=8.847	886	0.00	H₀ is rejected
There is no significant difference of knowledge in language before and after lockdown in West Bengal of primary school students in government or private school in villages	village	500	0.353	0.492	W=7.932	882	0.00	H₀ is rejected
There is no significant difference of knowledge in language before and after lockdown in West Bengal of primary school students in government or private school in cities	City	500	0.488	0.421	W=8.632	888	0.00	H₀ is rejected
There is no significant difference of knowledge on digits before and after lockdown in West Bengal of	village	500	0.323	0.488	W=7.812	884	0.00	H₀ is rejected

primary school students in government or private school in villages							
There is no significant difference of knowledge on digits before and after lockdown in West Bengal of primary school students in government or private school in cities	City	500	0.412	0.352	W=8.874	881	0.00	H_0 is rejected

Conclusion

The global crisis caused by corona virus has raised alarming concerns about its long-lasting impact on education especially on primary education in West Bengal. The socio-educational approach of schools, colleges and universities have been drastically affected by COVID-19 pandemic. The chalktalk teaching model has undergone transformation while digital model for ensuring continuity of teaching–learning process is in vogue. The pandemic has transformed learning pattern of students, compelling them to adjust and adapt to studying in isolation and sharing knowledge online. But online teaching and learning process failed to fulfil the teaching learning as was before pandemic. In this study, an effort has been made to determine the effects of Covid-19 pandemic in primary school students of both government schools and private schools, village schools and city schools. The results have shown that there is a drastically decline of education in primary school students both in the city school as well as in the village schools. Thus, the rural students are not much benefited from e-learning solutions. The education sector as critical determinant of the country's economic future suffered significant disruption in the well-sketched system as turbulent effect of the pandemic.

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