



A Study of Problems and Challenges of ICT Enabled Online Education during the Covid -19 Situation: A Case study of West Bengal State University

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Abstract: Information and Communication Technology (ICT) in education is a form of education that uses technology to support and improve information delivery. ICT is contemporary model which has combined in many streams and is an essential portion of teaching learning process. A teacher has faced numerous challenges while trying to conduct ICT enabled online classes and imparts lectures during the pandemic ever since the teaching was shifted from offline to online mode. Covid-19 has created several crises for students and academicians alike who are still groping in the dark and trying to cope with newer teaching-learning methods, methodologies, tools and concepts. This appears more like a quest since the acquaintance with the virtual world is largely a matter of confusion and doubt for many. The pandemic situation has made certain sudden demands on humanity and unlike corporate houses who deal on both ends of the spectrum of the virtual world with mature adults; the educational institutions have more difficult and complex tasks in hand. Learners accustomed to the realities of the physical classrooms, teachers' voices, lunch-break, jostles and friendly chatter are hurled into complex teaching-learning ambience where the teacher is a remote image and removed from the familiar spaces.

The purpose of this paper shall be to highlight the numerous possibilities that lie in the process of delivering and receiving knowledge and of embarking upon latest technical knowhow that may aid in making educational resources available to all categories of students viz. advanced, mediocre or weak, urban or rural, in the hope that the pandemic may neither deprive any learner of her/his right to education nor create any anxiety in the manner and mode of learning. This research discusses the various challenges faced by teachers while taking online classes and handling the challenges faced by the students in order to cope up with the new learning process. The technically challenged students of remote area of the colleges under West Bengal State University faced number of constraints in learning through online sessions.

Keywords: Information Communication Technology, Technological Challenges, Online Tools, Online Learning Courses, Virtual World.

I. INTRODUCTION

The corona virus disease 2019 (COVID-19) was detected in China in December 2019, spread throughout the world within a few months and was declared a pandemic by the World Health Organization on 11th March 2020. The campuses of colleges and Universities closed in 2020 throughout the globe and shift all their academic programs online (Bao, 2020). Universities were not prepared for such a transition from classroom-based education to completely online education. Infrastructures and strategies of colleges and Universities were not ready to on go this sudden shift (Zhang, Wang, Yang, & Wang, 2020).

This paradigmatic shift of education from offline to online mode operates more differently for the sections of students occupying the rural or semi-urban sections. The routine for online teaching was framed immediately to avert the constraints of teaching break for the college students under different Universities. Faced with an economic crunch, many parents too refused to allow their children to avail themselves the benefits of such programs since these programs require internet services. While the western methods of teaching-learning have long adjusted to the on-line mode (Covid or no Covid) in their curriculum and education, the Indian or the sub continental processes are still to accept such methods. Explaining to students of the immediacy of attending on-line classes has itself posed several challenges. The teacher is often faced with a problem of having complete control over her/his students since their body language or facial expressions are not always possible to view.

Under such circumstances, the patience of teachers and learners is put to test, if not serious trial. Learners need to adjust to faster teaching processes and teachers need to explore better or efficient teaching practices.

There has been a lot of advances in educational technology in the last few decades and the same proved to be immensely useful during this pandemic (Chatterjee & Chakraborty, 2020; Dhawan, 2020). Several ICT based online platforms to support online education were available (Nash, 2020). Nevertheless, it was a challenge for universities to map their educational activities in an online space. Additionally, teachers and students faced a wide range of logistic, technical, financial, and social problems (Lassoued,



Alhendawi, & Bashitialshaaer, 2020; Peters et al., 2020). The mental health of many students around the world has been affected during the pandemic and the lockdowns. Students have been suffering from stress, strain and anxiety (Cao et al., 2020; Islam, Barna, Raihan, Khan, & Hossain, 2020). Such psychological issues often hinder students from adapting to online education. Moreover, not all students have equal access to and expertise on, digital technologies.

West Bengal State University is a reputed University in West Bengal, India offering undergraduate and post graduate programs in different disciplines of Science, Social Science, Commerce and Management, etc. The university has different colleges under it located in different areas of urban, semi urban, rural as well as remote areas. The university suspended regular classes from March 2020 as a nationwide lockdown began in India on 25th March 2020. The academic programs of the university are based on intense classroom, laboratory-based as well as field based activities. It was too difficult to move all these academic activities online immediately. Initially it was assumed that the situation will normalize within a few days and the campuses could be reopened. As a temporary measure, teachers recommended students to join free online learning courses. FOLC which are ICT aided and study from the assignments, lecture notes etc given by them via e-mail and whatsapp. But, as lockdown kept on expanding and the pandemic was threatening the lives of mankind, university strategized its teaching-learning process and the academic activities were moved onto an online platform. The teachers and students of the university gradually adapted to the scenario. The intense use of Google Classroom and Blackboard to dispense course material, give assignments and information related to their courses was done to do all the pre and post class activities. This allowed the teachers to share notes and multimedia resources related to their courses with students. But they started to deliver live lectures and discussion sessions through Google Meet, Zoom meet, etc to do all the in class activities. Additionally, the teachers are taking help of virtual laboratories to teach science courses (Jain et al., 2018; Ray & Srivastava, 2020).

Furthermore, depending on the nature of their courses, various ICT based online tools have been used to support problem solving, programming, and designing activities in order. The opinion on online education during the COVID-19 pandemic of undergraduate students of different colleges of the University is surveyed and studied. The perception of the students on content delivery, interaction in online education and the health and social effects is surveyed in this field study report. A survey has been conducted in which undergraduate students of different colleges of West Bengal State University have been asked about their opinion on different aspects of ICT enabled online education during the ongoing pandemic. Huge responses have been received from 358 students. The students felt that they learn better in physical classrooms (65.9%) and by attending free online learning courses (FOLC) (31.6%) than through online education. The students, however, felt that the professors have improved their online teaching skills since the beginning of the pandemic (68.1%) and online education is useful right now (77.9%). The students appreciated the ICT based software and online study materials being used to support online education. However, the students felt that online education is stressful and affecting their health and social life.

II. MATERIALS AND METHODS

To conduct the study there should be a proper approach. On the basis of Research approach two approaches- Psychological Study through Questionnaire and data analysis has been made.

A. Psychological Study through Questionnaire

A questionnaire with 20 statements related to ICT based online education during the COVID-19 pandemic was prepared to analyse the psychological aspects of the undergraduate students. A student had to respond to each statement on a 5-point scale where a score of "1" represented "Strongly disagree" and a score of "5" represented "Strongly agree." The statements were related to the teaching-learning process in general, content delivery, teacher-student interaction, assessment and health and social impact of online education.

TABLE II THE QUESTIONNAIRE

Practical issues	
PI1	Teaching-learning is better in offline physical classroom mode compared to online education.
PI2	FOLC is better compared to Online education.
PI3	Improvement in online teaching skills of teachers since the beginning of the COVID-19 pandemic till date.
PI4	Online education is the only alternative during the COVID-19 pandemic situation.
Issues related to direct teaching	
DT1	Availability of adequate study materials in online classrooms.
DT2	PPT presentations and video lectures make a lecture more informative.

Familiar interactions and data analysis was done by interacting with students through asking questions to compare online education



with physical classroom-based education (PI1) and FOLC (PI2). Questions were made regarding improvement of teaching abilities of teachers since the beginning of the pandemic (PI3) and online education, the alternative in the current pandemic circumstances (PI4). Other questions regarding availability of enough online resources (DT1), and if the courses can be enriched by PPT presentations, video conferencing (DT2), assignments (DT3), and more specialized online tools for problem solving, programming, and designing (DT4). A series of questions were asked to the students regarding their interaction with teachers in a physical classroom than through online education (TL1). Could the use of digital pen by teachers improve the knowledge of students (TL2). Is it necessary to show the faces of the teacher and students while interaction (TL3). How effective is questions in chat box by students (TL4) during the lectures. Other interrogations regarding online tests and questioning (OA1), assignments and examinations (OA2) were made.

Health issue related questions (HI1, HI2, HI3, HI4) effecting the physical as well as mental health of the students as a result of online education were asked. Finally, the students were asked if online education is affecting their daily life (SI1) and imposing financial challenges (SI2). The questionnaire was sent to 387 undergraduate students of different colleges under West Bengal State University through Google forms and their responses were recorded continuously.

TL1	Teaching-learning Interaction between teachers and students takes place better in physical classrooms than through online platforms.
TL2	Use of a digital pen makes a lecture more interactive.
TL3	Keeping the audio-video in 'on' mode of a teacher and students make the interaction more user friendly.
TL4	If the teacher allows the students to post comments in the chat box during a lecture, then it becomes interactive.
Online Assessment	
OA1	Online tests and Questioning effectively evaluate the knowledge of students.
OA2	Weekly assignments and monthly tests help in the learning process.
Health issues	
HI1	Phobia of internet connectivity may hamper Online education especially in remote areas.
HI2	Overuse of Internet connectivity may cause a financial constraint among students.
HI3	Excessive screen time is causing owl disease in students.
HI4	Online assessment creates more anxiety than traditional forms of assessment.
Social issues	
SI1	Online education is affecting the daily life of students and their families, particularly the first generation learners.
SI2	Online education is demanding more technological devices and internet issues which are very expensive for financially challenged section of students.

III. DATA ANALYSIS

The correlation and covariance between the different aspects of online education were analyzed. Further, a model was constructed to examine the influence of the different aspects of online learning on the social issues related to online education. A least square analysis method was used to evaluate the model.

IV. RESULTS AND INTERPRETATION

The responses from 358 students were recorded. The mean age of the respondents was 20.09 years ($SD: 1.13$). Out of the respondents, 34 (9.5%) were female and 324 (90.5%) were male. The students had a mixed opinion about ICT based online education during the COVID-19 pandemic. A majority of the students (65.9%) felt, that is, agreed or strongly agreed, that learning takes place better in physical classrooms than through online education and only a minority of the students (31.6%) felt that online education is better than attending FOLC. Nevertheless, the students felt that teachers have improved their online teaching skills since the beginning of the pandemic (68.1%) and online education is an alternative in the current circumstance (77.9%).

TABLE III RESPONSES



Indicator	Percentage of respondents					Mean score	
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD
PI1	4.7	8.7	20.7	31.0	34.9	3.827	1.142
PI2	14.5	25.4	28.5	20.1	11.5	2.885	1.219
PI3	3.9	7.5	20.4	36.0	32.1	3.849	1.077
PI4	3.4	4.7	14.0	30.7	47.2	4.137	1.043
DT1	3.1	5.9	17.3	29.3	44.4	4.061	1.062

Indicator	Percentage of respondents					Mean score	
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD
DT2	4.7	13.1	23.5	29.9	28.8	3.648	1.164
DT3	1.4	6.7	22.9	30.7	38.3	3.978	1.004
DT4	1.7	4.2	22.1	34.9	37.2	4.017	0.955
TL1	3.6	7.8	13.4	21.2	53.9	4.140	1.139
TL2	2.5	4.2	13.1	33.0	47.2	4.182	0.983
TL3	14.8	20.9	28.2	20.9	15.1	3.006	1.272
TL4	3.4	4.5	15.9	42.2	34.1	3.992	0.992
OA1	14.0	13.4	24.6	31.0	17.0	3.237	1.278
OA2	11.2	14.5	29.1	30.4	14.8	3.232	1.200
HI1	6.1	8.9	19.0	28.8	37.2	3.818	1.201
HI2	2.5	6.4	8.4	23.2	59.5	4.307	1.035
HI3	5.3	7.5	12.6	24.3	50.3	4.067	1.186
HI4	11.2	16.5	18.2	19.3	34.9	3.503	1.398
SI1	6.7	8.4	17.0	29.6	38.3	3.844	1.213
SI2	5.3	7.3	23.7	30.4	33.2	3.791	1.139

The students appreciated the online resources and tools being used by the teachers to disseminate information. The students (71.7%) felt that adequate study material is now available online. The students also felt that PPT presentation, video conferencing improve teaching learning (55.7%) and assignments improve knowledge (65.2%). The students (73.1%) felt that online tools for problem solving, programming, and designing can enrich courses.

The students expressed how they thought lectures can be made more interactive. The students (75.1%) felt that they can interact



better with teachers in a physical classroom. The students (81.2%) felt that teachers can make lectures more interactive using devices like a digital pen. Interestingly, only 36.0% students felt that the interaction can improve if teachers and students show their faces during lectures. The students (73.3%) felt that communication between teachers and students through chat box during lectures will make them more interactive. Only 48.6% students felt that online assessments can properly evaluate their knowledge and 44.2% students felt that regular tests facilitate the learning process.

The students felt that online education is affecting their health. Nearly 63.8% students felt that online education is causing phobia of losing internet connectivity among them. A large majority of the students (81.7%) felt that online education is leading to overuse of digital technologies and challenging their financial conditions. 72.6% students felt that excessive screen time is causing stress and affecting their sleep. The students (58.2%) also felt that online assessment causes more anxiety than traditional forms of assessment. The students also felt that online education has societal implications. 66.9% students felt that online education is affecting their daily life and 64.6% students felt that online education is demanding more technological devices and internet issues which are very expensive for financially challenged section of students.

V. DISCUSSIONS

The collected opinion of students during the COVID-19 pandemic through questions and discussions reflected that physical classrooms are difficult to replicate on an online platform. The comparisons are somewhat uneven. However, online education can be better personalized because of smaller class size and homogeneous background of the students.

While many significant developments have been made within this last year or so regarding the process of conducting online classes but there is a requirement of dialogue on the issue of technology in terms of ICT. While we must admit that there is a long way to go for us before we adopt a completely online mode of teaching but we can take baby steps towards the goal. These technologies are of course costly today but with time they might be available at cheaper costs, especially, when they could be bought in massé.

VI. CONCLUSION

Online education has been on the fringe for a long time. The COVID-19 pandemic made it the mainstream. A survey was conducted to know the opinion of undergraduate students in different colleges of West Bengal State University on different aspects of online education during the COVID-19 pandemic. It was found that the students considered online education a viable alternative under the current circumstances. There is scope for improvement of teachers to make ICT enabled online education better acceptable among students. The network issues area major hindrance in smooth conduction of classes.

The COVID-19 pandemic has led to adoption of ICT enabled online education on a large scale around the world for the first time. There is a need to train faculty on the use of online modalities and developing lesson plan with reduced cognitive load and increased interactivities.

REFERENCES

- [1] S. M. Metev and V. P. Veiko, Laser Assisted Microtechnology, 2nd ed., R. M. Osgood, Jr., Ed. Berlin, Germany: Springer-Verlag, 1998.
- [2] J. Breckling, Ed., The Analysis of Directional Time Series: Applications to Wind Speed and Direction, ser. Lecture Notes in Statistics, Berlin, Germany: Springer, 1989, vol. 61.
- [3] S. Zhang, C. Zhu, J. K. O. Sin, and P. K. T. Mok, A novel ultrathin elevated channel low-temperature poly-Si TFT, IEEE Electron Device Lett., vol. 20, pp. 569–571, Nov. 1999.
- [4] M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, “High resolution fiber distributed measurements with coherent OFDR,” in Proc. ECOC’00, 2000, paper 11.3.4, p. 109.
- [5] R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, “High-speed digital-to-RF converter,” U.S. Patent 5 668 842, Sept. 16, 1997.
- [6] W. Bao, COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, vol. 2(2), pp. 113–115, 2020.
- [7] W. Cao, Z. Fang, G. Hou, M. Han, X. Xu, J. Dong and J. Zheng. The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Research, vol. 287, pp. 112-134, 2020.
- [8] I. Chatterjee and P. Chakraborty. Use of information and communication technology by medical educators amid COVID-19 pandemic and



- beyond, *Journal of Educational Technology Systems*, 2020
- [9] S. Dhawan. Online learning: A panacea in the time of COVID-19 crisis, *Journal of Educational Technology Systems*, vol. 49(1), pp. 5– 22, 2020.
- [10] M.A. Islam, M. S. D. Barna, H. Raihan, M.N.A Khan and M.T. Hossain. Depression and anxiety among university students during the COVID- 19 pandemic in Bangladesh: A web-based cross-sectional survey. *PloS One*, vol. 15(8), pp. 162, 2020.
- [11] D. Jain, P. Chakraborty and S. Chakraverty. Smartphone apps for teaching engineering courses: Experience and scope. *Journal of Educational Technology Systems*, vol. 47(1), pp. 4– 16, 2018.
- [12] Z. Lassoued,, M. Alhendawi and R. Bashitialshaaer. An exploratory study of the obstacles for achieving quality in distance learning during the COVID-19 pandemic. *Education Sciences*, vol. 10(9), pp. 232, 2020.
- [13] C. Nash. Report on digital literacy in academic meetings during the 2020 COVID-19 lockdown. *Challenges*, vol. 11(2), pp. 20, 2020.
- [14] M.A. Peters, H. Wang, M.O. Ogunniran, Y. Huang, B. Green, B, J. O. Chunga, J and S.W. Khomera. China's internationalized higher education during COVID-19: Collective student autoethnography. *Postdigital Science and Education*, 2(3), 968– 988, 2020.
- [15] P. Chakraborty, P. Mittal, M.S. Gupta, S. Yadav, and A. Arora. Opinion of students on online education during the COVID-19 pandemic. *Wiley, Hum Behav & Emerg Tech*, pp. 1–9, 2020
- [16] S. Ray and S. Srivastava . Virtualization of science education: A lesson from the COVID-19 pandemic. *Journal of Proteins and Proteomics*, vol. 11(2), pp. 77– 80, 2020.