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Online teaching effectiveness in higher education: Faculty perspectives in India

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Online teaching effectiveness in higher education: Faculty perspectives in India

Abstract

The COVID-19 pandemic demanded the closure of education institutions abruptly in the middle of the academic term, disrupting regular teaching and learning activities throughout the world. The teaching fraternity immediately moved to online teaching to minimize learning damage and continue academic activities. With the sudden shift from traditional practices to online teaching, the key question arises about effectiveness of online teaching in higher education and how the teaching fraternity pursues academic activities, grouped under pre, during and post online teaching. This study aimed at examining the faculty perspective of online teaching in higher education without much experience and preparation. Data was collected from 81 faculty members across the disciplines of Engineering, Technology and Science for technical courses and Management and Commerce for the School of Social Science. Opinion of respondents received in pre, during and post online teaching activities and effectiveness in comparison to traditional system were analyzed.While the results show that there is no substantial pedagogical change or difficulty in delivery through online teaching. However, concerns remain about classroom management and the evaluation process through online as compared to face to face teaching. There is no significant difference of opinion from the faculties of School of Engineering and School of Management in regard to pre and post, except during the online teaching activities.

Practitioner Notes

N/A

Keywords

Online Teaching, Higher Education, COVID-19, coronavirus, emergency remote teaching

Introduction

India has made substantial growth in strengthening its education system in both, conventional and distance/online learning modes, since the inception of the Distance education system in higher education in India way back in 1962. However, in the present COVID-19 scenario, education institutions, all over, have been caught up in an unprecedented situation of conducting the teaching and learning process predominantly through online mode (Hodges et al., 2020). Higher Education Institutions (HEIs) in India have positively responded to this change, as it ensures to have minimal impact on the teaching-learning process (Stickney et al., 2019).

The present situation is neither pre-planned nor well prepared and is regarded as the only natural solution to the given situation. Key questions arise about the ways to maintain quality of education and possible ways of students changing their learning behavior, and best ways of faculty changing their style of teaching and learning from hand-holding to screen-holding (Zhao, 2003). The demands of teaching-learning processes across the different fields of higher education like Medical, Management, Engineering, Law, and Design are different and perhaps online teaching may not justify the output of conventional teaching (McCutcheon et al., 2015).

The present study focuses on imparting Engineering and Management education through online teaching. It also examines the perspective of Engineering and Management faculty members on the effectiveness of online teaching. Irrespective of the subject, the basic requirements of faculty include materials in hand and good connectivity of internet from both faculty's and students' end for uninterrupted class – and the speed of internet, as it is still uneven in every part of the country (Perry & Pilati, 2011). Secondly, though practical classes could be run through virtual lab views, the streams involving practical laboratory classes face a big challenge in online teaching. However, online teaching has limited values and cannot replace the on-hand experience by students. Similarly, in management education, the effectiveness of online teaching mode for case studies, group project work, role plays, simulation exercises, and so forth delivered online, is still doubtful – especially summer internship and Industrial visits – which becomes an integral part of management education (Rasheed et al., 2020; Tiwari et al., 2021; Xie et al., 2021; Sundararaj & Rejeesh, 2021).

Whether it is online or offline, teaching requires a certain level of preparation for faculties in three stages, namely pre, during, and post-teaching sessions (Perry & Pilati, 2011). Therefore, the present study focuses on comparing the perceived

ease and effectiveness of online sessions against the conventional system. Pre-session activities include sharing course outlines and session plans, reading and teaching notes, creation of class id and passwords for online teaching, and technically well-versed in hardware and software-related issues while delivering through online mode. Similarly, while the class is being conducted, faculty members should adhere to the content designed and teaching pedagogies to deliver. They should also ensure to enroll students in the online class and track their attendance, maintain discipline in the class, handle queries of students without neglecting fellow students, and maintain direct control over the class (Brinkley-Etzkorn, 2020). This is perhaps considered more challenging in an online environment. In the third phase, i.e. post teaching session, a professor allots additional teaching hours for slow learners as well as to clear the doubts. In addition, they perform assessments and evaluations of students. The present study aims to gauge the faculty perspectives on these three parameters of pre-during-post activities of online vs. face-to-face teaching.

For the last two months from now, right from the closure of the campuses due to the lockdown and social distancing norms, most of the universities have immediately gone ahead with the online teaching process. The effectiveness of the process in terms of student satisfaction on learning outcomes, however, is a matter of concern. Academics need to honestly solicit, assess and evaluate faculty as well as student feedback quickly to take corrective measures at the earliest. Since online teaching is going to be a new normal from now onwards, such an exercise is only timely. In the first stage, gauging the faculty perception on the effectiveness and challenges they are facing in delivering their courses – both technical and non-technical – in terms of preparedness, institutional support system, teaching effectiveness, class environment, and evaluation component system, will be studied and subsequently the same will be carried out from the students' perspective also. The objective of this study is to assess and compare online with conventional teaching processes and compare the same in pre, during, and post-teaching session activities of faculty members.

Review of literature

In the virtual classroom, the level of teaching and learning might or might not be the same as in a traditional classroom (Zhao, 2003). Given the mandatory online teaching-learning process of higher education, this pertinent statement is being repeatedly raised by many stakeholders of the higher education system.

The program assessment contrasted student performance and self-report data in two types of learning environments – a conventional classroom environment and an online learning environment (Perry & Pilati, 2011) – to evaluate the

comparative efficacy of online delivery, to classify characteristics of successful and ineffective distance learning students, and to gauge the degree of satisfaction with online delivery. Well-planned online learning opportunities vary greatly from courses that are delivered online in response to a crisis or disaster. During the COVID-19 pandemic, colleges and universities working to preserve instruction would consider those discrepancies when considering this remote emergency teaching (Hodges et al., 2020). The learning ability of high-skill students was found to be higher than low-skill students in the online learning and teaching mode. The low-skill students, who do not do well, need more handholding (Wallace & Clariana, 2020). Even the teachers, who used such online teaching assignments (Alzahrani & Althaqafi, 2020) while studying their perception of the effectiveness of such online programs and use of knowledge and skills, did not find a positive perception about imparting online classes.

Online education requires a classification of phases of learning/teaching performed in cyberspace. These are extraordinary circumstances and they generate tension, anxiety, and a relentless quest for new acquisition of information (Araújo et al., 2020). With the sudden imposition of online teaching on the faculties of higher education, without much experience and having limited training, they are not satisfied with the effectiveness of online teaching and learning. While analysing the same, a recent study (Brinkley-Etzkorn, 2020) concluded that after the course was taught online, the participants were less optimistic and less satisfied with their training experience than they were immediate, before or after the training. Multiple instructors cited the need for additional or ongoing training and resources (Horvitz et al., 2015). From the faculty's perspectives, they seem to experience problems like teaching content with the use of technologies, as most of them are unaware of the newly developed technologies. The key issues faced by the educational institutions include difficulties in delivering adequate instructional technology; and a lack of effective training programs for teachers (Rasheed et al., 2020).

The main element of successful online teaching is high-speed internet connectivity at the instructor's and learner's locations, which is lacking by many in the present scenario. A significant obstacle identified in the process of online learning is the online learning infrastructure.(Aljaraideh & Al Bataineh, 2019). To enhance the online learning process, a past study suggested that additional measures should be taken into account by decision-makers. (Brinkley-Etzkorn, 2018). While measuring the influence of faculty development training on teaching effectiveness, it was claimed that the teachers demonstrated modest improvement in their online teaching effectiveness. Gorsky and Blau (2009) found contradictory results, with being very satisfied with one instructor about online teaching and a negative result with another instructor of the same subject. Even

the time taken by the instructor for preparing is much more in online delivery as compared to an offline delivery system (Hislop & Ellis, 2004). Another study conducted to analyse the instructor's online teaching satisfaction, Wasilik and Bolliger (2009) found that there is a relatively positive degree of satisfaction in online teaching. Major problems associated with technical challenges include lack of face-to-face interaction, lack of student participation, and lack of elements related to accessibility, access and student diversity.

Martin et al. (2019) highlighted that online instructors were found to use a hierarchical design process, backward design, and built learner experiences during the design process. The faculty suggested the use of several tests, the use of conventional and accurate evaluations, the use of rubrics to evaluate students, course models, and quality control process, and peer feedback for evaluation and assessment. Stickney et al. (2019) study report that faculty of higher education who teach online are generally happy, and that satisfaction is more likely when there is sufficient preparation and flexibility in their teaching schedules. Similar findings were also reported by (Fish & Gill, 2009) who maintained that faculties having previous experience are satisfied with their online delivery of courses, in contrast to those faculties who have little or no previous experience of online teaching. Even the student's response towards online teaching is not much promising, as they feel they have learned less in online courses when compared to their experience in the conventional system (Bergstrand & Savage, 2013). To make online teaching more meaningful and appealing for faculties as well as students, proper institutional policy, faculty orientation, and faculty development through training are the need of the hour (Shea et al., 2005). The three factors that influence the effectiveness of online teaching are identified as the instructor, student, and institutional related (Bolliger & Wasilik, 2009).

Online teaching is more about working in synchrony with students' satisfaction, quality of teaching, and success in their professional careers (Frazer et al., 2017). Students always preferred the conventional system of teaching over the online method of teaching (Ganyaupfu, 2013). While coming to learning assessment of students over online teaching (Ni, 2013), performance grade is found to be independent of the mode of instructions. Through administration methods, online evaluation has a certain impact which is considered to be insignificant (Risquez et al., 2015). There is also an opposite finding by Stowell et al. (2012), who concluded, in their study, that online evaluation had a significantly lower response rate than classroom evaluation. The key concerns expressed by instructors of online teaching include student success in online classes, student feedback regarding faculty, technical support, and workload management (Wingo et al., 2017). Faculties found online teaching, in areas of education that require practical and laboratory-based class delivery, are least effective and students are not

comfortable enough with virtual laboratory systems (Berk, 2013). However, the available evidence suggests that online teaching is no less effective than conventional teaching (McCutcheon et al., 2015; Tuna et al., 2009.

The review of existing literature provides a mixed view of faculty satisfaction and effectiveness of online teaching and most of these previous studies were conducted in an environment, where both online and offline classes are in existence and most of the faculties used blended teaching and learning method. However, the present situation is unprecedented and almost all the educational institutions shut down their campuses in the last two to three months, due to norms of social distancing and dangers of being affected by the COVID-19 pandemic. Majority of the education institutions engaged their faculty to complete the syllabus and conduct continuous evaluation through online mode, where it is not a matter of choice but compulsion. In light of this, the present study attempt to study the effectiveness of online teaching that has been adopted by the faculties of higher education in these compulsive situations. If the present situation persists in the future too, the findings of the study may help the faculty to shape their teaching pedagogy and class management in a better way. The various tasks undertaken by the faculties for the online delivery are divided into three stages – first Pre-online teaching preparedness, second During-online teaching, and finally Post-online teaching – to see the satisfaction and effectiveness of virtual delivery as compared to the conventional delivery in the classroom. Thus, the objectives of this study are:

- To evaluate the effectiveness of pre, during, and post online teaching activities in comparison to traditional practice.
- To compare the opinion from the faculties of Management and Engineering branches on online teaching.

Method

An empirical study was carried out by surveying the faculty members of higher education who have started online teaching in a compulsive environment due to extended lockdowns, social distancing norms, and closure of campus in mid of the ending semester or trimester program without much idea and preparedness. They were approached from the disciplines of management, commerce, engineering, and technology on a convenient basis and personal contacts. Convenience sampling was used in the selection of respondents based on availability and willingness to participate. The respondents were asked to fill the questionnaire through Google form.

In total 100 faculty members were approached, out of which 81 responded successfully. The questionnaire was prepared to understand the perception of the respondents on the effectiveness of pre-, during-, and post-activities of online teaching. The questionnaire consists of 31 questions on these three parameters. The questionnaire was prepared, pilot tested, and validated by the five experts, from the level of Institute Directors and University Vice-Chancellors, who had prior experience in online teaching. Validation of the questionnaire was conducted to check the internal consistency of the responses collected through a five-point Likert scale where "1" represents "highly disagreed" to "5" as "highly agreed". The Cronbach's Alpha was 0.952, which shows greater internal consistency and reliability of the instrument for data collection.

The data collected was further analysed to understand the faculty's perception of the effectiveness of online teaching. The data also verified for the difference of opinion on the online teaching from the faculty members of the technology and engineering i.e. technical education and the other group from management as well as commerce stream, whether they have the same or different opinion through One-Way Analysis of Variance.

Table 1.
Respondents demographic information

Items	Description	Number	Percentage
Age	Less than 30	22	27.16%
	30-50	44	54.32%
	More than 50	15	18.51%
Gender	Male	29	35.80%
	Female	52	64.19%
Discipline	Technical (Engineering and Technology)	42	51.85%
	Non-Technical (Management and Commerce)	39	48.14%
Institution	Private	62	76.54%
	Government	19	23.45%

Sample

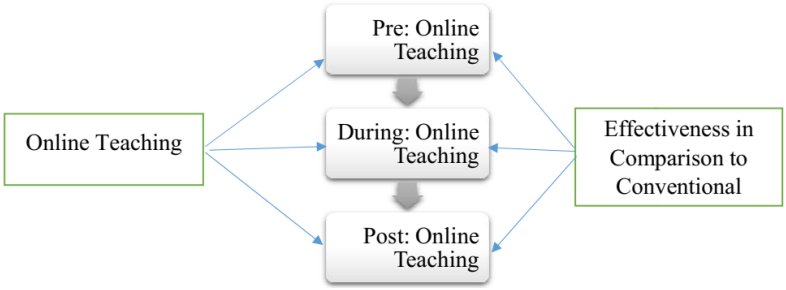
Respondent's demographic information was collected to give a fair presentation of age, experience, gender, area of teaching, and type of institutions they work in. Majority of the respondents belong to the age group of 30 to 50 years i.e. 54.32 percent, while 27.16 percent are of less than 30 years and around 19 percent are senior professors – this represents faculty from the new joiners to senior-most professors. Similarly, around 65 percent of respondents are female and 35 percent belong to the male category. Data were collected from faculties, who had

technical backgrounds teaching in the various departments of engineering and technology; and other groups such as social science, humanities, and particularly faculty from management and commerce. These two most popular and diverse group of faculties was selected to see if there is any perceptional difference between them. Faculties from the technical branch consist of 52 percent and management branch of 48 percent. Likewise, faculties from private universities and institutions consist of 77 percent of the total respondents and 23 percent from government-recognized universities and institutions, as most of the Government aided institutions do not take up online classes as seriously and religiously as taken by the faculties from the private institutions. The demographic information provides some well-balanced respondents on the various parameters (see Table 1).

Analysis

In the line with the objective of the study, respondents' views on online class delivery were sought on three parameters and its effectiveness as compared to the conventional system is pre-, during-, and post-teaching practices (see Figure 1).

Figure 1.
Overall Architecture



Therefore, the following sub-research questions on the perception of faculty members on the effectiveness of online teaching on these three parameters was sought in the line with the main objective of the study.

1. What are the faculty's perceptions about online teaching before they start to deliver their classes and ease in completing pre-session activities?
2. How conveniently are they able to deliver their online sessions and perform class management in comparison to conventional practices?
3. Are they satisfied with the student's evaluation, doubt clearance, and other follow up of the students conducted in post online teaching activities?

Pre-activities

Online teaching activities of a professor includes preparation and sharing course outlines, session plan, learning outcomes, teaching notes, reading materials and making himself well equipped with pedagogical instruments supposed to be used during the class and also making himself technically well acquainted with various ways of using online platforms and technical equipment like a laptop, digital board and camera being ready for use. Apart from this most perceptional questions regarding the use and effectiveness of online teaching are also put across under this category. Though the response was collected in five-point Likert scale from highly disagreed to highly agree, the same were categorized into three categories here like agree (Strongly Agree, Agree) one group, neutral response the second group and disagree (strongly disagree, disagree) the third group (see Table 2).

Table 2.
Faculty perceptions of the effectiveness of pre-teaching online

Items	**Agree**	**Neutral**	**Disagree**
1. Easy to share course outlines and session plans well in advance before the class begins.	0.75	0.11	0.14
2. Preparing and sharing readings and teaching notes are relatively easy in online teaching.	0.67	0.19	0.15
3. Teaching online is similar to teaching face-to-face classes.	0.17	0.33	0.49
4. You are well skilled and experienced to handle online teaching classes before.	0.42	0.28	0.30
5. You are well equipped with knowledge in hardware required for taking online classes.	0.35	0.20	0.46
6. The level of effort required in preparing for online classes is the same as that of a face-to-face class.	0.16	0.25	0.59
7. Were you well acquainted with online teaching platforms before covid-19, which forced us to go for online teaching?	0.35	0.25	0.41
8. Online teaching is more acceptable than face-to-face classes.	0.15	0.27	0.58
9. The level of skills & competencies required for online and face-to-face teaching is the same.	0.12	0.27	0.61
10. Online teaching is more flexible in delivering the content than a face-to-face class.	0.42	0.25	0.33
11. Online teaching offers more opportunities to	0.33	0.26	0.41

make the class interesting.			

During-activities

Online teaching is the key component of online education, where the faculty members deliver their content to the students through virtual presence. It requires meticulous preparation on the part of the faculty, to start the class well on time, allowing them to enter the classroom, taking stock of their attendance, completing the planned syllabi of the session, selecting of right pedagogy to get the attention of all the students and controlling and managing to get the attention of each student. The response received from the respondents were analyzed in percentage terms with activities carried out during online teaching as shown in table 3 below.

While 62 percent of faculty members agreed that they can deliver the session plan in the stipulated time, only 50 percent believe that it is easy to manage and control students in the online class and 55 percent felt that students' participation in class discussion is satisfactory. However, because of connectivity issues, network problem is a big hindrance in the smooth conduct of classes with 73 percent often feeling distracted during the class because of such issues. Similarly, 60 percent of respondents felt the absence of body language while sensing the satisfaction and understanding level of students. 60 percent of faculty disagreed that they are unable to keep track of students during the class and 68 percent are of the view that they have better control of them during the class as compared to the conventional teaching system.

Table 3.
Faculty perceptions of the effectiveness of during-teaching online

Items	**Agree**	**Neutral**	**Disagree**
1. You can deliver the session as per your session plan.	0.62	0.17	0.21
2. Students log in for the class well in time.	0.35	0.19	0.47
3. Students attendance is better than offline classes.	0.26	0.16	0.58
4. It is easy to manage and control students in online classes.	0.49	0.21	0.30
5. You can keep track of student engagement in your online session.	0.27	0.14	0.59
6. You feel better being in control of getting your students' attention	0.22	0.98	0.68
7. You often feel distracted because of connectivity issues raised by students during the class.	0.73	0.62	0.21
8. There are no substantial changes in teaching pedagogy in online teaching other than a face-to-face class.	0.20	0.19	0.62
9. Students participation in class discussion are satisfactory	0.56	0.22	0.22

10. Effectiveness of Assignment, Presentation, Case Study, and Group Discussions are high in Online Teaching.	0.40	0.12	0.48
11. You, feel the absence of body language while sensing the satisfaction and understanding level of the students.	0.61	0.16	0.23
12. You believe that students are achieving the learning outcomes of your courses.	0.38	0.17	0.44

Post-activities

Online teaching activities of a professor include attending to the students who need a one-to-one discussion in clearing their doubts and making up for the students who are absent from the formal online class. The second important task post online teaching activities include receiving the assignments and classwork back and making their evaluation, making class test, quizzes, and continuous evaluation of the students. In the line of these activities, the response received from the survey analyzed in percentage terms about their level of agreement about the effectiveness of post online teaching activities, presented in Table 4 as below.

While the response of the students in reaching out to the professor for clearing their doubts, post sessions, is not very high and 60 percent are of the view that they hardly approach for an additional class, 50 percent of faculty members agreed that if a student approaches for an additional session, they generally schedule additional sessions for the slow learners. The overall sentiments in terms of evaluation of students through the online system are very negative. 74 percent are apprehensive of cheating in the online evaluation and 78 percent view that the evaluation of students through online mode is very difficult. 70 percent of respondents are not confident of honest assessment and evaluation in online mode as compared to the traditional system.

Table 4.

Faculty perceptions of the effectiveness of post-teaching online

Items	**Agree**	**Neutral**	**Disagree**
1. You are apprehensive of cheating in online teaching.	0.74	0.12	0.14
2. Students reach out to you after the formal sessions for doubt clearance as you experience conventional teaching.	0.28	0.12	0.59
3. You provide separate slots for the slow learners to speed up after your formal sessions.	0.51	0.31	0.19
4. Absentees can make up for the missing contents/sessions with the help of recorded videos.	0.22	0.21	0.57
5. Evaluation of students in your course is easier in online	0.12	0.98	0.78

teaching.			
6. You are confident of conducting assessment and evaluation as honestly as in a conventional system.	0.17	0.14	0.69
7. You can make a complete assessment of students in all evaluation components through online mode.	0.15	0.31	0.54
8. Students' performance in evaluation is better than the face-to-face process.	0.99	0.33	0.57

Divergence on perceptions of online teaching teaching by disciplines of engineering and management

The responses were collected from the faculties from the Department of Engineering and Technology and the Department of Management and Commerce from the various Universities and Institutions. The two schools of higher education generally have different teaching pedagogies; the use of lab and practical classes and teaching mechanism and one may believe that perhaps the opinion of the faculties from these two schools will differ on account of the effectiveness of online education. ANOVA test was conducted to compare the mean of the opinions received on pre, during, and post online teaching as discussed above. The hypothesis constructed and test of ANOVA was applied through statistical software SPSS to get the result as presented below.

> ***H_0:*** There is no significant difference of opinion on the effectiveness of pre, during, and post online teaching activities by the faculties from Engineering and Technology and Management and Commerce departments (see Table 5).

With F values of 2.179, 4.279, and 0.724 for pre, during, and post online teaching with *p*-value is more than 0.05 in case of pre and post online teaching however it is 0.008 in case of during the online teaching. So, the null hypothesis is accepted for pre and post online teaching and that there is no significant difference between the opinions about the effectiveness of online teaching by the faculties from the school of Engineering and the School of Management and Commerce. However, the null hypothesis is rejected in the case of the effectiveness of the online teaching and the alternate hypothesis is accepted that there is a significant difference in the opinion of faculty members on the effectiveness of activities during online teaching. The reasons perhaps the faculties of the school of Engineering and Science needs practical display and application of the instrument, equipment and lab facility for delivery of course content which many not that effective through the virtual lab to run the practical classes.

Table 5.
Hypothesis testing with analysis of variance

		Sum of Squares	df	Mean Square	F	Sig.
Pre	Between Groups	0.56	1	0.57	2.179	0.144
	Within Groups	20.64	79	0.26		
	Total	21.21	80			
During	Between Groups	0.98	1	0.98	4.279	0.008*
	Within Groups	32.30	79	0.78		
	Total	22.65	80			
Post	Between Groups	0.17	1	0.17	0.724	0.398
	Within Groups	18.24	79	0.23		
	Total	18.41	80			

Discussion

Right from the closure of the educational institutions, due to the lockdown and social distancing norms, most of them have opted for the online teaching process. As the effectiveness of the process in terms of student satisfaction on learning outcomes is a matter of concern. Thus, the present study attempts to study the effectiveness of online teaching that has been adopted by the faculties of higher education, especially during the pandemic. As online teaching is going to be a new normal from now onwards, academics need to honestly solicit, assess and evaluate faculty as well as student feedback quickly to take corrective measures at the earliest concerning the effectiveness of online teaching and learning. This study assesses and compares online with conventional teaching process and compares the same in pre-, during-, and post-teaching session activities of faculty members.

From the study, it is understood that in the pre-teaching online activity phase, the faculties teaching activities include preparation and sharing course outlines, session plan, learning outcomes, teaching notes, reading materials, and making himself well equipped with pedagogical instruments, which are supposed to be used during the class and also making himself technically well acquainted with various ways of utilizing online platforms as well as technical equipment like a laptop, digital board, and camera, that are similar to the findings of the previous studies (Horvitz et al., 2015). From Table 2 it can be inferred that the majority of the respondents agreed that it is easy to share course outlines and session plans well in advance before the class begins, relatively easy to prepare and share readings and teaching notes in online teaching, and one must be well skilled and experienced to handle online teaching class. On the other hand, the majority of

them stated that online teaching is not the same as conventional teaching. Majority of them disagreed that online teaching is more acceptable than face-to-face classes and the level of effort required in preparing for the online class is the same as that of a face-to-face class. At the same time, most of them consider that online teaching is more flexible in delivering the content than face-to-face class, as suggested in one of the recent studies (Brinkley-Etzkorn, 2020).

Likewise, it is understood that in the during-teaching online activity phase, online teaching is regarded as the key component of online education. In this phase, faculty members deliver their content to the students in a virtual environment that stay similar to the findings of the previous researches (Brinkley-Etzkorn, 2018, 2020). From the analysis, it can be inferred that faculty members require meticulous preparation to start the class well on time, allow students to enter the classroom, track their attendance, complete the planned syllabi of the session, select the right pedagogy to get the attention of all the students and manage to get the attention of each student. Majority of the faculty members agreed that they were able to deliver the session plan in the stipulated time. While half of the respondents believed that it is easy to manage and control students in the online class, on the other hand, the majority of them found that student's participation in class discussion is satisfactory. Above all these, majority of the respondents found the classes to be distracting due to internet connectivity issues, felt the absence of body language regarding satisfaction and understanding level of students, difficult to keep track of students during the class and have better control of students during the class as compared to conventional teaching system.

Subsequently, it is understood that in the post-teaching online activity phase, online teaching activities of a professor include attending to the students who need a one-to-one discussion in clearing their doubts and making up for the students who are absent from the formal online class. The second important task post online teaching activities includes receiving the assignments and classwork back and making their evaluation, making class test, quizzes, and continuous evaluation of the students, which stand similar to the findings of the past researches (Wingo et al., 2017). While the response of the students in reaching out to the professor for clearing their doubts, post sessions, is not very high and most of them hardly approach for an additional class. Half of the respondents agreed that if a student approaches for additional sessions, they generally schedule additional sessions for the slow learners. The overall sentiments in terms of evaluation of students through the online system are very negative. Majority of the respondents are apprehensive of cheating in the online evaluation and that the evaluation of students through online mode is very difficult. Likewise, most of the respondents are not confident of honest assessment and evaluation in online mode as compared to the traditional system (Gorsky & Blau, 2009).

To understand the difference of opinion on the effectiveness of online teaching by faculties of Engineering and Management area, responses were collected from the faculties from the Department of Engineering and Technology and Department of Management and Commerce from the various Universities and Institutions. From the study, it was found that there is no significant difference of opinion on the effectiveness of pre, during, and post online teaching activities by the faculties from Engineering and Technology and Management and Commerce departments.

Conclusion

The study examined the perception of faculties of higher education about the effectiveness of online teaching, which was somehow imposed due to prevailing situation arising out of the wide-scale spread of COVID-19 and social distancing norms, though Blended teaching and learning were in practice in many of the programs and courses by the higher education institutes and university. Perhaps, this is the first time where everyone turned to delivery of course content through online mode, without much time for preparation and proper training and experience. Though large, the result shows faculty were able to deliver the content to the greater satisfaction, many of them felt the teaching-learning process in the conventional system has greater advantages compared to online teaching and the same may not be a long term solution and that they need to come back to the classroom sooner if it is possible. The issues largely remain the matter of concern for them regarding connectivity issues, uninterrupted network, how to obtain and hold the attention of the students during delivery, classroom management, and control, and particularly carrying out the evaluation components through online mode. However, the situation added a greater experience and definitely, the faculty members will be able to plan well in terms of delivery if the online teaching or even the blended teaching-learning process will continue for the upcoming academic year too. The opinion of faculty members from the areas of Engineering, Technology, and Science, as compared to that of from the areas of Management and Commerce, is not significantly different and both have a similar opinion about the effectiveness of pre, during, and post online teaching activities.

Implications, future research, and limitations

This study addresses issues related to teachers' use of different online teaching approaches, teachers' challenges in carrying out online teaching, and ways institutions planned, managed, designed, and evaluated courses for online pedagogy aiming at professional development provisions to their faculty. This study helps the higher education institutions who have opted for online pedagogy during COVID-19 and post-COVID-19, to better prepare teachers as well as students to cope with the new normal. All the educational institutions can apply

the results of this study to enhance the process of teaching and learning in an online mode.

The study has certain limitations too and provides scope for further research. Firstly, in the present study the respondents are approached particularly from the Institute of Engineering and Technology and Management only, however, the area of higher education is very broad, and pedagogical differences in different streams may give different results to the outcome of the study. Secondly, students are the important stakeholders and a study could be carried out on the opinion of the students about the success of online teaching in terms of their learning and skill addition and achievement of learning outcomes, the response from the students could also be compared to that of the faculty to see the opinion difference between these two important stakeholders of any education system. In addition, this paper discusses on local evaluation of online learning and teaching practices within a limited population and limited context that makes the results not generalizable to a wider international context. Different factors that can influence the effectiveness of online pedagogy are not discussed, which could have helped in addressing international readers. Thus, future researchers can focus on this aspect.

Conflict of interest

The authors report no conflict of interest.

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