Research Article

Transforming Learning to Online Education 4.0 during COVID-19: Stakeholder Perception, Attitude, and Experiences in Higher Education Institutions at a Tier-III City in India

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Higher education institutions worldwide had to quickly pivot to delivering online classes as the COVID-19 pandemic set in. This disruption brought into focus institutional preparedness to ensure academic continuity, faculty proficiency in the use of ICT, and student readiness to adapt to an online-only model suggested in Education 4.0 framework. The Education 4.0 framework emphases to use advance technology and tools to transform education system. It was initially envisaged that the online-only model of education will at best be a stop-gap arrangement. However, as the pandemic continues unabated across India, the education community needs actionable data to fine-tune its online delivery model, to ensure its effectiveness, and retain its value perception in the eyes of the stakeholders. This is a critical aspect as evidence suggests that the initial high level of online engagement is petering out due to overexposure, mental saturation, and fatigue among both the students and faculty members. This research paper examines the perceptions, attitudes, and experiences of stakeholders involved in online education from Jammu, a Tier-III city in India. The study asserts that real "value creation" in an online mode can happen when all the stakeholders are equally motivated and working together. Institutions need to prioritize value delivery, support faculty members, provide the needed resources, and set clear expectations.

1. Introduction

On the January 30, 2020, the World Health Organization declared the coronavirus outbreak as a global public health emergency. Due to the pandemic educational institutions all over the world, including India were shut down. As per date released by the UNESCO, over 800 million students are facing disruptions in their education ranging from full school closures to part-time academic schedules [1]. The pandemic, therefore, significantly disrupted the system of education, which was largely built around a face-to-face model of instruction and peer interaction in a classroom setting.

This necessitated exigent use of technology by institutions and educators worldwide to ensure the continuity of the teaching–learning process at all levels. Institutions which were early adopters of technology and led by proactive leadership teams made a smooth transition to an online-only mode of educational delivery, while other institutions struggled with choosing the right platform and training their faculty in its effective use. However, to the credit of all institutions, new competencies and capabilities were developed in record time and online classes, though not perfect, were delivered in some form or the other. This widespread adoption of technology in education has led to an unprecedented shift from a teacher-centric model toward a student-centric model, where the teacher's role has become more of a facilitator [2].

The higher education sector has witnessed an unprecedented adoption of learning management systems, video-conferencing platforms, and access to repositories of digital content. In many ways, learning has been democratized with the students exploring new material and online resources on their own. Education 4.0 is a desired learning strategy that coincides with the emergence of the fourth industrial
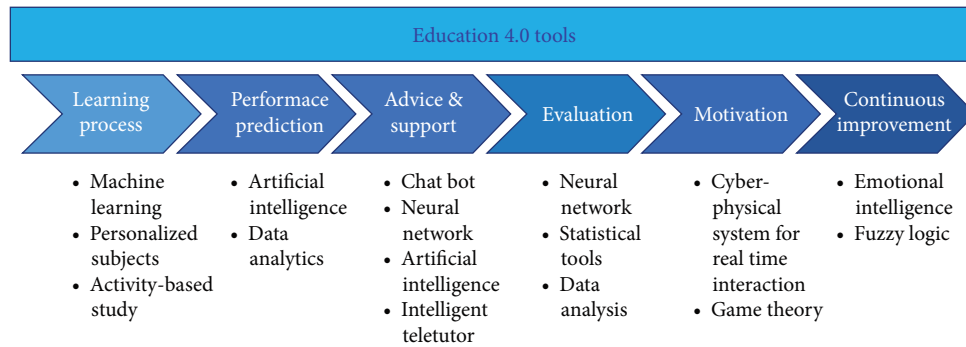
FIGURE 1: Education 4.0 tools for skill enhancement.

revolution. Smart tools/technology, artificial intelligence, ICTs, and robotics are all part of this industrial revolution, and they all have an impact on our education system as shown in Figure 1. Faculty members too have become technology savvy and are better placed to leverage digital content than before. Thus, some significant positives have come out of a challenging situation.

It is now clear that the situation remains far from normal, with the second wave of COVID at its peak and a third wave widely anticipated, and the online education model shall persist for the foreseeable future. Many parents are reluctant to send their wards to schools or colleges till a large percentage of the population has been vaccinated, which could be till the middle of 2022. It is therefore imperative to research all aspects of the online-only model of education and examine stakeholder perspectives to ensure value-creation for the students based on meaningful engagement. Such studies would need to be conducted in diverse environments so that locally customized models can be formulated to meet and exceed stakeholder expectations.

This paper presents a study of stakeholder perceptions, attitudes, and experiences with the online education model. Key learnings, best practices, and some strategies to strengthen the value articulation in an online-only delivery model are presented which can be replicated in similar settings.

2. Review of Literature

As all education moved online at the onset of the pandemic, proponents of online education were quick to predict the end of the traditional education model owing to this massive disruption. On the other hand, large universities felt that online delivery was a temporary phase and that students would always pay a premium for an in-person, on-campus learning experience. The truth might lie somewhere in the middle and a blended model might take shape in future. Nonetheless, it is safe to conclude that institutions will be inclined to use the online delivery model honed during the pandemic to continue to deliver additional value to students even when physical classes resume. Institutions which dismissed online education as a fad or considered it as a stop-gap arrangement are racing against time to equip their organizations to deliver value. Beyond the obvious research into the merits and demerits of online delivery, it is
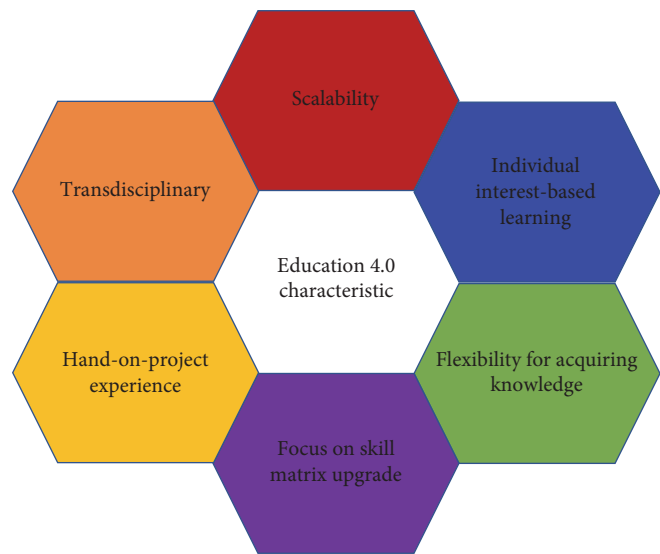

FIGURE 2: Characteristics of Education 4.0.

important to look at stakeholder experiences and perspectives in a completely online delivery model during the pandemic, a time of great uncertainty and anxiety. Insights gained from such studies across diverse environments shall help institutions cater more effectively to the needs of the faculty and students. The characteristic of Education 4.0 is shown in Figure 2. It states that it focuses on individual goal through upgrading the skill of the students taking into student interests. With the education sector not likely to open in India anytime soon, institutions would need actionable insights on enhancing their value perception in a purely online engagement model.

Several studies have been conducted during the pandemic time to analyze the impact of online education and captured the insights of various stakeholders. A study by Chen et al. [3] has tried to study the satisfaction level of the Chinese students toward the online education platforms. It was concluded in the study that personal factors of the user have no direct influence on user satisfaction, while the availability of the platform seems to have the greatest influence on satisfaction of the user. The study also highlighted some of the key challenges faced during the conduct of online classes

like internet congestion, lag in the video during live interactions, etc.

Some research studies in the developed countries which examined positive student experiences with pure online delivery concluded that institutions which proactively adopted technology and invested in technology platforms, content, and virtual labs, etc. fared a lot better than other institutions [4, 5]. A study by Long et al. [6] provides important insights on how the pandemic provided opportunity for course instructors to improve their online teaching style, develop new content and engagement strategies and adapt to a completely online teaching environment. There was actually a need for value delivery and innovative ways of engaging and motivating the students had to be taken up [7]. Amid the various challenges, the pandemic situation has also opened up various opportunities for the education sector and there is definitely a need to rethink the strategies outside the four walls of the classrooms [3].

A study by Olszewska [8] has tried to express the opinions of Polish university students on the effectiveness of online learning during the COVID pandemic and forced distance learning. It was found that students prefer the traditional mode of classroom teaching and perform better in the class environment. The students although appreciate the online learning benefits but there is lack preparedness and willingness to switch to purely online learning. Similarly, in another study by Blizak et al. [9], the researchers investigated the perceptions of the Algerian students when they had to make an abrupt transition to the online mode of teaching–learning due to the pandemic. The results of the study have indicated that students have a negative perception of the online learning with resistance to online teaching citing low satisfaction.

Several studies have examined the stakeholder experiences in the Indian context during the pandemic. They have brought out the key challenges faced by the stakeholders, including the faculty, students, parents, as well as institutional leaders. Dhawan [10] highlighted the challenges associated with online learning in India, primary being that faculty was ill-equipped to be effective online educators. This major gap has led to the growth of Ed-Tech Companies providing quality content, packaged in small snippets, and continuous assessment to check comprehension. Muthuprasad et al. [11] studied the perceptions of the students toward the online learning during the pandemic. The results indicate that students mostly make use of the mobile phones to attend the online classes which inhibits their level of comprehension due to low attention levels. Students were also very reluctant to switch on their cameras during online classes. Mishra et al. [12] have studied user preferences toward tools and platforms for delivering/consuming online education. Zoom, Cisco Webex, and Google meet were the most widely used online platforms in India during the pandemic. For smooth facilitation of the online teaching–learning massive use of social media apps like WhatsApp group was extensively used. The findings of the study indicate that proficiency in computer literacy, domain knowledge, self-motivation, empathy with the students, and access to digital material and resources were some of the winning strategies during these difficult times from the teachers' perceptions. Arora and Srinivasan [13] in their study have indicated that for students the experience has been of mixed nature. They believed that the online learning experience provided them an exposure outside the classroom but many of them showed a lack of interest in the online classes, faced distractions, and expected major concessions, including mass promotions to next classes/ semesters as a matter of right. In India, the pandemic also threw up existential concerns for nonproactive institutions, especially in smaller towns and cities leading to further consolidation in the sector. By and large the pandemic has not been kind to the student community resulting in significant academic loss and a perception of low value creation via a purely online mode of education.

Thus, researchers have focused on several aspects of online education during the pandemic from issues, perceptions, and challenges from the perspective of students and teachers to interventions or lack thereof by educational institutions. The experiences of a purely online teaching–learning environment have varied significantly from developed countries to developing countries showing that the context and environment of each study are relevant and significant [14]. Socioeconomic and cultural factors have also impacted the perceived effectiveness of online teaching during the pandemic. While studies in developed countries have focussed on online teaching pedagogy improvements, student engagement, and experiences, the developing countries had to contend with access, training, motivation, and adoption issues. In India too the focus of research studies has been on the challenges and opportunities while strategies, best-practices which worked have not been researched and articulated for the benefit of the teaching community and institutional leaders. Such insights shall be crucial to deliver significant value to the millions of learners across India if the pandemic persists in the near future.

2.1. Purpose of the Study. The purpose of the study was to investigate the attitudes and perceptions of the primary stakeholders, i.e., faculty members and students in the higher education institutions at a Tier-III city in India. The study intended to consolidate key learnings, faculty experiences with technology and content, student attitudes, perceptions, and expectations during this time. The viewpoint of the institutional leaders was also examined to articulate strategies for institutions and educators in building deeper engagement with students to build a favorable stakeholder perception.

2.2. Research Design. The study was designed as a qualitative study based on interviewing different stakeholders across 10 higher education institutions in the region. The primary questions addressed by the study are:

(1) What are the attitudes and perceptions of faculty and students toward the online education model in the higher education sector in Jammu city?

TABLE 1: Sample interview questions.

Students	Faculty	Leadership team
Were you satisfied with the quality of the online classes and content delivery by your teachers?	How would you rate your ICT readiness at the start of the pandemic and comfort level in delivering online classes?	How did you monitor the effectiveness of the online classes?
Would you prefer online classes over face-to-face learning?	Were you provided any training by your institution in delivering online classes or in the use of online platforms?	Do you think there was a need for formal training and certification for conducting the online classes?
How were labs conducted by your institution? Were you satisfied with the quality and experience of attending these lab sessions, if at all?	How would you rate the student engagement levels during online classes?	Do you think that the google form assessment was an effective way of assessment?
What challenges did you face while attending online classes?	What challenges did you face in delivering online classes?	During these challenging times did you provide some kind of flexibility in policies?
Did you experience any stress during the lockdown with regard to your studies?	Did you receive adequate institutional support during the pandemic? Could the institution have taken additional measures to support you better?	What do you think was an effective media for communication between the faculty and the students?
Were you satisfied with the online evaluation and assessment process adopted by your institution?	How would you compare the workload while delivering online classes working from home to the normal workload at your institution?	If you had advance knowledge of the pandemic, what additional measures would you have taken to improve student and faculty experiences?
If you had to attend online classes for the next 1-year, what suggestions would you give to improve the overall experience and value for you?	Did you experience stress during the pandemic? Did you feel that the students were stressed too?	Have you enhanced your IT/ICT budget post the pandemic?

(2) What strategies work at the level of the institution and the individual educator in creating a favorable stakeholder perception?

3. Data and Methods

3.1. Data Collection. The data for the study was collected through semistructured personal interviews [15] conducted with the students and faculty members, and institutional leaders. The interviews of all the respondents mentioned above were conducted virtually and audio-recorded. The number of participants in the study included 100 students, 40 faculty members, and 10 institutional leaders. The age range of the students varied between 18 and 25 years and the average age was 20 years. The age range of the faculty members varied from 26 to 65 years, the average being 34 years. The study was carried out after 6 months had elapsed since the lockdown in March 2020. The faculty members belonged to seven different institutions who were teaching undergraduate and postgraduate courses in engineering, teacher education, management, commerce, and psychology.

Initially, informal conversational interviews were conducted with the participants, and then the standardized open-ended interview was conducted with respondents who were inclined to provide detailed insights into their experiences. Some of the questions asked to the faculty, students, and leadership teams are mentioned in Table 1.

Standard templates for determining the effectiveness of online teaching–learning were not used due to context mismatch. Here, the entire delivery had shifted from offline to online mode and for a majority of the students and faculty this was their first experience with online learning. The questions were directed yet open-ended by design to elicit diverse responses from participants. These were face-validated by subject experts from a teacher education and online education background. Sample interviews were conducted and the interview questions refined over two iterations.

3.2. Data Analysis

3.2.1. Sentiment Analysis. The analysis of the transcript text files was carried out using automated sentiment analysis [16] to figure out the overall attitude perception of the students, faculty, and the leadership team. The analysis cross-referenced the words in each of the transcripts with an opinion lexicon of both positive and negative words [17]. Using this method, we calculated the sentiment score for each sentence in the interview transcript using the following formula:

$$Score = number\ of\ positive\ words - number\ of\ negative\ words$$

If Score > 0, the sentence is considered to have an overall "positive" opinion

If Score < 0, the sentence is considered to have an overall "negative" opinion

If Score $= 0$, the sentence is considered to have an overall "neutral" opinion

A breakdown and quantitative analysis of sentiment scores by individual properties was performed to understand the overall attitude of different groupings of people who were interviewed.

3.2.2. Qualitative Analysis. We also analyzed all interview transcripts through a manual text coding process using a framework method with emerging thematic analysis via NVivo, a qualitative data analysis software program. Prior to the coding, interviewee names were replaced with unique identifiers following the procedure outlined in the approved IRB protocol to protect individual privacy.

4. Results and Discussion

There were two research questions. The results and discussion for each research question are presented below:

Research Question 1: What are the attitudes and perceptions of students and faculty in higher education toward the online delivery of education during the pandemic?

4.1. Sentiment Analysis. The sentiment analysis extracted 957 total interviewee statements: 623 from students, 262 from faculty members, and 72 from the leadership teams. The analysis of the students' transcripts showed that about 54% of the comments were neutral with positive and negative phrases in equal measure. Overall, the average sentiment score was about 0.162, which means that the comments had a slightly positive skew. Of the 46% statements that had extreme sentiment scores (i.e., above +2 for positive and less than −2 for negative), 70% of the statements were positive while the rest were negative. This indicates that students had mixed feelings toward the purely online delivery mode during the pandemic. Most of the extreme negative sentiments revolved around the lack of access to the institutional infrastructure and the institutions demanding full fees during the period. A similar trend of mixed sentiments trend was observed for faculty members as well. However, the areas of concern were varied for faculty belonging to different institutions. Overall, 65% of the women faculty responses (90% for married women faculty) indicated a negative sentiment due to increased stress on working from home. Overall, 44% of the faculty respondents expressed extremely negative sentiments around deduction in salaries paid by their respective institutions.

Discussions with the respondents were recorded, transcribed, and content analysis carried out. Meaningful sentences were coded and those belonging to the same code were organized into subthemes. Finally, similar subthemes were grouped together under a main theme. The coding mechanism and the emergent themes were reviewed and cross-checked for correctness. Five major themes emerged as depicted in Table 2.

4.2. Faculty Interview Themes

4.2.1. ICT Readiness. The theme *ICT Readiness* refers to the preparedness of the faculty members in effectively delivering online classes at the beginning of the lockdown. Some of the key findings on ICT Readiness were:

(a) ICT readiness of faculty members can be characterized as average. Only two institutions out of 10 had subscribed to online collaboration platforms prior to the pandemic (free for education accounts) and very few faculty members had prior exposure to such platforms or teaching online.

(b) Google Meet emerged as the platform of choice for delivering online classes during the pandemic followed by Zoom and Microsoft Teams. The faculty members found it challenging to replicate the effectiveness of physical classroom teaching.

4.2.2. Training Needs. "Training" emerged as a major theme during the interviews. While faculty members were able to deliver lectures after taking remote help from colleagues and their institution's IT team, several faculty members had issues in setting up their online classes and delivering a seamless experience to their students during the first month. Some of the key findings related to the training needs of the faculty members were:

(a) Most of the faculty members felt that formal training for conducting online classes was needed, while a few felt it was not necessary and it was as easy as learning to use a mobile application.

(b) Faculty members wanted their institutions to subscribe to premium versions of online teaching platforms as free versions offered restricted features.

(c) Most of them also mentioned that a focussed training on conducting online assessment and evaluation was required.

(d) Some of them felt that they must be trained on enhancing engagement levels in the online teaching through the introduction of new collaborative tools or mobile applications.

4.2.3. Workload and Stress. Enhanced workload and stress during the lockdown were another theme which emerged from faculty interviews. Many faculty members had to create digital content (compared to a chalk and talk methodology earlier), set up classes, coordinate with the students on a daily basis, evaluate assignments in an online mode, conduct online examinations. Thus, a significant increase in screen time was reported. The key findings are summarized below:

(a) An overwhelming majority of the faculty members felt that the online mode of teaching–learning increased their workload significantly.

(b) Several faculty members indicated that they felt increased levels of stress during the lockdown. Primary reasons cited were fears of loss of job and salary cuts (private sector), health concerns of self and family members, and additional work at home. Women faculty members indicated that their daily domestic workload increased significantly during the lockdown due to nonavailability of domestic help.

4.2.4. Recognition. Majority of the faculty interviewed felt that during the pandemic they were not appreciated enough by the management of their institute for putting extra efforts

TABLE 2: Thematic analysis of faculty discussions.

Themes	Subthemes	Description	Instances
1	ICT readiness	Resource/ tools/platform availability	"Our college had no clear strategy or subscription to platforms for online delivery of classes. We wasted a lot of the initial time in figuring out how to ensure academic continuity for students." "It was very difficult to coordinate with students on a daily basis. I used WhatsApp groups for coordination and Google Meet for online classes. It took me 2–3 days to get comfortable with taking classes online."
		Resource/ tools/platform familiarity	"I had never conducted an online class before the pandemic. I found it difficult to set up the classes on my own. There was no technical support available during the initial days. I felt I was going through the motions." "I am a mathematics teacher and use to whiteboard a lot during my classes. When I moved to online mode I found it very difficult to do justice to my subject. My college advised me to procure a pen-tablet, which I did. It took some time to get used to, but I could then write and solve maths questions for the class."
2	Training needs	Technology training	"While power point slides were easy to run, writing and solving problems was a major challenge. It took me some time to figure out using the pen-tablet to write and explain concepts to the students." "I did not have any experience on how to use any kind of platform for online classes. This training should be provided for at least one week days by the institutions. Only then can they expect faculty members to deliver quality." "My institution does not place emphasis on the use of ICT and hence we could not deliver good classes to students during the first two months. Initially we only shared handmade notes over whatsapp."
		Pedagogy training	"Conducting online evaluation was very challenging. We used Google Forms, but the examination was too easy and MCQ based. I don't think the teachers were trained properly on conducting online assessments. It is definitely needed." "My institution is very progressive in terms of ICT adoption and we had all the systems in place at the time of the lockdown. Within the first week we received instructions to deliver online classes, and everything was handled smoothly. Now we are talking about experimenting with pedagogy and virtual labs to deliver enhanced experience to our students." "Online teaching is very different, there is no real-time feedback. I need training on how to conduct classes effectively and build engagement with the students."
3	Workload and stress	Work–life balance	"It was difficult to work from home. I had to cook, clean, manage the kids and the family. It was difficult to focus professionally with everyone around. I did not have a private space to myself to deliver classes effectively." "I definitely felt overloaded with work during the first month with the purely online model of delivery. There were things to be learnt, new processes to be adopted and preparation time for lectures increased quite a lot." "While I used ICT in my face-to-face classes, I had to prepare slide decks as per my lesson plans for all my classes which took a lot of time."
		Fear and anxiety	"I was down with Covid and had to take leave for 3 weeks. The post covid recovery was also slow and I was very anxious about my health. I probably did not do justice to my teaching assignment during this period and contemplated quitting my job." "The lockdown period was very stressful. We were hearing bad news all round. Several of my friends reported job losses and salary cuts which weighed heavily on us. I felt I was under pressure throughout this period."
		Uncertainty	"I was surprised at the reaction of the students and parents when they refused to pay the fees to the institution for delivering online classes. We were not sure whether the institution would be able to pay the salaries on time."
4	Support and recognition	Assistance received from the institution in delivering online classes	"I felt that there were too many instructions issued by the management without realising the tough environment and pressures on the faculty. I think the empathy was missing." "All the faculty did a fabulous job, but the management felt that working from home is not equivalent to a full-time office job." "Our management reduced the salaries by 40%–50% during the pandemic citing lack of payment of fees by the students. I felt cheated and felt it was morally wrong to reduce salaries in an already tough environment." "Our work was getting recognized through the internal stakeholder communication platform created to disseminate information. All the lectures recordings along with lecture content was being shared which helped us in sharing best practices. Overall the morale was good."

TABLE 2: Continued.

Themes	Subthemes	Description	Instances
5	Teaching–learning effectiveness	Quality of the classroom teaching	"I am not very satisfied with the quality of classes I have conducted. I believe that online classes should be of shorter duration with more assignment-based learning for the students." "I think I completed only 65% of the curriculum during online classes, so the students have learnt less during this time. They were also not very serious during online classes." "Students didn't respond much during the online classes. This may be due to their lack of interest or engagement in other activities simultaneously. Many a times I found students switching off their cameras and not being around." "Online examinations were a sham. The multiple-choice questions were too easy with very high student scores. The system was severely compromised."

in switching to the online mode and coping well in the virtual mode. Some faculty members were further of the opinion that they had to work extra from home with extended hours of work and managing both the family as well as online work was a very tedious task. A few faculty members said that they preferred the online mode and would be happy to permanently teach from home due to the additional time savings.

4.2.5. Online Class Effectiveness. While online delivery of classes was hailed as a positive indicator for technology adoption by the institutions, faculty perception during interviews indicated mixed reviews. Initially, faculty members felt that it was a novel experience for them. Then they started experiencing fatigue and lack of motivation due to muted student feedback and engagement. They felt that they were not able to connect well with all the students. Finally, some faculty members felt that online classes were a nuisance and reported instances of student misbehavior and background noise as major irritants. Some major findings on online classes' effectiveness are summarized below:

(a) Student disengagement was evident
(b) Online evaluation was not effective
(c) Teaching–learning lacked academic rigor
(d) Small class sizes of 20–25 were the most effective with cameras of all students switched on
(e) Frequent engagement through polls, quizzes, and use of pen-tablets boosted class engagement

4.2.6. Challenges. From the interviews conducted with the faculty members of various institutes in higher education several challenges emerged, which are described below:

(a) **Conducting Labs:** Faculty members identified conducting labs as another major challenge. The computer science faculty members were able to conduct their labs online by accessing online coding tools or sharing screens and executing programs. Faculty members from other departments such as civil and electrical expressed their inability in conducting labs effectively. Conceptually some concepts could be explained using virtual labs, but the physicality of the labs was found to be irreplaceable. As a result, practical learning was a major causality of online teaching during the pandemic.

(b) **Evaluation and Assessment:** Evaluation and assessment part was a major challenge for the faculty. They felt that the assessment options were limited to quizzes and MCQs. Subjective questions and those requiring mathematical formulae to be written could not be given as part of the online tests unless paid online assessment tools were used. Monitoring students and ensuring fairness in the online exams was a major limitation. Institutions did not adopt online proctored frameworks for online examination. Faculty felt that the sanctity of the evaluation process was significantly diluted and the process was unfair to the top students.

(c) **Accessing and Leveraging Digital Resources:** While faculty agreed that there were a lot of digital resources on offer for free, they were not able to leverage all resources effectively. Most of the time was spent in exploring digital resources and examining its suitability in their respective courses. However, many institutions in the region lacked awareness about the digital resources on offer and were not able to utilize them to enhance student learning. Many institutions lacked a coherent plan of engaging students in an online mode. The faculty felt that the students did a better job in self-paced learning with a majority of students completing multiple courses on Coursera, NPTEL, etc. Faculty members also attended several webinars and completed online courses including industry certifications.

(d) **Online Classroom Effectiveness:** Faculty members felt that online classes should not be more than 30 min as students tended to lose focus and attention. Further, it was very tough to gauge student interest in real-time, especially for large class sizes. The teachers felt exhausted themselves and found it tough to keep themselves motivated. Some faculty members who adapted to online teaching and reported using online polls and quizzes and engaging students in discussion, etc. reported better engagement. Hence, teacher training for delivering effective online classes emerged as a major theme during the interviews. A significant majority of the faculty still felt that online-only classes are not sustainable in the long run.

4.2.7. Student Interview Themes. Five themes emerged in student interviews which were labeled as "ICT Readiness," "Online Learning," "Exam Readiness," "Value Perception," and "Stress and Mental Fatigue." These themes were

TABLE 3: Thematic analysis of student discussions.

Themes	Subthemes	Description	Instances
1	ICT readiness	Device and connectivity	"I wish I had invested in a good quality laptop and a broadband internet connection. During the stringent lockdown I could not access high quality content and effectively attend classes. It is absolutely essential during these times." "I had to go to a friend's house during the lockdown to take my exams. The internet service provider did not serve my area and I faced repeated disconnections over mobile internet."
2	Online learning	Self-paced learning vs. online classes	"I really enjoyed exploring the latest courses from coursera, the lessons were short and to the point and I could complete four courses online during the pandemic. Our institution provided free access to Coursera during the lockdown, which was very useful." "The online classes seemed novel at first, but quickly became boring. It was tough to sit through looking at slides and hearing the faculty members for extended periods of time. Only few faculty members could make classes interesting." "I completed 2 industry certifications during the lockdown. There are so many interesting channels to learn online based on your learning level and interest."
3	Exam readiness	Work–life balance	"There is no need for final examinations as the entire syllabus was not completed. Why is the college insisting on exams during such a crisis? All students should be promoted to higher semesters without exams." "The University is planning to conduct exams for final semester after so much delay. It is not possible to prepare well under such stress. We are not sure whether we can appear in online exams without problems."
4	Value perception	Quality of instructional delivery, engagement and perceived value	"Colleges have no right to demand fees when students did not attend classes, labs or use the college facilities." "I personally feel that colleges should reduce their fees and understand that everyone faced loss of income during the pandemic. Online classes are not the same as physical classes." "Online classes were just an eyewash. We did not gain much during the period." "Our college did not even deliver online classes during the period. There was no schedule and faculty would send out a WhatsApp message to a few students for conducting classes on short notice. The classes did not add any value and hence the college should also not charge fees." "The faculty worked hard to deliver classes and the institution organized several workshops, trainings and value-added courses. I got a lot of time to build my skills."
5	Stress and mental fatigue	Uncertainty, anxiety, excessive screen-time and boredom	"My eyes started to hurt with increased screen time. Online classes are not sustainable." "It is difficult to concentrate with so much uncertainty around examinations. Even the teachers are not sure what will happen." "I am bored of online classes, I switch off my camera and carry on with my tasks." "My entire family got infected, we saw some very anxious times, I did not attend classes for a month."

interrelated and interdependent and not entirely independent of each other. The thematic analysis is presented in Table 3.

4.2.8. ICT Readiness. During student interviews, it emerged that 64% of students had laptops/desktops at home with wi-fi connections. Others used mobile phones over mobile internet to attend classes. The socioeconomic constraints in J&K are real. The lack of availability of a laptop/computer and good internet connectivity emerged as a major hindrance in effective teaching–learning. The reluctance of some students to invest in a computer and internet for their own benefit was quite surprising. The situation was also exploited by the students. Initially, the students were opposing online examinations. Once they realized that the online examinations were much easier they reversed their stand and protested across several institutions to conduct examinations in an online mode only. The students were indeed very complacent during this period and expected major concessions from the system. Thus, the academic loss for the students has been real during the past year, especially in institutions where student disinterest was matched by lack of energy by the institutions and faculty members.

4.2.9. Online Classes vs. Self-Paced Learning. Students indicated mental fatigue with online classes after a while with many indicating that they just join the class and do not pay attention during it. Further, the students indicated that they enjoyed undertaking self-paced courses on online platforms and took to such platforms very enthusiastically. In one of the institutions, students had undertaken over 250 different courses on Coursera with over 10,000 h of lessons. This is a worrying trend for institutions as students indicated fatigue with online classes, but enthusiasm for self-paced learning. Clearly quality and pedagogy for online delivery of classes need to be revisited by the faculty and the institutions. Further, the gamification used by online platforms attracted the students in enrolling for courses and completing them. Students believed that such online courses added value to their resumes. The institution which enrolled for the Coursera initiative and provided access to the students, generated significantly positive student sentiment as evident from student comments on social media. Further, institutions which rapidly adopted online platforms and provided academic continuity to the students were much appreciated by the students

TABLE 4: Summary of responses from educators and institutional leaders.

Educators		Institutional leaders	
What did not work	What worked	What did not work	What worked
(i) Recorded lectures (ii) Whatsapp groups and material sharing (iii) Self-paced learning of course material shared with students (iv) Online lectures of 1 hr duration with slides (v) Using only slides to deliver content (vi) Students not switching on their cameras during classes (vii) Lack of communication from institutional leadership (viii) MCQ-based assessment using Google Forms leading to unfair means (ix) Free online tools with basic features (x) No physical laboratory access and experimental work (xi) Working with the whole class always (xii) Group interactions and communication	(i) Live classes (ii) Structured and formal online classes (iii) Learning through MooCs, especially Coursera (iv) 30–40-min lectures with frequent polls and quizzes (v) Using pen tablets for writing/drawing (vi) Students switching on their cameras during classes (vii) Clear institutional vision, communication, and directions (viii) Online proctoring-based tools, oral exams, open book exams, assignments (ix) Paid subscriptions with premium features (x) Use of V Labs, videos by faculty while using actual labs (xi) Working with small breakout groups (xii) Individualized mentoring, counseling sessions	(i) Individual faculty tool usage (Whatsapp, Zoom, Gmeet, etc.) (ii) Faculty communicating with students through Whatsapp groups etc (iii) Effective tool usage by faculty on their own (iv) Informal training on teaching online (v) Pedagogy innovation by faculty (vi) Monitoring of quality of online lectures (vii) Google forms-based assessment (viii) Lack of engagement with student groups/faculty by institutional leadership leading to communication gaps (ix) Use of free online tools and treating the pandemic as a temporary phase (x) Rigid control and strict monitoring (xi) Traditional management and planning (xii) Outsourced IT teams and reliance on outside training agencies (xiii) Long-decision-making cycles	(i) Central unified strategy and platform usage at institution level (ii) Clear unambiguous communication through formal channels like emails (iii) Centralized online training for faculty (iv) Formal training and certification (v) Training for faculty on building engagement (vi) Enabling recording of lectures for review (vii) Online proctoring-based assessment (viii) Institutional leadership frequently engaging with and addressing concerns of student groups and faculty members (ix) Investment in building online delivery capability as a strategic investment (x) Flexible policies and understanding empathy (xi) Strategic planning, management, and execution (xii) Inhouse IT and ICT expertise with training capabilities (xiii) Agile decision-making and responsiveness

generating significant brand differentiation compared to institutions which did not.

4.2.10. *Exam Readiness.* There was a lot of resistance from students across institutions to appearing in final examinations. Students felt that mass promotions should be the norm under such exigent circumstances and were quick to point out the inadequacy of online classes.

4.2.11. *Value Perception.* A majority of the students felt that colleges did not deliver full value during the pandemic. Many felt that since they could not use the college facilities and the colleges did not incur any expenditure during the period, the fee should be waived off. Students strongly felt that the colleges should not charge any fees during the period of the lockdown. There was a lot of resentment among the students when the colleges raised the demand for fees during July–August at the time of starting of the next semester.

This feedback correlated with colleges reporting reduced fee realization from students during the period resulting in delays in paying staff salaries. A majority of the students paid their fees after delays and multiple follow-ups. It was interesting to note that while students felt that online classes were of not much value; however, the absence of online classes was in fact considered a deficient service by students. Hence, the absence of online classes was viewed very negatively by the students. Colleges which did not provide online classes received student backlash and subsequently poor admissions in the next cycle of admissions. Colleges which delivered online classes effectively and conducted examinations on time reported higher admissions and increased brand/value perception.

4.2.12. *Stress and Mental Fatigue.* Toward the end of the second wave, students reported mental fatigue with online classes, webinars, meetings, etc. Many reported excessive screen times and lack of concentration. This represents a major challenge for online-only delivery models. It is intuitive here that an online only model works well when the learning is self-driven and self-paced. Running scheduled classes throughout the day and for extended periods has resulted in mental fatigue setting in for the students.

Research Question 2: What strategies work at the level of the institution and the individual educator in creating a favorable stakeholder perception?

To answer research question 2, interviews were conducted with 15 senior educators and 10 institutional leaders to determine which strategies/interventions worked and which did not work while delivering online education during the pandemic. The responses are summarized and tabulated in Table 4.

Some of the themes that emerged from the interviews with institutional leaders included adoption of formal strategic planning, investment in IT/ICT, setting up formal and informal communication channels with stakeholders and communicating frequently, agile decision-making and responsiveness to stakeholder concerns, supporting faculty through formal trainings, equipping them with required resources, and treating the online model/blended delivery model as a long-term trend in education. The educators surmised that short lectures, frequent polls, use of multimedia content, quizzes, use of pen tablets, oral examinations, and working in small groups increased the effectiveness of online learning. These outcomes clearly indicated the need for deep engagement model going forward as a blended online delivery model may be new normal in the education industry.

5. Conclusions

The present study has revealed some interesting insights into the perceptions, attitudes, and experiences of faculty and students at higher education institutions in the Jammu region related to online classes during the lockdown.

Empathetic leadership is also the need of the hour to navigate through uncertainty and stressful times. Our research shows that leadership intent, resource provisioning, faculty support, intensive faculty training, student orientation, easing out assessment and evaluation and working in small groups can help institutions deliver value to students in these challenging times while enhancing institutional brand value. Faculty members need to invest in themselves and assume responsibility for generating the needed energy and interest in online learning through the use of modern tools, animation, videos, quizzes, polls and individual student engagement. Students need to be primed to receive the benefits from the online delivery model and exerting the required pressure on faculty and institutions to deliver value. This is a great time for proactive institutions to innovate and use digital technology to expose students to world-class content and resources. Such institutions have benefitted by creating a value differentiation while the decline of laggard institutions has been hastened. Technology in education has its own set of advantages and disadvantages, but with effective implementation, the disadvantages can be minimized. A better plan is required. In order to be one of the world's most competitive countries, schools/colleges must expand and develop their educational systems in accordance with Industry 4.0. When opposed to the previous technique, Education 4.0 allows a learner to better understand the learning settings [18–23].

Data Availability

The data available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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