Critical Perspective Analysis of Higher Education Studies in the Online Mode – Emerging Challenges and Solutions

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Abstract

Many academic institutions that had previously hesitated to modify their old pedagogical method had to opt for completely online modules due to the COVID-19 global pandemic. This paper provides insight into the perception of students of higher education concerning the online mode of learning. Data was collected from 310 students pursuing different courses. A questionnaire, divided into 7 sections was administered including: general information of students, time management, understanding of course content, view of students on assignments and submissions, ease and comfort of study, skill development and motivation, and course satisfaction. The data was analyzed quantitative analysis. Results showed that 72.4% of students do not prefer the online platform for learning and this view is contributed by parameters like net connectivity, time, overall development of the candidate and evaluation of the course outcomes. Various parameters such as internet connectivity, parallel data users, unwanted anxiety, extra time, comfort, understanding of the concepts, interaction, information absorption and retainment, course evaluation and assignments, expense comparison, skill development, lecture participation and extracurricular growth were mentioned. It is suggested that an alternative to classroom learning must be used to maintain one's academic progress.

Keywords: academic crisis, higher education, Online learning, SARS-Cov-2, student's perception

On 11 March 2020, the World Health Organization (WHO) declared a Global Pandemic (COVID-19) (Cucinotta & Vanelli, 2020). As a result, various lockdowns were introduced in India after 22nd March 2019 (Soni, 2021). As a result, education institutions were forced to remain closed until the situation was normalized. Therefore, it is no longer a question of whether online education can deliver excellent university learning and if universities can rapidly and efficiently include online study. Education in India is estimated to run into billions of dollars, there are overall 39,913 colleges and 993 universities in India respectively in FY19, having 37.4 million students enrolled in higher education (*Education & Training Sector in India: Education System, Growth & Market Size | IBEF*, n.d.). Hence, students are one of the most valuable resources of India, and their education cannot be stopped because of the COVID-19 pandemic. In contrast, overseas institutions like the Massachusetts Technology Institute (MIT), Harvard University and Yale University Students Free Yale Open Classes prefer a range of different platforms for online courses, including edX.org. According to the Indian Private Equity and Venture Capital Association (IVCA) and PGA laboratory, Indian start-ups have made a total investment of $2.22 billion in 2020 compared to $553 million in 2019 (*Indian Edtech Startups See Investment of $2.22 Bn in 2020, Shows Data | Business Standard News*, n.d.). These online platforms have now become the new normal for most. Also, India is one of the 8 countries leading in online providing education via online platforms (*8 Countries Leading the Way in Online Education - ICEF Monitor - Market Intelligence for International Student Recruitment*, n.d.). The online learning method has its challenges and strengths, but they keep education going.

Literature Review

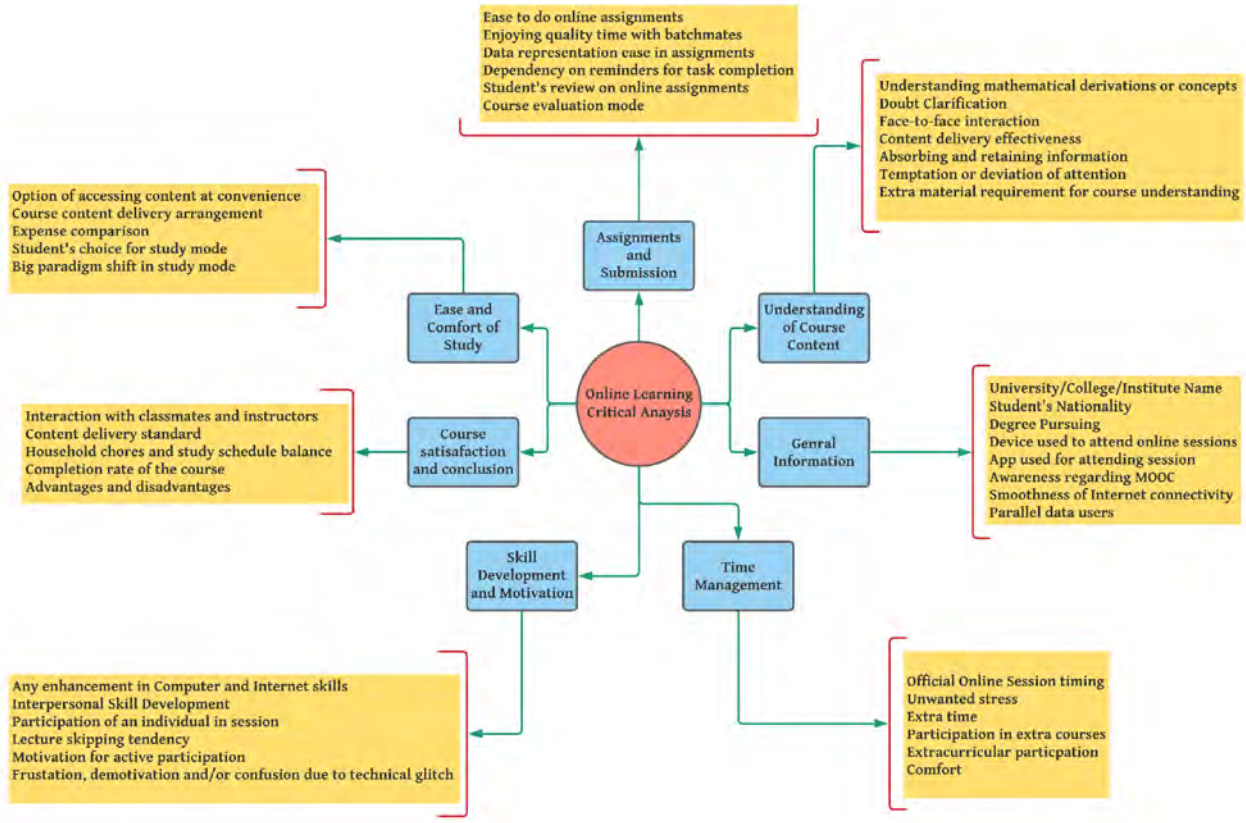
The Government of India also undertook other efforts, such as the National Open Educational Resources Department (NROER), which exposes students to e-libraries, e-books, electronic courses and statistical other online events. In addition, the Department of Human Resources Development offers a DIKSHA portal, and an e-Pathshala website for students to access numerous study resources online. The SWAYAM Portal, a Government of India project coordinated with AICTE, NCERT, IGNOU, UGC, NPTEL, NIOS, IIMB, NITTR and CEC, delivers latest and high-quality content (*Government Facilitates E-Learning Platforms for Students amid COVID-19 Outbreak | Digital Learning Platforms*, n.d.). This allows students several preferences such as asynchronous and synchronous learning techniques (Malik et al., 2017). The analyses of data of 45 students from three schools in Shah Alam, Selangor demonstrate that e-learning provides more flexibility to teacher-led and student-self-study courses (Luaran et al., 2014). Experimental design has been performed to research the success of 10th-grade physics students in online and face-to-face (F2F) education. The study shows that the success of students who have been taught F2F has been considered poor because the learning process is confined to co-operation and resource sharing in classrooms, but online education allows better interaction (Baig, 2011). Furthermore, research in higher educational institutions illustrates how the methods of measurement and implementation used will affect online curriculum performance and the advantages and constraints faced through e-learning (Xu, 2007). Also, research including 127 students enrolled in the Bilgi University eMBA Master's degree, examined interactions between personality and academic accomplishments of learners in a web-based world and web-based education attitudes with positive findings revealing that behavioural characteristics reflect roughly 53.2% of academic achievement and 52.7% of web-based education attitudes (Bayram et al., 2008). The study revealed that the results of online courses have increased positively for students who engaged in interactive learning methods, and was structured to promote the development of the learner population. (Benbunan-Fich & Hiltz, 2003). Another study established four broad e-learning categories: (1) the supply and delivery through electronic means of an educational, training and education

curriculum; (2) communication-oriented - interactive resource and content learning requiring interaction through online contact with the learner and the teacher; (3) technologically-based - technical use of training and learning services technology; and (4) pedagogical - information and communication technologies to assist students in developing their education (Albert Sangra et al., 2012). Conversely, a study conducted on exploring how students enrolled in a professional writing class in two web-based portions are rated relative to students enrolled in a traditional class edition showed no substantial difference in student success (Mehlenbacher et al., 2000).

Methodology

Primary data was collected from 310 students with experience of online learning. A survey was designed and divided into various sections. Section A comprised 8 questions with general student knowledge, Section B comprised 6 time management questions, Section C contained 6 questions to understand the substance of the course, Section D contained 6 tasks based and submission questions; Section E comprised 5 study-oriented questions; Section F comprised 6 skill growth and motivation-oriented questions, and Section G contained 5 questions based on the satisfaction and conclusion of the course. The questionnaire was circulated via Google forms and the responses were later analyzed. The period of analysis and questionnaire formation was March 2021. The respondents were given information regarding the purpose of the survey while collecting the data. Data mining is a new way of analyzing data, especially for very large datasets. Data mining can also be done with the help of Microsoft Excel (Hewen, 2008). Various aspects of statistics such as the measure of spread and measure of central tendency were analyzed using Microsoft Excel (Divisi et al., 2017). Static indices applied to the first four moments of the distribution summarize the most critical frequency distribution features such as *mean*; *variance*; *skewness*; and *Kurtosis* which is sometimes used incorrectly to represent "peakedness," which actually reflects deviations from the standard curve (Hopkins & Weeks, 1990). The mean is given as a central trend measure and the variance or standard deviation as a variability measure in traditional study reporting. Hence, such quantitative statistical analysis has been provided, apart from data representation as well as data analysis and interpretation into the results section.

Figure 1
Different Aspects of Online Learning and its Critical Evaluation



Results and Discussion

Section A: General Information

Question 1: Please enter our University/College/Institute name.

Table 1

Details of the Number of Respondents from each University/College/Institute

University	Respondent	Percentage
Anand Agricultural University	238	67.81
Gujarat Technological University	52	14.81
Universiti Malaysia Perlis	6	1.71
Georgian College	5	1.42
Chittagong University	4	1.14
Pandit Deendayal Energy University	4	1.14
Erbil Polytechnic University	3	0.85
Ludwig Maximilian University	3	0.85
Gujarat University	2	0.57
University of Amsterdam	2	0.57
SRM University	2	0.57
Birla Vishvakarma Mahavidyalaya	2	0.57
Visvesvaraya Technological University	2	0.57
Maharaja Sayajirao University (MSU)	2	0.57
Kadi Sarva Vishwavidyalaya	1	0.28
Ternopil National Medical University	1	0.28
Vellore Institute of Technology	1	0.28
University of Tehran	1	0.28
Tribhuwan University	1	0.28
Charotar University of Science and Technology	1	0.28
Dharmsinh Desai University	1	0.28
Ahmedabad University	1	0.28
University of Copenhagen	1	0.28
Banda University of Agriculture and Technology	1	0.28
Sam Higginbottom University of Agriculture, Technology and Sciences	1	0.28
Uttar Banga Krishi Vishwavidyalaya	1	0.28
University of York	1	0.28
University of Derby	1	0.28
University of Business and Economics	1	0.28
Rajasthan University	1	0.28
Kishinchand Chellaram College	1	0.28
American International University	1	0.28
National Institutes of Technology, Rourkela	1	0.28
Shahjalal University of Science & Technology	1	0.28
International Islamic University Chittagong	1	0.28
Marwadi University	1	0.28
Catholic University of the Sacred Heart	1	0.28
University of California	1	0.28
Total	351	100.00

Question 2: Please select your country, dependency, or territory.

Table 2
Details of Respondent's Nationality

Country	Respondents	Percentage
India	310	88.32
Bangladesh	11	3.13
Malaysia	6	1.71
Canada	3	0.85
Iraq	3	0.85
Germany	3	0.85
Netherlands	2	0.57
Bhutan	2	0.57
Nepal	2	0.57
United Kingdom	2	0.57
Denmark	1	0.28
Iran	1	0.28
Italy	1	0.28
Philippines	1	0.28
Slovakia	1	0.28
Ukraine	1	0.28
Afghanistan	1	0.28
Total	351	100

As per the survey, 88.32% of students were Indians and the rest 11.68% were international students as shown in table 2.

Question 3: Please share which degree are you pursuing at present?

Table 3
Details of Degree/Course Pursued by the Respondent

Education	Respondents	Percentage
Degree Engineering	190	54.13
Bachelor of Science	101	28.77
Diploma Engineering	22	6.27
Arts	12	3.42
Masters of Science	10	2.85
Commerce	7	1.99
PhD	4	1.14
Medical	3	0.85
Master of Arts	2	0.57
Total	351	100

Question 4: How do you attend the online sessions?

The study also highlights the way students engage in these online learning processes, which play a significant role in the experiences. A total of 74.9% of students accessed classes from the smartphone, 21.4% of students attended it from the laptop, 2.8% from tablet and only 0.9% of students accessed it from laptops. Mobile usage can increase distractions that can be avoided using tablets otherwise.

Question 5: Which app is used by your Institute to deliver contents/online sessions?

Table 4
Details of the App Used to Access the Content

App	Respondents	Percentage
Google Meet	276	78.63
Microsoft Teams	46	13.11
Zoom	20	5.70
Cisco Web-Ex	4	1.14
Impartus	2	0.57
Sky Room	1	0.28
Blackboard Collaborate	1	0.28
Depends on the teacher	1	0.28
Total	351	100.00

As per the survey, as shown in table 4, the most used platform for online learning is Google Meet followed by MS Teams, Zoom, Cisco WebX and other mediums. Google Meet, a free platform is the choice of many. whereas Zoom, also being a free platform, was prey to privacy invasion and other controversial matters, hence being avoided by many. MS Teams on the other hand was closely followed by Google Meets for a secure experience.

Question 6: Are you aware of online platforms that already existed before this situation, like Coursera, edX, Udemy, Swayam, and so forth?

While the COVID-19 pandemic has been the key driver for the increase of online learning, it is crucial to analyze if online curriculum platforms existed before the pandemic, and/or how COVID-19 has affected its popularity. An analysis of the survey results reveal that 42.2% of students were not aware of these online educational programs before the pandemic, 33.9% of them were aware but they never enrolled in the courses provided, 17.7% were aware and have actively participated in the online learning programs and 6.3% are gaining awareness and developing interest to join the online learning courses. Hence, the rise in various online learning platforms during the pandemic is evident.

Question 7: Do you feel you are having a smooth internet connection always?

Figure 2
Internet Connection Graph

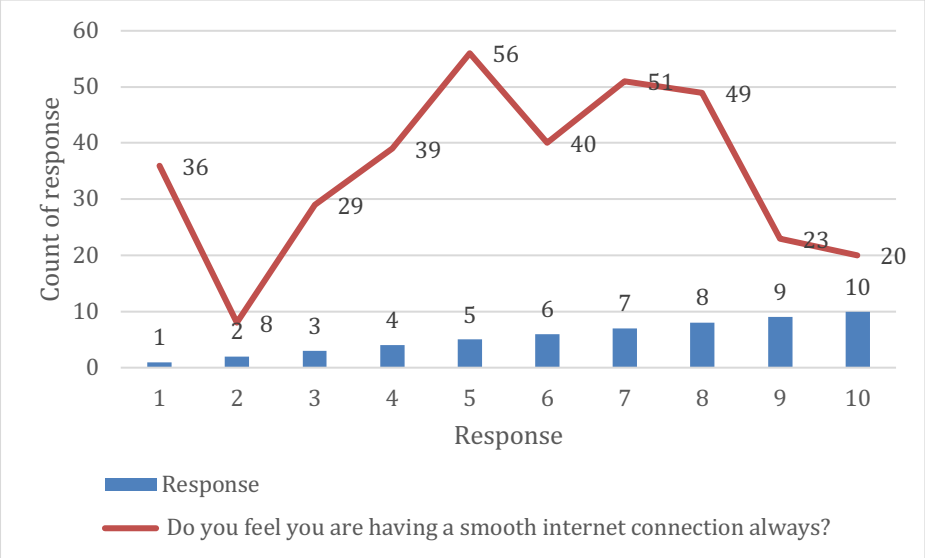


Table 5
Internet Connectivity Scenario

Do you feel you are having a smooth internet connection always?	
Mean	5.62
Standard Error	0.13
Median	6.00
Mode	5.00
Standard Deviation	2.52
Sample Variance	6.35
Kurtosis	-0.76
Skewness	-0.22

Figure 2 and Table 5 provide graphical and statistical analysis respectively of internet connectivity of various respondents. India, with over 687 million internet users in January, is the second biggest online market in the world, ranking only below China and the rate of internet penetration was about 50% in 2020, despite the huge base of internet subscribers (*Internet Usage in India - Statistics & Facts | Statista*, n.d.).

Question 8: Do you have more parallel data users on the same network? (Like siblings studying from home or parents working from home)?

Analysis showed that around 59.3% of respondents have their data in sharing while the remaining 40.7% did not.

Section B: Time Management

Question 1: How long do your official online sessions last?

Analysis shows that sessions last for about 4-5 hours in 32.8% cases, 5-6 hours in 27.4% cases, 2-3 hours in 21.7% cases and 4-5 hours in 18.2% cases. The majority of the student workload is text-based, and there is a lack of practical learning experience. It is said that the maximum concentration ability of a student while learning is 45-50 minutes. Online classes being continuous gives fewer breaks. Hence it is quite possible that your active learning pace will be decreased and you will develop partial listening resulting in slipping out some important details.

Question 2: Does the online mode of study create unwanted stress?

Figure 3
Graph of Unwanted Stress Levels Observed in Students

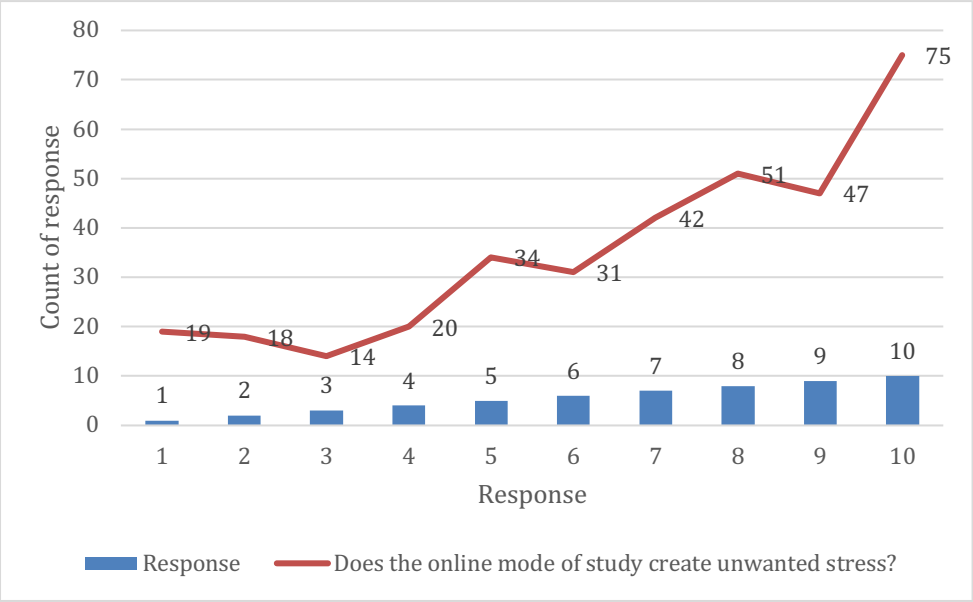


Table 6
Information Regarding Stress

Does the online mode of study create unwanted stress?	
Mean	6.86
Standard Error	0.15
Median	7.00
Mode	10.00
Standard Deviation	2.73
Sample Variance	7.46
Kurtosis	-0.64
Skewness	-0.64

Figure 3 and Table 6, as shown, provide details about unwanted stress due to online learning. COVID-19 may have several psychological effects on university students, which can convey anxiety. This stress may have adverse effects on a student's academic and psychological well-being, maybe more than anxiety and tension, the rapid online transformation to remote education has revealed much about higher education sector shortcomings and maybe a lot about what needs to be changed in universities. If a student is anxious or frustrated, it affects their mental acuity in class or while learning. Stress can lead to students dropping out of school or avoiding classes.

Question 3: Do you believe you have extra time now due to online studies?

The study found that about 54.7% of students agreed with the question which might be associated with the time saved during commuting from campus to home, reduction in lecture hours by the faculties, considering the pandemic situation and psychological stress while a remaining 45.3% omitted a response. It is suggested that there will be less time for recreational activities. This can lead to the procrastination of studies and regular academic tasks. It is human nature and behaviour to withdraw for a certain period. It will take more effort and determination to fill the gap of your lacking knowledge on the subject matter. If time management is handled, it leads to more productive use of the hours in a day.

Question 4: In this additional time that you have been able to obtain, did you attend any extra courses?
The study showed that about 70.4% of students did not attend any extra course, which might be due to various psychological stresses and other household problems, whereas 29.6% of students learnt new things apart from their regular studies. It is evident that recreation time also leads to productivity by helping the brain function better. If apart from learning, online classes have provided something better, then this has been linked to freedom and flexibility. Hence it may happen that the time one thought one would have spent learning some extra course might have gone into procrastination or distraction or mastering some hobby.

Question 5: Did this allow you to participate in any additional Webinars, Competitions, Learning Sessions, and so forth?

Results revealed that 65.8% of students participated in various webinars, competitions, learning sessions, and so on. whereas the remaining 34.2% did not. Extracurricular events are optional activities that stimulate physical or mental structures. The webinars, conferences and learning sessions not only boost the motivational drive-in academic study but also helped students in developing a more professional attitude. The competition may students understand where they stand and how they can improvise their skill sets. Online classes are easily adaptable and accessible.

Question 6: Do you believe that the online mode is far more comfortable than the offline mode?

From the study, 76.9% of students reported that online is not more comfortable than the offline mode of learning. This could be on account of poor ergonomics: students are not bound to practice positive ergonomics at home, as opposed to schools. One of the most common causes for the recent increase in back pain or fibromyalgia are online courses in beds and sofas. Additionally, online dependence on screens may cause eye-related problems too.
Whereas 23.1% of students found online learning to be more comfortable than offline due to geographic flexibility, the comfort of home, self-paced learning options, learning flexibility, and so on. The environment provided for academics still may lack the feel of the learning experience. Students may feel detached not only from the curriculum but from the institution in general.

Section C: Understanding of the Course Content

Figure 4

Graphical Analysis of Section C: Understanding of the Course Content

Table 7

Mathematical Analysis of Section C: Understanding of the Course Content

Question	Mean	Standard Error	Median	Mode	Standard deviation	Sample variance	Kurtosis	Skewness
1	4.38	0.14	4.00	1.00	2.71	7.33	-0.85	0.36
2	5.30	0.14	5.00	5.00	2.69	7.24	-0.96	0.06
3	5.10	0.14	5.00	5.00	2.70	7.29	-0.97	0.05
4	5.47	0.15	6.00	5.00	2.78	7.75	-1.02	-0.07
5	7.44	0.12	8.00	10.00	2.32	5.37	0.09	-0.84

Question 1: Are you able to understand the mathematical derivations or concept via an online platform?

Figure 4 and table 7 gives graphical and mathematical explanations respectively on students' understanding of various concepts and mathematical proofs via the online platform of learning. This suggests that this is the maximum that students are unable to understand mathematical derivations or concepts. This is because of the lack of writing practice. Studies show that students are directly wired to enhanced performance and good grades via practice (Beesley, Andrea D., Ed.; Apthorp, Helen S., 2010). It reflects the encoding properties of visual-motor information as repeated writing has enhanced the free recall of the text (Arbuthnott, 2005).

Question 2: In case of a doubt that you may have, are you able to clarify the same using the online mode of teaching?

Figure 4 and Table 7 provides data on the participation of students in the teaching-learning process. The study indicates that a particular community dominates the online dialogue and so manipulates newcomers (Piccoli et al., 2001).

Question 3: Are teachers able to deliver the contents as effectively as in the offline mode?

Figure 4 and Table 7 provide graphical and mathematical analysis respectively of the effectiveness of content delivery by teachers in the online mode as compared with the offline mode. Teachers are expected to enhance the learning process of reluctant students and engage them using motivational skills. There may be achievement gaps in students' academic records and hence constructive criticism can be provided in case the curriculum is poorly delivered.

Question 4: Are you able to absorb and retain the same amount of information as before or are you distracted by other online options like news, chats, games, and so forth?

Figure 4 and Table 7 provides graphical and mathematical analysis respectively regarding information absorbed or retained by students. Studying the focus habits and learnings of online learners using eye motion technologies have been carried out for an observational review of online learning processes (Mu et al., 2019). In face-to-face environments, professors usually depend on their concentration to perceive and react openly to student behaviours whereas teachers can only view the head and shoulders of a pupil in an online environment, which restricts available detail. However, students may be distracted from online studies and tend to open the notifications popping up in their devices, usually from social media.

Question 5: Do you require extra/additional video, presentation slides, support materials apart from what is distributed by your subject teacher for sufficient understanding of the content delivered?

Figure 4 and Table 7 provides graphical and mathematical analysis respectively on the need for extra sources to understand the topic properly.

Question 6: Does the lack of face-to-face interaction create a roadblock in the online learning mode?

The study reveals how students perceived interaction with their faculties. Around 75.5% of students faced difficulty and considered this as a roadblock whereas the remaining 24.5% of students did not face any difficulty. Interaction enabled people to exchange ideas, gain input and assess success more easily. Timely input and contact with the teacher can help students feel appreciated and provide the knowledge they need more quickly. Lack of immediate responses to the questions was also found to be a problem in online learning.

Section D: Assignments and Submissions

Question 1: Does the online mode of teaching create ease with completing assignments?

Figure 5
Graphical Analysis of Section D: Assignments and Submissions

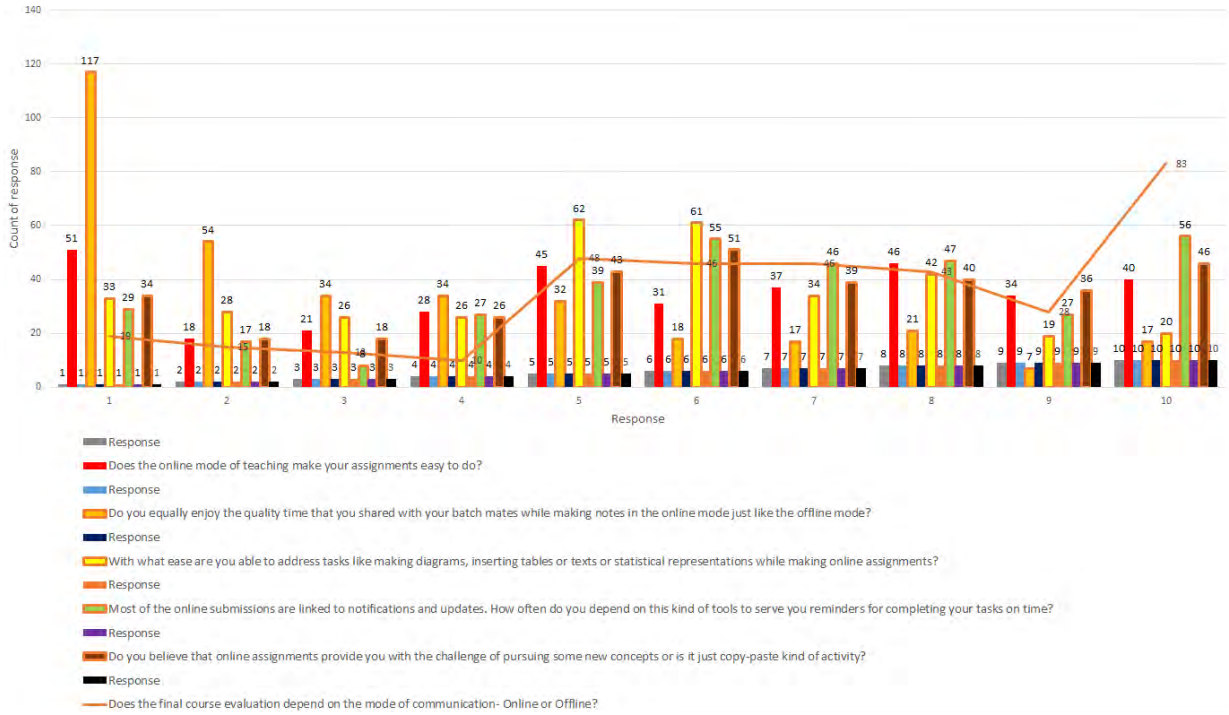


Table 8
Mathematical Analysis of Section D: Assignments and Submissions

Question	Mean	Standard Error	Median	Mode	Standard deviation	Sample variance	Kurtosis	Skewness
1	5.72	0.16	6.00	1.00	2.95	8.71	-1.15	-0.21
2	3.56	0.15	3.00	1.00	2.73	7.48	-0.32	0.89
3	5.39	0.13	6.00	5.00	2.53	6.39	-0.79	-0.10
4	6.33	0.14	7.00	10.00	2.70	7.29	-0.67	-0.43
5	6.06	0.15	6.00	6.00	2.78	7.73	-0.90	-0.31
6	6.81	0.14	7.00	10.00	2.66	7.10	-0.55	-0.55

Figure 5 and Table 8 gives graphical and mathematical analysis respectively on ease of solving assignments. There are mixed opinions from the student's side. The reason for the negative response might be due to a rise in the count of assignments in the online mode as compared to the offline mode by the teachers. Hence increased assignments result in writing, and solving more challenges that require more researching of things. On a positive note, students found it satisfactory to complete assignments, as this made them learn concepts more deeply and regular assessment made them pick up and improve their mistakes.

Question 2: Do you equally enjoy the quality time that you shared with your peers while making notes in the online mode just like the offline mode?

Figure 5 and Table 8 provide graphical and mathematical analysis respectively, which reveals that students lacked or did not enjoy quality time during the online mode of study. Students must use technology to help these peer-related relationships and social presence to learn

effectively. Education researchers have argued that social participation is essential to facilitate the development of a common educational atmosphere.

Question 3: How easily are you able to address tasks like drawing diagrams, inserting tables or texts or statistical representations while completing online assignments?

Figure 5 and Table 8 gives graphical and mathematical analysis respectively, giving information about the ease with which students can address tasks like making diagrams, inserting tables or texts or statistical representations while making online assignments.

Question 4: Most of the online submissions are linked to notifications and updates. How often do you depend on this kind of tool to provide reminders for completing your tasks on time?

Figure 5 and Table 8 provides graphical and mathematical analysis respectively about student's dependency on various reminding apps or software or app notification for completing their tasks.

Question 5: Do you believe that online assignments provide you with the challenge of pursuing some new concept or is it a passive activity?

Figure 5 and Table 8 gives graphical and mathematical analysis respectively which shows the actual effectiveness of assignments in their studies. Analysis shows how students feel about assignments provided to them i.e. whether they are helping them build up concepts and provide a challenge to them to learn new things or is it just copying tasks from the internet. Students appear to copy material from available sources, leading to a decrease in their creativity. The assignments, when provided in form of application-based questions, require greater higher-order thinking. When a given assignment challenges a student, they appear interested and motivated to pursue these on their own. This can help in exploring the new direction in academic study and provide a sense of achievement.

Question 6: Does the final course evaluation depend on the mode of communication- Online or Offline?

Figure 5 and Table 8 gives graphical and mathematical analysis respectively giving information about the final course analysis.

Section E: Ease and Comfort of Study

Question 1: Do you have the option to access your session contents at your convenience?

The study reveals that 53.9% did not have access to session content later on. Students fail to utilize the technology in general cases and when they do not, the aptness of technology to gain access is overpowered by the non-fulfilment of the purpose for which it was originally designed, whereas 40.7% of students had access to the content as per the convenience. Online videos provide easy access to the content of the courses in support of the online distribution system and are flexible to check content multiple times as required.

Question 2: Do you believe that the course contents delivered via online mode are far more organized and streamlined as compared to the offline mode of teaching?

The study considered whether student's perceived that course content delivery was more organized and streamlined in the online platform, as compared to offline. A total of 67.5% of students did not find that online learning was the more organized form for content delivery since the connectivity may be lacking, the students and faculty were not in proper contact, unable to get the proper link to join the session whereas the others (32.5%) found online to be better in these terms, who might be those who were able to access and join the content or session properly or would may have received the session joining information in a better way.

Question 3: Do you believe that online courses are more expensive in terms of money, energy and effort as compared to offline courses?

A total of 51.3% found online platforms a better choice comparatively since money could be saved by avoiding transportation facilities, and rental facilities. The remaining 48.7% found offline platforms better as they felt more money was required to be invested to attend online sessions as fast internet connections are required to access them.

Question 4: In case you get a chance to decide which mode is to be used for further communication, would you opt for an online mode of study?

This aspect shows the choice of students to prefer a further learning process after the pandemic passes with 72.4% of students preferring to avoid the online platform and 27.6% wishing to continue.

Question 5: Do you believe that the online mode of study has brought about a paradigm shift in the way people visualize the effectiveness of online tools in delivering content?

The sudden transformation from traditional learning to virtual learning has dramatically altered the student approach. A total of 64.1% agreed with the statement whereas the remaining 35.9% disagreed.

Section F: Skill Development and Motivation

Question 1: Do you support the fact that online learning has enhanced your computer and Internet-related skills to a large level?

This question considers whether students were able to develop computer and internet related skills due to this shift of learning platform. A total of 71.5% of students agreed and were able to develop their skills whereas the remaining 28.5% did not. Online learning is vital for the experience and comprehension of a student in the world of the internet. Individuals experiences and advanced technical capabilities lead to the development of reasoning skills. It further consists of patterns of intellectual thought process which are important factors in the progress of students in an informatics world.

Question 2: Do you agree that online learning has led to a drastic reduction in the development of interpersonal skills amongst individuals?

This question provides information about student opinions on the reduction in the development of interpersonal skills due to participation in the online mode of learning. In the context of this, 74.9% agreed that they were not able to effectively develop interpersonal skills. Reduced physical activities, community collaborations and organizational skills caused social isolation.

Whereas 25.1% disagreed with this which might be due to the student's involvement in various extracurricular activities including online competitions, MOOC courses, webinars, and so on.

Question 3: Do you believe skipping sessions is more prevalent in the online mode comparatively?

This question provides comparative data on how many students skipped sessions in the online mode. A total of 66.7% opted to skip the sessions whereas 33.3% did not skip them. The reason behind skipping could be barriers like unequal level of infrastructure, lack of internet connectivity, lack of devices for attending sessions, flagging motivation and adult monitoring in particular. Thus, their motivational drive was reduced with regard to attending classes. Excuses build up from challenges of physical and mental wellbeing to the lagging and poor network connection.

Figure 6
Graphical Analysis of Section F: Skill Development and Motivation

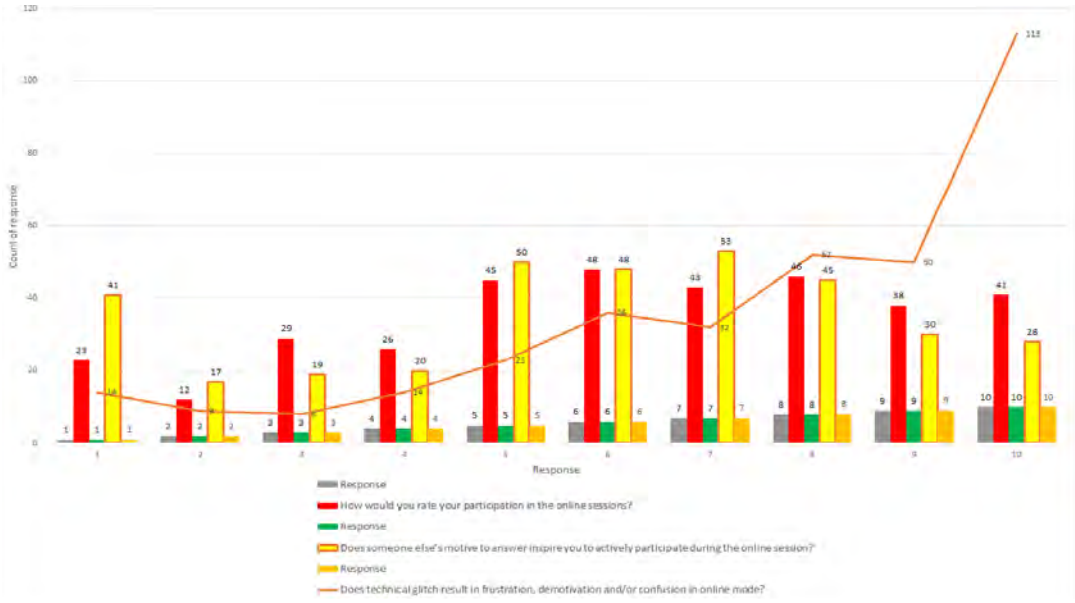


Table 9
Mathematical Analysis of Section F: Skill Development and Motivation

Question	Mean	Standard Error	Median	Mode	Standard deviation	Sample variance	Kurtosis	Skewness
4	6.19	0.14	6.00	6.00	2.61	6.83	-0.81	-0.32
5	5.79	0.14	6.00	7.00	2.69	7.24	-0.83	-0.34
6	7.59	0.14	8.00	10.00	2.54	6.45	0.20	-1.02

Question 4: How would you rate your participation in the online sessions?

Figure 6 and Table 9 provide graphical and mathematical analysis respectively on student's participation in online learning sessions. The participatory habits for learners online are affected by technology and interface features, subject field knowledge, student roles and

assignments, and an overload of details. The participation of learners is an integral factor for active and comprehensive preparation.

Question 5: Does someone else's motive to answer inspire you to actively participate during an online session?

Figure 6 and Table 9 provides graphical and mathematical analysis respectively with regard to collected responses.

Question 6: Does a technical glitch result in frustration, demotivation and/or confusion in online mode?

Figure 6 and Table 9 provide graphical and mathematical analysis respectively on student responses to technical glitches. Users may encounter several technological problems that impede and delay the process of teaching.

Section G: Course Satisfaction and Conclusion

Figure 7
Graphical Analysis of Section G: Course Satisfaction and Conclusion

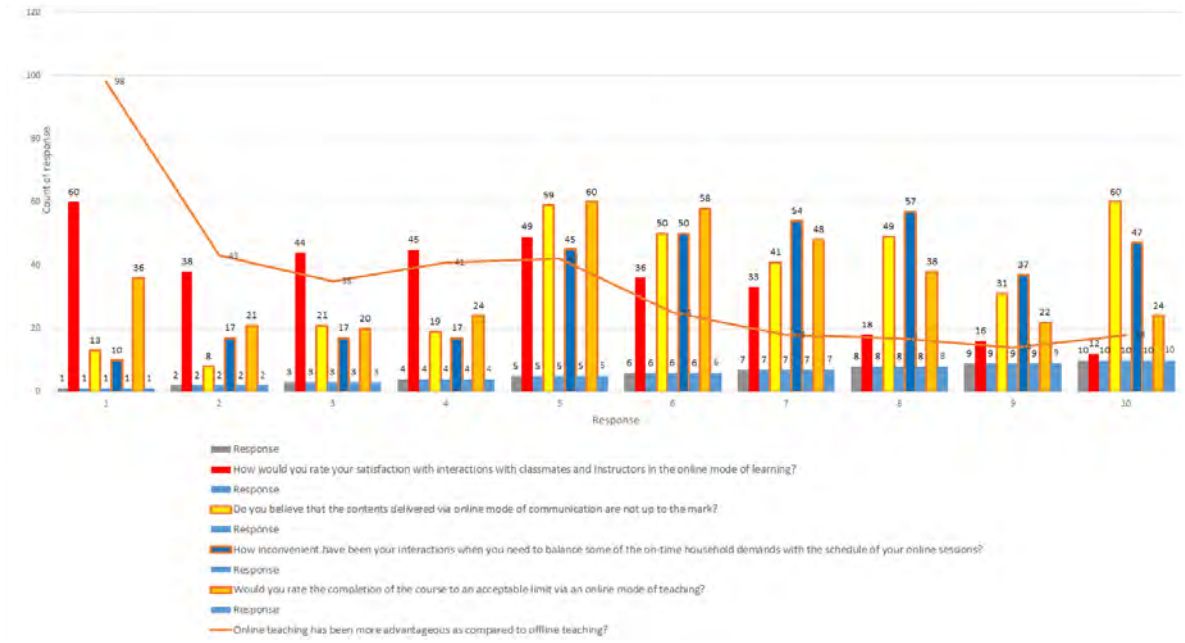


Table 10
Mathematical Analysis of Section G: Course Satisfaction and Conclusion

Question	Mean	Standard Error	Median	Mode	Standard deviation	Sample variance	Kurtosis	Skewness
1	4.41	0.14	4.00	1.00	2.56	6.53	-0.77	0.37
2	6.61	0.13	7.00	10.00	2.46	6.06	-0.61	-0.34
3	6.62	0.13	7.00	8.00	2.40	5.77	-0.46	-0.48
4	5.58	0.14	6.00	5.00	2.56	6.55	-0.72	-0.22
5	3.93	0.15	3.00	1.00	2.76	7.60	-0.60	0.68

Question: How would you rate your satisfaction with interactions with classmates and instructors in the online mode of learning?

Figure 7 and Table 10 provides graphical and mathematical analysis respectively on student's satisfaction with interaction with classmates and instructors in the online mode of learning. Interactions and mediation with peers and the teacher can be quite burdensome in an online learning setting. Due to a lack of face-to-face interactions, the institutions and organizations are inclined towards the fresh technologies, which enhance communication and makes functioning efficient. As a result, there have been reports of significant contact frequency during online courses.

Question: Do you believe that the learning content delivered via the online mode was acceptable?

Figure 7 and Table 10 provides graphical and mathematical analysis respectively on student opinions on content delivered during the online session. An efficient online class, therefore, relies on the organized content of the course.

Question: How inconvenient have been your interactions when you need to balance some of the on-time household demands with the schedule of your online sessions?

Figure 7 and Table 10 provides graphical and mathematical analysis respectively on student opinions regarding their interactions when they need to balance some of their on-time household demands with the schedule of their online sessions.

Question: Would you rate the completion of the course to an acceptable limit via an online mode of teaching?

Figure 7 and Table 10 provides graphical and mathematical analysis on course completion via the online platform.

Question 5: Has online teaching been more advantageous as compared to offline teaching? What according to you are the most important factors that contribute towards this choice?

Some of the advantages collected from the respondents included:

- Convenient to attend
- Timing is flexible
- Commuting/Transportation time saved
- Can access material and recorded lectures (if provided) in case of doubt.
- High affordability and accessibility
- Extra time for recreational activities
- Self-paced/ self- dependency approach
- Ensures safe and secure environment during the pandemic
- Reduction in cost
- Time management skills improved.
- Saves the energy of students.
- Improved self-discipline

Likewise, the disadvantages collected from respondents are:

- Partial understanding of the topics/concepts.
- Lack of focus/concentration/seriousness and sincerity.
- Minimum or no motivational drive for academic study.
- Losing interest in the online sessions.
- COVID-19 pandemic situation adds to the pressure and stress level of students.
- High levels of anxiety.
- Lack of participation, interaction, skill development.
- Not comfortable or used to the online learning approach.
- Posture related issues/eye strain
- No practical skill development.
- Poor audio/video quality leads to missing out on important concepts.
- House chores demand/disturbance/distraction.
- Delay in responses.
- Lack of sense of belonging or feelings of isolation.
- Virtual presence only or lack of social presence.

Conclusion

The existing system disparities and the need for free and low-cost Internet access for education have been highlighted by COVID-19. It is likely that content delivery methods should be improved through the streamlining of technology platforms. Even courses in various languages should be planned to expand their coverage for rural Indian youth and opportunities. Novel ways should be established to improve online learners' social skills. Several studies show that teacher contact with students has a major effect on student experiences of online study. Factors such as coherence in the design, the opportunity to interact in critical thought and information processing with course instructors, interactivity score on the online environment, opportunities for online learning for mentors and peers, academic self-concept as well as competencies necessary for technology use to keep up with curricula, universities and organizations switch to online sites. It was found that online learning was beneficial, as it provided students with accessibility and comfort. Students prefer organized material of videos that were posted to the websites of the institution. However, many students indicated that because of technical limitations, delayed input and failure of the instructor's handling of information and communication technologies, online classes could be more challenging than conventional classrooms. Thus, during an online course to allow the learner to be more efficient and profitable, these considerations should be borne in mind. Once the pandemic has ended, the growth of educational programs across online study support systems is likely but the preference remains for traditional courses. This report will also help to trigger innovation in higher education with regard to online components.

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