An exploratory assessment of the educational practices during COVID-19

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Abstract

Purpose – This study aims to address the state of teaching-learning during the COVID-19 pandemic by assessing the pedagogies used, evidence collected, best practices used and technologies used for instruction by the academics in higher education institutions (HEIs). This study also analyses the impact of online academic motivation (OAM) and online academic amotivation of the teachers on the online student engagement (OSE) during the emergency remote teaching (ERT) period.

Design/methodology/approach – This study uses a mixed methodology by incorporating both qualitative and quantitative methods for analysis. Data used in this study have been drawn from a pool of educationists teaching in various HEIs in different parts of India (n = 900). Sentiment analysis, project map and mind map have been used to analyze the teachers' experiences in the new teaching environment. Further, this study uses exploratory and confirmatory factor analysis and path analysis to measure and validate the study's scales.

Findings – The combination of empirical and qualitative analysis captured the ERT model followed by the teachers. The overall experience of teachers regarding the online mode of teaching-learning is moderately positive. This study reports a direct positive and significant impact of teachers' motivation on perceived student engagement in the online mode.

Originality/value – This research proposes and validates scales to measure perceived OSE and the teachers' OAM. This study also establishes an impact assessment of the teachers' motivation levels on the students' engagement from an educator's perspective.

Keywords Stress, Surveys, Perception, Quality assurance, Validation, Higher education, Online student engagement, Online teachers' motivation, Pedagogy, COVID-19 pandemic, Online teaching-learning, Sentiment analysis

Paper type Research paper

Introduction

The world today is witnessing the overwhelming consequences of the COVID-19 pandemic in every aspect of human life. It has impacted health, employment and education. Higher education institutions (HEIs) are no exception and are witnessing a massive shift in the educational paradigm. Universities and colleges are repositioning teaching from physical campuses to remote learning via online methods. This new paradigm shift in teaching brings novel challenges that need expert advice and a concerted effort from all the education

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sector stakeholders. This study aims to understand the various facets of online teaching-learning during the pandemic period.

The emergent lockdowns for an indefinite time have created an abrupt rise in students' and teachers' stress levels. The institutions across the globe were tasked to devise new ways to instruct students and, in the process, ensure minimum disruptions. The apex institutions for every country, namely, education ministries, and also United Nations Educational, Scientific and Cultural Organisation (UNESCO) suggest using flexible pedagogies. To provide the students with short recorded videos, furnish case studies and problem-solving assignments in line with the existing syllabus ensures continuous learning (World Bank, 2020). Educationists suggested using online applications for teaching students online (Ramamoorthy, 2020). Researchers reported that the online platforms could reduce the anxiety of worried students (Wang and Zhao, 2020) about completing their education and getting a job, especially those in the last semester of undergraduate and postgraduate studies. In this research, we propose to capture some of the best practices that the academicians followed to teach during this uncertain period:

RQ1. What were the best practices adopted by the teaching community during the emergency remote teaching (ERT) period?

The recording of evidence, i.e. the complete documentary proof of the teaching-learning process, is pivotal for teachers' use as it helps them establish their teaching and learning role. This recorded evidence provides an objective criterion to determine the number of students attending the class, the sum of classes held to complete a section of the syllabus and the time spent in the process. The ERT mode (Hodges *et al.*, 2020), coupled with a short span of a student's concentration to understand and grasp a topic (Ellah *et al.*, 2019), created havoc among students. This sudden drift to online mode accompanied by a lack of online teaching experience, instructional material or technological support has made it an arduous task for the teachers (Bao, 2020). The lack of resources, internet bandwidth and hardware hurdles at the student's end also create constraints for a smooth teaching-learning process.

To tackle this limitation, software such as Microsoft Team or Google Classroom helps the teachers collect and systematically store evidence of teaching. The students can then revisit the concepts taught during the online class later. Thus, we propose to study the methods adopted by teachers in storing evidence for the online sessions held and accordingly formulate the following research question:

RQ2. How are the teachers recording evidence of teaching and learning during the COVID-19 period?

It is imperative to understand academics' teaching experiences during the pandemic period, as it may help the policymakers make objective decisions later. Further, it becomes a guide and a lesson to tackle the challenges faced by them. Teachers have a direct impact on the learning process of the students. Ziebell *et al.* (2020) find that the teachers are incredibly stressed and find it hard to balance online teaching and personal life. Teachers' high expectation of continuing just as they have been doing in the face-to-face teaching mode has put them in fear of losing their jobs (UNESCO, 2020). The students' family's constant and critical review of the teachers' pedagogy has been problematic, not to mention the difficulties traversed on online noise and the environmental setup. Therefore, we propose to study the experiences of the teachers during the COVID-19 period:

RQ3. What were the experiences of teachers during the period of non-face-to-face teaching environment?

The motivation of educators is pertinent to ensure effectiveness in the teaching-learning process. A motivated teacher's role becomes all the more relevant when an unanticipated situation surfaces (Calleja and Camilleri, 2021). A motivated teacher will encourage and engage a student in the teaching-learning process effectively (Cruickshank and Mainsbridge, 2021). Conceptually, teachers' motivation is measured through social learning theory (Rotter, 1966), self-efficacy theory (Bandura, 1977; Bandura *et al.*, 1999) and self-determination theory (SDT) (Deci and Ryan, 1985). SDT is related to augmented psychological performance (Deci, 1980). While intrinsic motivation leads to higher and positive performances, extrinsic, forced and amotivation lead to adverse work outcomes (Fernet *et al.*, 2008; Gagné and Deci, 2005). In this study, we propose to examine the various motivators during trying times like this and thus formulate the following research question:

RQ4. What aspects of teaching-learning motivate the teaching community during the COVID-19 period?

The current pandemic has brought many difficulties for the teachers, with a sudden shift to the online teaching model. Student engagement is a significant concern and a serious challenge for a teacher in the present times. Students' emotional, behavioral and cognitive connection to their study that influences their success and learning explains student engagement (Kahu *et al.*, 2014). Student engagement literature proposes that online education achieves desired outcomes such as competence, critical thinking and student satisfaction (Trowler and Trowler, 2010) through a systematic and suitable pedagogy. Previous studies postulate that several factors, namely, the institution's role, pedagogy and infrastructural facilities (Kumar and Arora, 2017), may lead to higher student engagement. Although there exist studies on explaining student engagement through online mode of teaching (Buck, 2016; Delahunty *et al.*, 2013; Farrell and Brunton, 2020; O'Shea *et al.*, 2015), this unprecedented scenario questions it, and thus we propose to study the following research question:

RQ5. What is the current state of engagement of students in the online teaching environment?

Teachers' motivation and engagement of students

The online pedagogy literature accentuates the prominence of teachers' motivation and student engagement (Everett, 2015; Meyer, 2014). These are not new concepts in academics, yet their relevance is augmenting as the academic world is shifting to online modes of teaching owing to the pandemic. Among its various definition of student engagement, the present study defines it as defined by Glossary of Education Reform (2016). According to them, student engagement refers to the degree of inquisitiveness, interest, positivity and zeal expressed by the student while learning. Previous studies have established a direct relationship between the teachers' motivation and teacher engagement and satisfaction (Levesque *et al.*, 2004). Previous research has also found a direct association between teacher motivation and student engagement (Pelletier *et al.*, 2002). Previous studies claim that higher faculty engagement may lead to higher student engagement as the faculty member would harness their abilities to make learning enjoyable (Kumar, 2013). Given the current state of affairs amidst the pandemic, it becomes imperative to study the possible linkage between teachers' motivation and student engagement in a non-face-to-face learning environment.

We posit that the HEIs will take care of the fundamental problems of network and internet connectivity for making online teaching conducive. However, we believe that the successive pedagogy and the teachers' motivation to instruct in an online environment would enhance student engagement.

Little research attempts have been made to understand teachers' motivation for student engagement levels in an online instructional environment. Therefore, this study's rationale is to familiarize the HEIs with the process in which the teachers would be able to motivate themselves in extreme situations such as this with competent use of information and communication technology closely guarded by scientifically designed and integrated pedagogy. According to SDT, the teachers' motivation may be on two grounds: the teachers' assessment of the value attached to the work or personal endowments keeps them motivated. Second, when there are external motivators or sources of control (Fernet *et al.*, 2008). Initially, a teacher can remain motivated for online teaching by getting extrinsic rewards, but the teacher requires intrinsic motivation for continued motivation (Johnson *et al.*, 2013).

It is pretty tricky for the students to engage in an online environment, as they require multiple engagement points for expressing their social presence. There are factors such as learning barriers, skills, career path and motivation to complete study that impacts student engagement (Shah and Cheng, 2019). There is a significant decline in student engagement when students take online instructions (Shah and Cheng, 2019). A motivated teacher's role in supporting, engaging and retaining the students in an online environment should be studied and documented. Previous researches on student engagement confirm that teachers can help their students online through prompt and embedded support, thereby establishing personal presence and enhancing their engagement level (Rose, 2018; Stone and O'Shea, 2019). Therefore, teachers would play a significant role in augmenting the student engagement levels in online mode, primarily because they are the only link between institutional learning setup and the students. Studies have established the influence of regular student–teacher interactions on student engagement (Jang *et al.*, 2016; Nguyen *et al.*, 2018; Quin, 2017). We propose that a motivated teacher providing instruction in the online mode would improve the student engagement levels. Therefore, we posit to study the linkage between the teachers' motivation and student engagement and conceptualize the following research question and hypothesis:

RQ6. What is the relationship between teachers' motivation and student engagement in an online learning environment?

H1. There is a significant relationship between teachers' motivation and student engagement.

Method
Procedure and participants
The present study follows a mixed-method approach where we have used both qualitative and quantitative data to reach an in-depth comprehension (Thaheem *et al.*, 2021). Data used in this study have been drawn from a pool of educationists teaching in various HEIs in different parts of India. We devised a structured survey to find the teachers' motivation and perception of student engagement during the pandemic. We collected the data from August 2020 to November 2020. We selected the participants by following inclusion criteria, namely, engaged in teaching students in HEI and currently engaged in the online teaching-learning process. We disseminated the survey by creating it on a google form and sending it across

the university system repository created by the Teaching Learning Centre, Ramanujan College, University of Delhi. We used the generated link to send out the survey form to 2,600 teachers randomly selected from the repository. With a response rate of 39.80%, we got a response from 1,035 participants. We removed the incomplete responses and outliers from the data set. The participants consented to participate in this research study; we gave the respondents an option to opt out of the survey. We have observed all the ethical guidelines concerning data collection. A total of 900 teachers (473 female, 425 male and two preferred not to disclose the gender) were used for further analysis. The participants' mean age was 38.69 (SD = 6.721), ranging from 23 to 61. The data set represented all the states and union territories of India, with the highest participation of 160 teachers (17.8%) reported from the Indian state of Maharashtra, followed by Kerala, Tamil Nadu and Uttar Pradesh.

We have also conducted interviews to get a general idea about the current realities of non-face-to-face education across India. The interview method helps understand individuals' perceptions and realities that aid in research (Jaiyeoba and Haron, 2016; Rubin and Rubin, 1995). A total of nine teachers (five females and four male) were interviewed. We have used various online platforms such as Google Meet, Zoom application and WebEx application conveniently to have a face-to-face interaction with the interviewees. Each interview spanned around 45–60 minutes. The interviewees were from the Indian states of West Bengal, Haryana, Bihar, Karnataka, Odisha, Tamil Nadu, Chattisgarh, Uttar Pradesh, Kerala and Delhi, teaching subjects like commerce, chemistry, psychology and biotechnology.

Measures

The Scale of Student Engagement was adapted from the study of Gunuc and Kuzu (2015). We modified seven items from the behavioral engagement scale of Gunuc and Kuzu (2015) to align with the study purpose. We included three items on this scale to measure the participation, assessment and noise (disturbance) parameters in an online teaching-learning environment. The items using the seven-point Likert scale (1 = strongly disagree, 7 = strongly agree) measured the teachers' perception regarding their students in an online teaching environment.

The Teacher Motivation scale was adapted from the study of Fernet *et al.* (2008). We have used a 15-item scale measuring intrinsic motivation, identified regulation, introjected regulation, external regulation and amotivation. The items were substantially modified to attune them according to the online teaching-learning environment and were measured on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). For instance, for intrinsic motivation, one item originally read, "I like doing this task," was modified to "I like teaching my students online." We changed the scale by getting it reviewed by a panel of experts comprising seven professors working in HEIs for a minimum period of 20 years. The review's primary objective was to establish the modified scale's face validity; the panel reviewed the scale by meeting twice over the online platform (Cantrill *et al.*, 1998; DeVellis, 2016). The forum did the validity assessment on each indicator and suggested some changes to the presented statements.

Based on the research questions, we have also used three open-ended questions to assess the participants' responses qualitatively, namely,

(1) What initiatives/best practices have you implemented to manage teaching and learning in the COVID-19 period?

(2) How are you recording the evidence of teaching and learning during the COVID-19 period?

(3) What is your experience of teaching in an online mode?

Results

Qualitative analysis

RQ1. What were the best practices adopted by the teaching community during the ERT period? The project map (Figure 1) constructed with NVIVO 12 plus software shows the academics' various initiatives to teach students online. The ten interviewees selected across India reported some of the teaching aids employed by teachers for effective teaching-learning. The project map suggests that the interviewees have used similar tools and teaching aids to render their classes. The figure's right side shows that the interviewees exhibit various online modes of teaching during the pandemic. The outer circles represent multiple modes of online instruction as suggested by the interviewees, and the inner circles represent the ten interviewees. The arrows connote the inter-relationship among the various methods and their use by the interviewees. Some software and platforms prominently used are Google classroom, Zoom application and WebEx application to interact online. The academics interviewed also mentioned using PowerPoint presentations, reading notes compilations and dissemination through PDFs, notifying, collecting assignments through platforms and emails and conducting various mock tests online to complete their teaching assignments.

The left side discusses the relationship between interviewees 1, 9 and 10. The software separately picks this up because of the relationship among their interviews. The participants of the interview also stressed some of the limitations of online learning, namely, lack of a working internet with limited bandwidth, non-availability of laptops/desktops with the students, stress experienced by students due to constant use of phones and laptops and lack of personal contact with the teachers. Following is an excerpt from the interviews conducted that evidence the analysis:

> Online video lectures were conducted through Zoom, WebEx, google meet, etc., for completing the left-out courses of every semester. Online assignments were submitted and Online Quiz Tests (MCQ) was conducted.
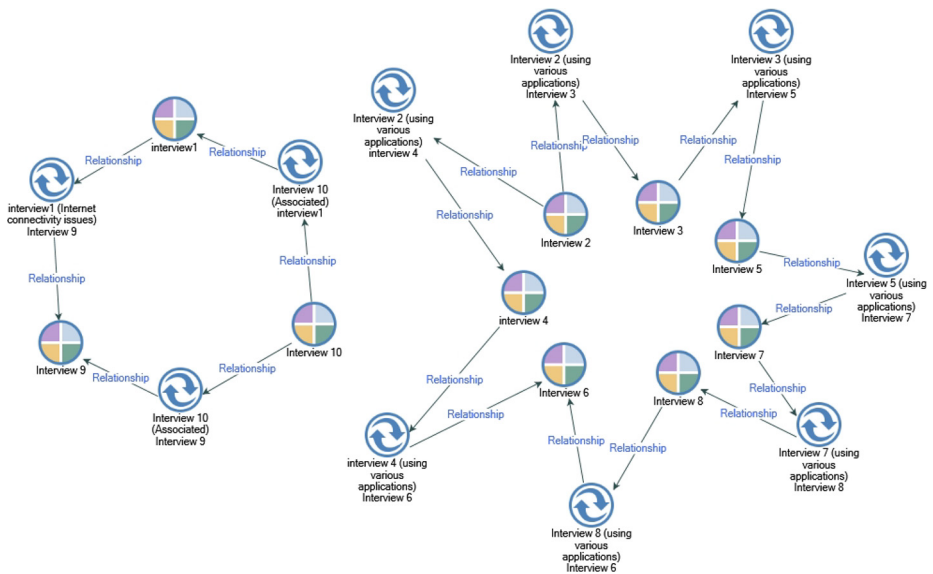
Figure 1.
A project map depicting relationships

I have implemented online teaching and learning process through WhatsApp group, google forms, LMS in Shiksha Setu App, etc. during Covid-19 period.

RQ2. How did the teachers record the evidence of teaching and learning in the COVID-19 period? The collection and storage of evidence is an essential aspect of certification and career advancement. Such pieces of evidence enable teachers to establish facts about their teaching-learning activities. Additionally, the evidence indicates the best practices followed by an academic. When teaching students itself became a challenge in the pandemic times, collecting evidence seemed tricky. Based on the open-ended question asked from the teachers on this aspect, numerous teachers did not collect evidence during the pandemic period. They believed that effective teaching itself became a challenge, and therefore collecting evidence for the same was out of the question. However, some teachers used modern-day tools and teaching aids that had an inbuilt system of recording evidence.

Figure 2 describes a mind map that represents the evidence of teaching-learning through the online mode. Evidence of teaching during the pandemic becomes the parent theme here. The map suggests that the articles like assignments focus on applications like google classroom, YouTube, Siksha Setu, WebEx, WhatsApp and Zoom, as well as manual records in the laptops, and screenshots are the numerous options with the teachers that helped them in keeping a record of their classes.

Table 1 and Figure 3 show the codes' coding percentage formed from the references in the data. Google Classroom is the most accustomed mode of recording the evidence, followed by posting videos by the teachers on their respective institution's YouTube channel. Siksha Setu, an application-based portal launched by the Government of Haryana, is the least preferred mode of collecting the teachers' evidence. The study here presents an excerpt from the interviews conducted:

Keeping certificates and notes in google drive, dropbox, etc., and uploading course materials in google classroom. Keeping meet attendance using chrome extension, etc.
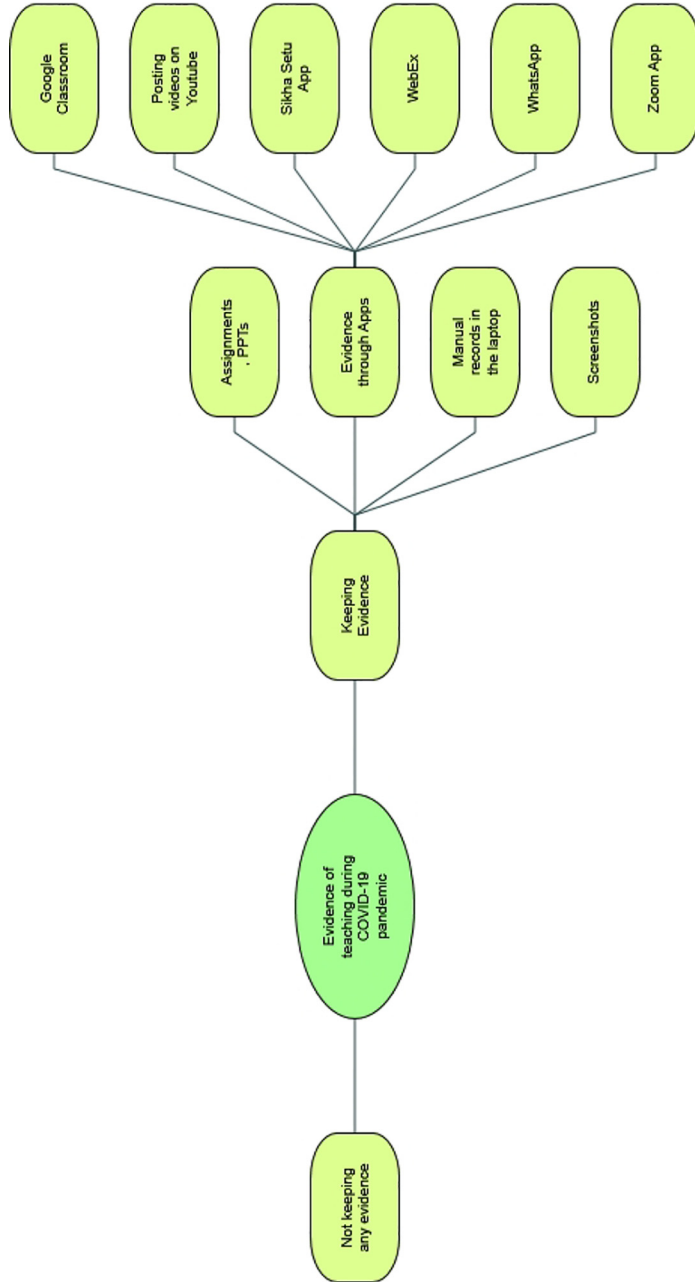
I am not keeping any record because it is all so complex.

Screenshots of online lectures, saving the name of the student who is attending class, filling details in the google spreadsheet.

RQ3. What were the experiences of teachers during the period of non-face-to-face teaching environment? We used sentiment analysis to find out the experience of teachers for teaching through the online mode. Most of the teachers, represented by 288 references from the data, are moderately optimistic about teaching online, followed by the teachers (202 contacts) who are very confident about teaching online. However, the sentiment analysis also reports a relatively high number of teachers who are not appreciative of the online teaching model. These are mainly those teachers experiencing difficulties owing to network problems, students' stress levels or lack of facilities to study without hindrance. (Figure 4).

Therefore, the results point towards a higher positive tone about the non-traditional modes of teaching-learning. Nevertheless, we should understand that academics make a big difference in the students' lives; therefore, a negative view about the online teaching-learning method even by few teachers may indicate a more significant problem. Following is an extract from the interviews about their experiences during the period of non-face-to-face teaching environment:

Not good experience compared to traditional lecturing special reference to the physical absence of students.

If all students and teachers are equipped with proper internet facility and other resources it is better to continue in an online teaching mode during this covid-19 period. But online teaching shall not be a substitute for classroom education.

It is interesting. New avenue of teaching and learning is there for both teachers and students. But sometimes due to lack of thorough technical knowledge, I feel it is a bit complicated too.

Mode of evidence of teaching and learning	Coding (%)
Google Classroom	19.63
Posting lecture videos on the YouTube channel	08.00
Screenshots	07.31
Assignments	05.66
Whatsapp	03.17
Not keeping the evidence	02.61
Manual records in Laptops	01.99
Zoom Application	01.91
WebEx Application	00.34
Shiksha Setu	00.15

Table 1.
Representing
different codes with
their percentages
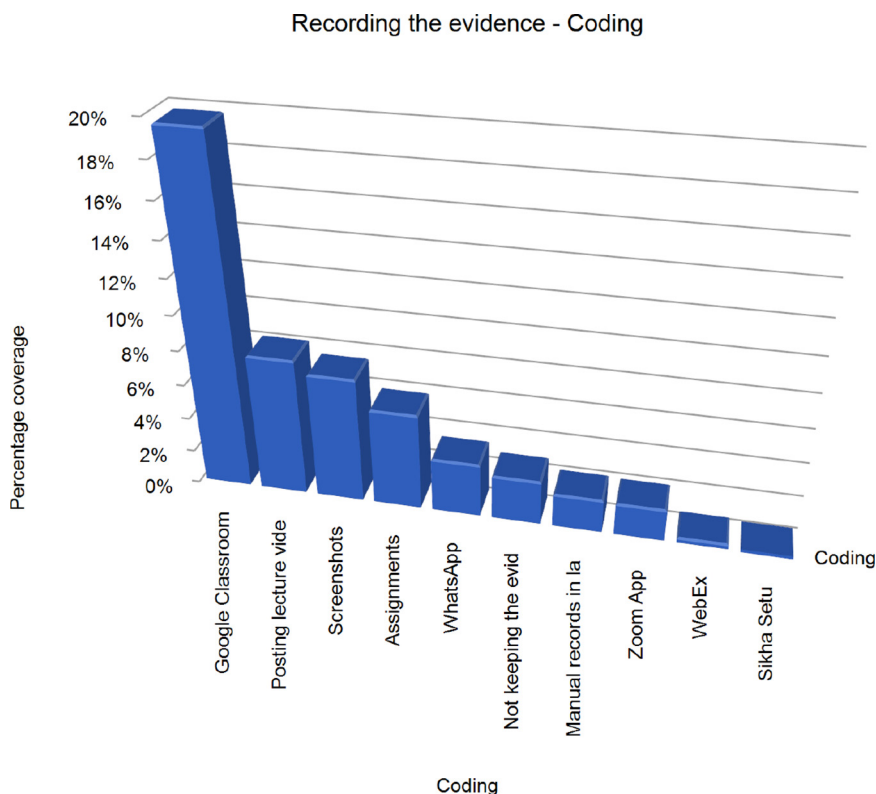
Figure 3.
Graphical
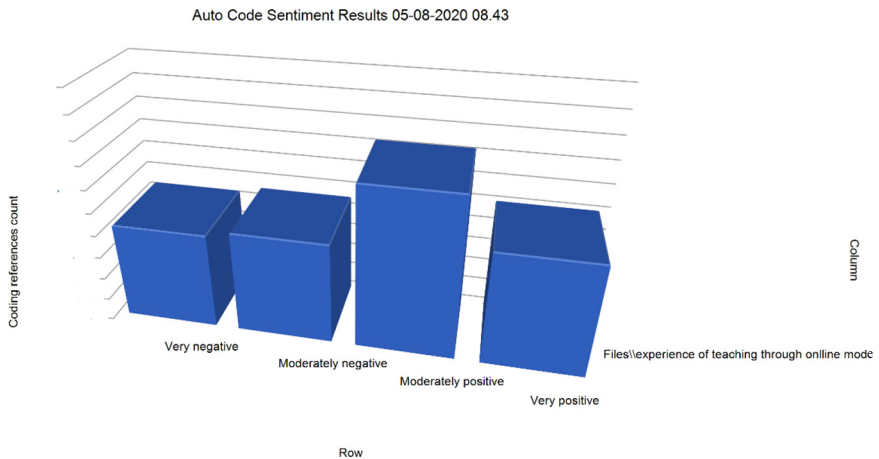representation of the
coding percentage

Empirical analysis
We used exploratory factor analysis (EFA) to provide an underlying structure to the indicators. The sample set $n_1 = 450$ was used for EFA. We used the principal axis factoring method for extraction, and we used the direct oblimin method for rotation. The communality score of most of the indicators reported higher than 0.40, and the inter-correlation matrix also did not report values higher than 0.80 (Field, 2009). The necessary caveats for conducting EFA were adhered to (KMO = 0.917; Bartlett's test of sphericity reported significance at $p < 0.001$) (Hair *et al.*, 2010). The five-factor structure reported a total variance of 62.940%, meeting the Kaiser criterion (Kaiser, 1960). We deleted those indicators having factor loadings of less than 0.50 (McCoach *et al.*, 2013) and those with less than three indicators for subsequent extraction and rotation. The final retained structure had three components labeled as online student engagement (OSE), online academic motivation (OAM) and online academic amotivation (OAA). The factor structure confirmed the rules of item clarity, item representativeness and item contribution to the reliability and inter-item correlation. Table 2 presents the pattern matrix where ten items loaded highly on the first factor OSE with Eigenvalue = 7.789; the second factor OAM has six items with Eigenvalue = 2.334. The third factor, OAA, has three items with Eigenvalue = 1.996.

We have done the reliability analysis by estimating the Cronbach's alpha of each dimension, OSEα = 0.924, OAMα = 0.870 and OAAα = 0.705. The dimensions reported high reliability except for OAA that accounted for moderate reliability (Figure 5).

We further tested the underlying structure through confirmatory factor analysis (CFA) by using a second sample set of $n_2 = 450$. The first round of CFA confirmed the factor structure extracted through EFA and validated the same. At least three indicators have represented all the latent constructs, removing the issue of under-identification (Kline, 2004). We examined the measurement model through the strength and the significance of the relationships; each loading reported significance at $p < 0.001$ (Table 3). The model reported a good fit with χ^2/df = 2.971; CFI = 0.940; IFI = 0.940; RMSEA = 0.066.

The validity analysis shows that two factors, namely, OAM and OSE, reporting no validity issues; however, OAA accounted for marginal convergent validity issue (Table 4), the average variance extracted of a factor should be higher than 0.50 (Fornell and Larcker, 1981). We decided to keep the factor as it depicted no discriminant validity issue and reported satisfactory reliability. Further, OAA shows teachers' amotivation quotient in a

Figure 4.
Graphical representation of sentiment analysis

	OSE	Factor OAM	OAA
1. The students carefully listen to me during online sessions	0.860		
2. The students follow my rules during an online session	0.854		
3. Students attend my online classes willingly	0.846		
4. Students submit their online task on time	0.806		
5. I interact with the students in online mode	0.772		
6. The students remain active during my online classes	0.763		
7. I can clear the doubts of my students during online sessions	0.655		
8. My students do not create disturbance during my online sessions	0.609		
9. The students can work in groups in online mode	0.562		
10. I can assess my students through online tests	0.537		
11. I like teaching my students online		−0.854	
12. I find teaching online interesting		−0.795	
13. It is pleasant to carry out teaching online		−0.719	
14. I find teaching online easier than taking a traditional lecture		−0.693	
15. I get to learn new ways of teaching, so I like teaching online		−0.622	
16. Online mode of teaching is on par with traditional teaching		−0.551	
17. Sometimes I do not see the purpose of teaching online			0.771
18. Earlier I used to know why I was teaching, but I do not see the reason anymore			0.688
19. It is challenging for me to take online lectures			0.529

Extraction method: principal axis factoring
Rotation method: Oblimin with Kaiser normalization
Rotation converged in six iterations

Table 2.
Pattern matrix

new teaching environment, which is an important dimension to measure something that is neither extrinsic nor intrinsic motivation. The composite reliability and MaxR(H) indicate high reliability, and thus, we have retained all the dimensions for path analysis.

Composite score and behavior evaluation
As perceived by the teachers (*RQ6*), the current state of student engagement can now be assessed through the validated scale of summated OSE (Table 5). The teachers' perception regarding student engagement is high, with mean scores pointing to a higher range. Thus, we can conclude that student engagement has increased in the online teaching-learning mode as perceived by the teachers.

The indicators of the validated constructs, namely, OSE, OAM and OAA, are analyzed by testing the structural relationship between the constructs. The path analysis used the aggregate sample set of $n = 900$ respondents. The results depict a significant positive relationship between OAM and OSE originally as per *RQ6* (Figure 6, Table 6). The path analysis reports OAM → OSE (SRW = 0.583, $p < 0.001$), supporting *H1*. Amotivation that corresponds to lower level of self-determination (Fernet *et al.*, 2008) reports low insignificant relationship with OSE (OAA → OSE (SRW = 0.052, $p = 0.105$). The model reported a good fit with χ^2/df = 4.224; GFI = 0.939; CFI = 0.956; IFI = 0.956; RMSEA = 0.060.

We have performed a multi-group analysis to test whether any significant difference is reported *vis-à-vis* gender and state of internet connectivity. We divided the sample set into male ($n = 425$) and female ($n = 473$) respondents. We used AMOS 20 to perform multiple-group analysis, the structural weights for the relationship between β OAM → OSE and β OAA → OSE constrained to be equal for male and female (b1_1 = b1_2; b2_1 = b2_2). The gender groups did not report any difference concerning the structural paths with CMIN = 0.989; df = 2; and $p = 0.610$.
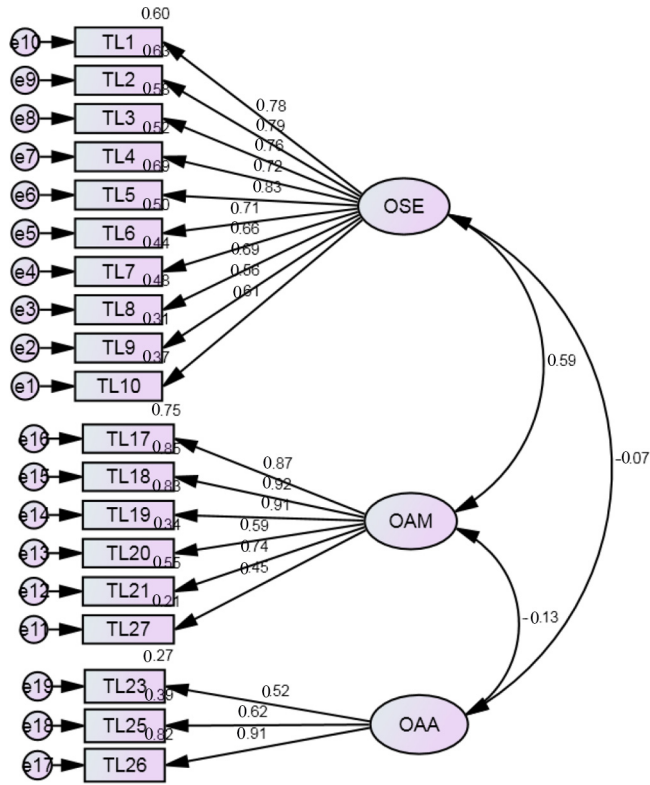
Figure 5.
Confirmatory factor
analysis

For the state of internet connectivity, we created two groups based on the participants'
responses. In total, 29.3% respondents ($n = 264$) reported poor or fair internet connections,
and 70.7% respondents ($n = 70.7\%$) reported good internet connections. We found that the
state of internet connection has no significant impact on the structural relationships,
namely, β OAM $\rightarrow$ OSE and β OAA $\rightarrow$ OSE. The two groups did not report any
significant difference with CMIN = 0.411; df = 2; p = 814.

The final scale with the descriptive and percentage responses of the participants on each
item is provided in Table 7. This analysis depicts the teachers' perception regarding the
students' online engagement level, the teachers' online motivation and the teachers'
amotivation owing to the current existence of a non-face-to-face teaching environment.

Discussion and conclusion

A mass movement to online spaces has put teachers and students in an insensitive
environment. The replication of traditional instructional pedagogies online accompanied by
teachers' inexperience in online mode has put questions on the students' actual learning and
productive education. This situation necessitates a need for transformative pedagogies that
include increased interaction of teachers with the students. The teaching community has
advocated for blended learning methods. Augmenting greater use of technologies by
integrating video or interactive lectures in advance to facilitate online class discussion can
be pictured as supported by this study's results. An educator's task has increased manifolds,

			Estimate	SE	CR	P	SRW
TL10	←	OSE	1.000				0.608
TL9	←	OSE	0.976	0.095	10.219	***	0.556
TL8	←	OSE	1.029	0.085	12.088	***	0.690
TL7	←	OSE	1.293	0.110	11.744	***	0.664
TL6	←	OSE	1.019	0.083	12.310	***	0.708
TL5	←	OSE	1.220	0.089	13.760	***	0.831
TL4	←	OSE	1.244	0.100	12.477	***	0.721
TL3	←	OSE	1.145	0.088	12.951	***	0.760
TL2	←	OSE	1.278	0.096	13.348	***	0.794
TL1	←	OSE	1.257	0.096	13.141	***	0.776
TL27	←	OAM	1.000				0.454
TL21	←	OAM	1.299	0.137	9.476	***	0.740
TL20	←	OAM	1.367	0.160	8.538	***	0.585
TL19	←	OAM	1.782	0.175	10.164	***	0.911
TL18	←	OAM	1.642	0.161	10.199	***	0.923
TL17	←	OAM	1.508	0.150	10.024	***	0.869
TL26	←	OAA	1.000				0.905
TL25	←	OAA	0.723	0.086	8.431	***	0.622
TL23	←	OAA	0.557	0.070	7.912	***	0.524

Notes: SE: Standard error, CR: Estimate/SE, *** $p < 0.001$; SRW: Standardized regression weight

Table 3.
Estimates of the
measurement model

	CR	AVE	MSV	MaxR(H)	OAM	OSE	OAA
OAM	0.891	0.589	0.346	0.940	0.767		
OSE	0.912	0.512	0.346	0.921	0.588	0.715	
OAA	0.735	0.493	0.017	0.847	−0.130	−0.073	0.702

Notes: CR: Composite reliability; AVE: Average variance extracted; MSV: Maximum share variance; MaxR(H): Maximum reliability

Table 4.
Validity assessment

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	SD Statistic	Skewness Statistic	Skewness Std. error	Kurtosis Statistic	Kurtosis Std. error
OSE	900	10.00	70.00	54.3678	10.33624	−0.706	0.082	0.368	0.163

Table 5.
Descriptive statistics
regarding summated
OSE scores

taking appropriate training to augment their technical knowledge to teach the students in a non-face-to-face scenario.

The present study uses a mixed-method study incorporating qualitative and empirical analysis. The technical teaching aids are shaping the education system in a big way with the various online platforms like Google Classroom, WebEx application and Zoom Application coming into the picture. The study reports that the teachers are increasingly adopting best practices for teaching through the online method. We also find out that despite all the difficulties, most teachers are collecting evidence. Commonly used methods are using screenshots, taking graded assignments on Google Classroom and messenger services like Whatsapp.
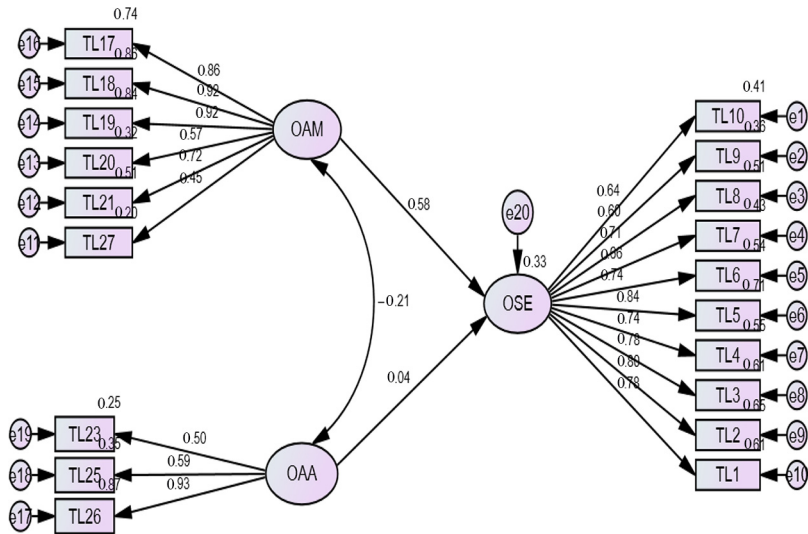
Figure 6.
Path analysis

			Estimate	SE	CR	P	SRW
OSE	←	OAM	0.731	0.071	10.320	***	0.583
OSE	←	OAA	0.029	0.018	1.621	0.105	0.052
TL10	←	OSE	1.000				0.675
TL9	←	OSE	0.885	0.055	16.126	***	0.593
TL8	←	OSE	0.904	0.047	19.155	***	0.683
TL7	←	OSE	1.162	0.060	19.307	***	0.705
TL6	←	OSE	0.931	0.049	19.146	***	0.724
TL5	←	OSE	1.113	0.056	20.032	***	0.855
TL4	←	OSE	1.123	0.058	19.494	***	0.743
TL3	←	OSE	1.043	0.055	18.892	***	0.797
TL2	←	OSE	1.067	0.053	19.976	***	0.774
TL1	←	OSE	1.052	0.053	19.687	***	0.753
TL27	←	OAM	1.000				0.431
TL21	←	OAM	1.280	0.102	12.584	***	0.716
TL20	←	OAM	1.441	0.105	13.729	***	0.585
TL19	←	OAM	1.881	0.139	13.558	***	0.913
TL18	←	OAM	1.788	0.131	13.615	***	0.931
TL17	←	OAM	1.622	0.122	13.337	***	0.858
TL26	←	OAA	1.000				0.935
TL25	←	OAA	0.664	0.059	11.315	***	0.593
TL23	←	OAA	0.512	0.049	10.512	***	0.496

Table 6.
Path analysis
estimates

The overall experience of teachers regarding the online mode of teaching-learning is moderately positive. The study also confirms that a significant segment of teachers displayed a "very negative" experience, probably because of inexperience in dealing with new technology and the glaring difficulties students experience because of resource constraints. The institutions would do well to identify teachers who disapprove of online

Items/responses	Strongly disagree 1 (%)	Disagree 2 (%)	Somewhat disagree 3 (%)	Neither disagree nor agree 4 (%)	Somewhat agree 5 (%)	Agree 6 (%)	Strongly agree 7 (%)
TL1 The students carefully listen to me during online sessions	0.9	2.2	9.0	17.0	27.2	26.0	17.7
TL2 Students attend my online classes willingly	1.0	1.6	6.1	14.2	23.0	29.9	24.2
TL3 The students follow my rules during an online session	0.9	1.0	4.3	10.7	21.8	31.9	29.4
TL4 Students submit their online task on time	1.7	3.8	8.8	14.2	21.6	31.4	18.6
TL5 The students carefully listen to me during online sessions	0.4	1.2	5.3	15.4	22.2	32.3	23.0
TL6 I interact with the students in online mode	0.4	1.3	3.7	8.3	18.3	29.4	38.4
TL7 The students can work in groups in online mode	2.7	7.2	12.4	19.3	21.2	22.0	15.1
TL8 I can clear the doubts of my students during online sessions	0.6	2.0	3.7	9.4	16.3	33.3	34.7
TL9 My students do not create disturbance during my online sessions	1.2	2.9	6.0	11.2	17.3	29.1	32.2
TL10 I can assess my students through online tests	1.6	3.1	5.2	10.3	20.9	29.4	29.4
TL17 It is pleasant to carry out teaching online	1.4	3.0	5.7	12.7	20.9	25.3	31.0
TL18 I find teaching online interesting	1.9	2.9	3.6	13.1	17.6	24.1	36.9
TL19 I like teaching my students online	3.4	3.2	5.1	13.1	18.8	25.3	31.0
TL20 I find teaching online easier than taking a traditional lecture	12.1	12.7	10.7	21.4	16.3	13.3	13.4
TL21 I get to learn new ways of teaching, so I like teaching online	1.2	1.3	4.9	11.3	17.2	25.9	38.1
TL27 Online mode of teaching is on par with traditional teaching	12.9	11.7	10.9	24.3	19.2	12.8	8.2
TL23 It is very difficult for me to take online lectures	36.7	21.6	11.2	10.2	10.2	6.4	3.7
TL25 Earlier I used to know why I was teaching, but I don't see the reason anymore	24.3	14.6	8.0	20.2	14.6	10.8	7.6
TL26 Sometimes I don't see the purpose of teaching online	31.0	17.6	11.2	16.8	11.3	6.7	5.4

Table 7.
Final scale with responses

instruction mode, UNESCO, assess their reasons and offer solutions. In total, 35.5% of the teachers surveyed disagreed that they find online teaching easier than the traditional model. Also, 20.3% of the teachers found it very difficult to maneuver online teaching.

Relationship between teachers' motivation and student engagement in an online learning environment

The study establishes a direct relationship between the teachers' motivation and OSE during the current pandemic. Various factors impact the student engagement levels (Shah and Cheng, 2019), one such factor being an engaging and supportive online teacher (Farrell and Brunton, 2020). We underpin through this study that a highly motivated online instructor would engage and support students in an online instructional environment. A highly motivated online teacher would find teaching online interesting, would experiment with new pedagogies that would be aligned with online instructions and would find a purpose in offering online instructions. We believe that the instructor's role in the online teaching mode is to communicate with the students actively. We strongly recommend that a highly motivated teacher create a sense of connection between the student and the course (Veletsianos and Navarrete, 2012) even in an ERT period.

COVID-19 is unmasking a new face of the Indian HE system (Lall and Singh, 2020); teachers from major universities have reported a highly successful adoption and implementation of online interfaces, albeit also point out the stakeholders' difficulties in ensuring continuous interrupted learning. The results say that the teachers perceive a high OSE among the students, nullifying the resource constraints considerably. The teachers believe that this astronomical rise in using the online interface carries enormous opportunities to think beyond the traditional teaching-learning process and usher new, dynamic and technology-driven learning.

Hence, the present study fills the research gap of studying the impact of teachers' motivation on student engagement. The research vividly conjoins qualitative and empirical analysis. It elaborates on the teaching environment during the COVID-19 pandemic considering best practices used by teachers to teach, their online teaching experiences, methods of recording evidence, their motivation and subsequent assessment of the students' engagement in the online mode of teaching.

Implications

Theoretical implications

This study has conceptualized, developed and validated the OSE scale and OAM scale. The researchers can use this validated scale to measure students' behavioral engagement in the technology-driven teaching-learning environment. The present study establishes the linkage between teachers' motivation and amotivation on student engagement in an online mode. This is probably the first study to emphasize motivated teachers' role in an online environment and the subsequent impact on student engagement. Such scale can help academics work full-time in an online mode in similar scenarios like the COVID-19 pandemic in the future. Further, it can aid future researches in a similar domain.

Practical implications

As the study suggests, teachers' motivation has a direct and significant impact on students' engagement. Teachers' motivation receives little attention in HE in India. A direct implication of such a finding is that there is a need to enhance teachers' motivation in

troublesome and tense times. We recommend that the authorities provide the teachers with a comfortable teaching environment with all the technical support. The universities should conceptualize an appropriate curriculum suitable for online instruction mode. Understanding and support on behalf of the institutes' administration can help in enriching the ERT process. Further, holding timely meetings for teachers to extrapolate the teachers' difficulties can decrease negative emotions and sentiments among teachers.

Limitations and future scope of research

One of the essential stakeholders in the education sector is the students. A study considering the students' perspective can be a part of future endeavors. Future research could replicate this research for nationwide studies on analyzing education in a non-face-to-face environment. The researchers should comparatively explore the teaching processes and pedagogies, resource constraints and institutional readiness to adopt new teaching-learning environments.

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392

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