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Online teaching style: insights of faculty and students' perspectives and student engagement

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ABSTRACT

Medical education had a paradigm shift to online learning during COVID 19 pandemic. The studies conducted identify the benefits and limitations of online learning but not much studies on the faculty and students' perceptions of faculty online teaching style and the degree of online student engagement. The study was done at Kakatiya Medical College, India. At the end of one year of online teaching to the novice foundation year students during lockdown period, the faculty and students' perceptions on faculty's online teaching styles and degree of student engagement were recorded using teaching style inventory (TSI) and online student engagement questionnaire. The study found that 60% of the faculty and 42% of the students perceived that the faculty adopted collaborative teaching style, thus the perception difference was significant (p=0.05). The perception of other teaching styles such as suggestive, assertive, and facilitative among faculty and students were different but statistically not significant. Students positively engaged when faculty practiced facilitative and collaborative teaching styles. To conclude, facilitative, and collaborative, teaching methods help medical students' motivation for online engagement. Medical students were better engaged with online instruction when instructors gave prompt responses to questions, insightful criticism of work, and individualized coaching.

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1. INTRODUCTION

The COVID-19 pandemic jeopardized medical education. Some countries continued transforming learning from classroom to home environment, whereas some countries gave a gap in graduating the students hoping to start face to-face sessions. Medical education had a paradigm shift to online learning; number of studies conducted to identify the benefits and limitations of online learning showed that there was a mixed result from both the students and the faculty. The majority preferred face-to-face medical education as a desirable method of teaching learning. However, most of the students opined that blended programs save their time and allow them to plan time efficiently in achieving required competencies [1]. Learning basic sciences in medical graduation is a mix of knowledge scaffolding and experimental learning at labs. Studies showed that blended learning of lab-based studies saves student's time and costs of labs [2]. The following common

teaching techniques have been observed in online learning [3]: i) synchronous instruction: using video conferences, webinars, or live chat sessions, teachers and students can converse in real-time. It encourages quick responses and engages participation; ii) asynchronous instruction: with this approach, instructors provide recorded lectures, online materials, and discussion boards to students so they can take part at their own leisure. It supports flexible learning and accommodates various schedules; iii) collaborative instruction: through online case studies, virtual team projects, and cooperative document updating, this strategy emphasizes student teamwork and collaboration. It promotes collaboration, critical thinking, and communication. Learning online demands internet, learning material access, virtual communications with co-learners, and seeking support from the instructor for achieving the desired learning outcome [4]. In online learning, the instructor's role is crucial in the success of online teaching. Facilitating the interactions, providing higher motivation and engaging the students are the important instructor traits for a successful online medical teaching [5].

Researchers interviewed award winning teaching faculty to identify the desirable online instructors teaching styles for a successful online learning, but there is paucity of studies whether the faculty perception of their roles are same as that of the student's perceptions. Surveys, questionnaires, and interviews are frequently used as measuring tools when evaluating teaching methods in online education. These tests aim to evaluate how well students think their teachers are doing their jobs, as well as their level of engagement, contentment, and overall learning results. Similar measures can be used to measure faculty members' opinions in order to comprehend their beliefs, attitudes, and thoughts about their duties as online teachers [6].

Several studies have focused on microbiology education, particularly examining the effectiveness of blended learning approaches that combine online and face-to-face practical sessions. One study investigated student preferences and engagement in a microbiology unit using both quantitative (questionnaire data from 72 first-year students) and qualitative methods, finding that a majority of students favored a combination of face-to-face and online sessions [7]. Another study, conducted in the USA, highlighted strong student support for blended digital and in-person laboratory activities in undergraduate medical education [8]. Finally, a study on nonscience majors' microbiology courses evaluated the effectiveness of an online microbiology course compared to traditional face-to-face courses, finding comparable academic outcomes and positive student evaluations across both formats [9]. These studies collectively underscore the growing interest and positive outcomes associated with integrating online components into microbiology education to enhance learning experiences while addressing budget constraints.

However, there are insufficient studies on students' and faculty's perceptions of online teaching styles and student engagement in online classes. Given the mandatory shift to online teaching during the COVID-19 lockdown period, Basic Sciences Departments at Kakatiya Medical College in South India decided to deliver content online to large groups of novice students using a mix of active and passive teaching methods. The present study hypothesizes that students and faculty perceive interactive online teaching styles in lab-based subjects like microbiology positively and that these methods effectively engage students.

2. METHOD

This is a descriptive cross-sectional survey-based study. Sampling was a convenience sampling by sending the questionnaire to all the first, second year medical undergraduates and basic sciences teaching faculty. The responded participants, 440, was our sample size.

All male and female first and second-year undergraduate medical (MBBS) students and faculty involved in basic sciences teaching in our institute were recruited after obtaining their written informed consent. The total number of participants recruited was 583 of which 508 were students and 75 were faculty. The number of participants responded was 440 (75.47%), of which 392 were students and 48 were faculty. Out of 440 participants who completed the study, 275 (62.5%) were female and 166 (37.5%) were male. The study was conducted in Kakatiya Medical College, Warangal, South India. The study period was from March 2020 to April 2021 (12 months) and data collection was from July 2021 to November 2021 after ethical board approval (IRB of Kakatiya Medical College Approval No. ECR/840/Inst/TG/2016/RR/20/12).

The yearly intake of medical undergraduates is 250 in Kakatiya Medical College, a government medical college having 1,200 bed strength catering medical care to one million patients from surrounding areas in one of the south Indian states. During the lockdown period of COVID-19, online teaching via Zoom was planned for a large group of students in basic sciences, from March 2020 to April 2021. Students attended the online classes via Zoom. Live streaming of teaching was done by discussing the concepts using a power point presentation and lab-based procedures like gram staining, agar plating, and hanging drop experiment were either live telecasted or shown videos that were taken in real-time by the teaching faculty in the university labs. The faculty checked the students' engagement by asking questions randomly calling the students by name during the class and concluding the class with question-and-answer session.

At the end of one year, we proposed to understand how the students perceived the teachings online, whether they match with the perceptions of the faculty and what is the students' online engagement? After taking the college ethical board approval (IRB Approval No. ECR/840/Inst/TG/2016/RR/20/12), we conducted an online survey using Google Forms to understand students' and faculty's perceptions of the faculty teaching style during the online sessions. Students and faculty who were willing to take part in the survey filled out the teaching style inventory (TSI) questionnaire [10]. In addition, the students answered student-engagement (SE) scale questionnaire [11]. The reliability score of the items used in both the scales, namely TSI and SE was good with Cronbach's alpha value of 0.8. The corresponding author conceptualized and collaborated with Kakatiya Medical College, India in conducting the present study.

The results were analyzed using SPSS24. Descriptive statistics were used in frequencies and percentages for students' and faculty's perceptions of faculty teaching styles and students' overall engagement. The Chi-square test was used to study the perception differences between students and faculty on faculty teaching styles. A p-value less than 0.05 was taken as significant.

3. RESULTS AND DISCUSSION

The 508 first and second-year medical undergraduates and 75 basic sciences faculty were invited to participate in the survey, 77% of the students (N=392) and 64% of the faculty (N=48) answered the survey questionnaire completely. Female participants from students were 62% (N=243) and 67% (N=32) from faculty. Whereas less participation was observed from male participants from both the groups, as shown in Table 1. The proportion of the sample size of the two groups was comparable.

Half of the students, 53% (N=207) and 54% (N=213), perceived the faculty's online teaching styles were suggestive and assertive respectively. Whereas 42% (N=164) perceived that the faculty were collaborative and 40% (N=156) perceived them as facilitative. The 71% (N=34) of the faculty perceived that they were suggestive, 60% (N=29) perceived that they were collaborative, and 62% (N=30) of the faculty perception was that they were assertive, but only 54% (N=26) perceived their teaching style as facilitative. When the perception differences are compared between students and faculty, a significant statistical difference was found in the collaborative teaching style. The 60% (N=29) of the faculty's perception of their teaching style was collaborative, but only 42% (N=164) of the students perceived that the faculty were collaborative, the difference in perception was statistically significant (p=0.05).

Though there were some differences in perception of facilitative, suggestive and assertive teaching styles between students and faculty, the difference is not statistically significant. The 54% (N=26) of the faculty perceived that they are facilitative and 40% (N=156) of students agreed that faculty are facilitative (p=0.1). Similarly, 71% (N=34) of faculty and 53% (N=207) percent of students perceived the faculty adopted a suggestive teaching style (p=07) and an assertive teaching style was perceived by 54% (N=213) of the students and 62% (N=30) of the faculty (p=0.06), as shown in Table 2. A total of 365 students answered student engagement scale. Of which 112 (31%) of students were engaged whereas 252 (69%) were disengaged during online classes as presented in Figure 1.

During the COVID-19 pandemic, the medical education had a significant shift towards online learning; number of research studies conducted to identify the benefits and limitations of online learning demonstrated that there was a mixed result from both the students and the faculty. The present study showed 243 female students' (62%) and 32 female faculty (67%) participation was higher as compared to 150 male students (38%) and 16 male faculty (33%). Similarly, other studies demonstrated 22%–34% male participation in online educational research compared to 75% of female participation [12]–[14]. There was no significant difference between the faculty and students on the perception of faculty online teaching styles. The present study is the first to explore the insights of students and faculty on online teaching styles for microbiology courses. However, a study was conducted using a similar scale in clinical sciences during face-to-face problem-based learning sessions [15], and another study was conducted in the UAE on online clinical didactic lectures, using a different scale [12].

Both the groups perceived similar facilitative, suggestive and assertive teaching styles. However, 29 (60%) faculty perceived that they were collaborative, but 228 (58%) of students disagree with the faculty and their perception difference with faculty on collaborative teaching style was statistically significant. These findings were similar to other studies done in India and France [16], [17], they showed that student perceptions were the same as the faculty on the perception of faculty teaching styles. According to another study, students and teachers evaluate instructions using quite different standards. Faculty members have expressed doubts about the reliability of student evaluations of the efficiency of the instruction [18].

Similarly, the study found that there was a statistical difference between students' and faculty perception on collaborative teaching style. This finding was comparable to a study conducted in Egypt by Kassab *et al*. [15] during the face-to-face problem-based teaching, where students perceived tutors as suggestive-assertive in their instructional behavior, while faculty perceived themselves as facilitative-

collaborative. Using a modified version of TSI in higher education, a study conducted for online faculty teaching style perceptions of students and faculty in two universities from United Arab Emirates found that both students and faculty perceptions on decision making and behavioral teaching styles that was similar to the facilitative teaching style of the present study [12].

Table 1. Survey response rates from students and faculty

Study population	Total (N)	Responded N (%)	Female N (%)	Male N (%)
Students	508	392 (77)	243 (62)	150 (38)
Faculty	75	48 (64)	32 (67)	16 (33)

Table 2. Perception differences of teaching styles among students and faculty

Teaching styles		Students' perception N (%)	Faculty perception N (%)	p-value
Facilitative teaching style	Facilitative	156 (40)	26 (54)	0.1
	Neutral	117 (30)	14 (29)	
	Not facilitative	119 (30)	8 (17)	
Collaborative teaching style	Collaborative	164 (42)	29 (60)	0.05
	Neutral	119 (30)	13 (27)	
	Not collaborative	109 (28)	6 (13)	
Suggestive teaching style	Suggestive	207 (53)	34 (71)	0.07
	Neutral	104 (27)	8 (17)	
	Not suggestive	81 (21)	6 (13)	
Assertive teaching style	Assertive	213 (54)	30 (62)	0.06
	Neutral	94 (24)	10 (21)	
	Not assertive	85 (22)	8 (17)	

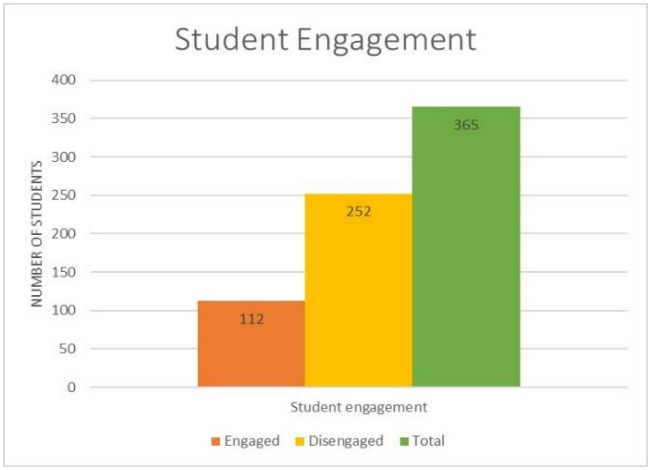

Figure 1. Students' engagement during online classes

According to the current survey, 112 (31%) students were actively engaged in their online classes, whereas 252 (69%) were disengaged. The reasons for students' disengagement of the present study finding may be comparable with a study in which 72% of students expressed that low participation during lectures harmed their online learning experience. Students also reported declines in live lecture engagement and attendance. Many students said they had trouble keeping in touch with their classmates and teachers as well as controlling the pace of their assignments [19]. Another study by Dost *et al.* [1] found that students did not find instructional material online to be interesting or engaging and that there were few opportunities for them to raise questions. Additionally, when asked if online instruction should be more interactive, students tended to be uninterested but did not think it was as effective as in-person instruction [1].

The present study shows nearly half of the students thought the faculty's online teaching methods were suggestive and aggressive, as opposed to 164 students (42%) who thought the professors were collaborative and 156 (40%) students who thought they were facilitative. According to a research study by Tabatabaeichehr *et al.* [19], medical science students' satisfaction with online learning during the COVID-19 pandemic was 51.8%. Based on Ahmed *et al.* [20], systematic review and meta-analysis, 57% of medical students were happy with online education. E-learning is associated with positive learning outcomes, showcasing high levels of learning achievement and the development of higher-order thinking abilities.

Another study done on clinical year students, explored how technology was used to ensure that residents continued to receive the necessary training despite the restrictions on in-person interactions. Virtual tools and platforms were employed to conduct lectures, discussions, and even some practical training sessions. while virtual training cannot completely replace hands-on surgical experience, it serves as a valuable supplement. It allows for the continuity of education and helps residents stay on track with their training programs [21].

One of the study findings indicate that the sudden shift to online learning led to significant changes in the delivery of medical education. On the positive side, online learning increased flexibility and accessibility, allowing students to attend lectures and complete coursework from anywhere. However, there were also negative aspects, such as decreased opportunities for practical experience and reduced interaction between students and instructors. Hybrid model could provide the benefits of both formats, ensuring that students receive comprehensive education while also gaining practical skills [22]. This is attributed to the flexibility provided by e-learning, enabling learners to actively engage in the learning process at their convenience and from any location [23], [24].

A systematic review provides a comprehensive assessment of virtual medical teaching during the COVID-19 crisis, highlighting that the online teaching played a crucial role in ensuring the continuity of medical education during the pandemic. It was found to be effective in delivering educational content and maintaining academic progress. The study also pointed out several challenges, including technical issues such as poor internet connectivity and difficulties in accessing online platforms and there was a noted reduction in student engagement, as the virtual format made it harder to create interactive and participatory learning environments [25]. COVID-19 pandemic is an opportunity for medical education taking a drastic curricular change towards a blended learning for that both students and teachers need adoptability towards an effective learning environment by modifying the instructor behaviors to sustain student engagement during online sessions.

For the future change in technologically enhanced medical education, research on basic evidence on the perceptions and expectations of students and instructors is desirable. However, a significant challenge in e-learning emerges is in the form of a higher dropout rate [26]. The reduced interaction between learners and teachers in e-learning environments, stemming from geographical distance, results in lower engagement levels compared to traditional learning settings [27]. There is a need for adaptability among educators, to quickly learn and utilize new technologies. Technological proficiency is crucial, as educators need to be comfortable with various online tools and platforms to effectively deliver their courses. The successful online medical teaching depends not only on the technology used but also on the teacher's skills in creating an interactive and dynamic virtual classroom [28].

In terms of student participation, the present study found that most of the respondents experienced disengaged in their online studies. In order to increase student motivation and active participation in the virtual learning environment, this raises a troubling issue that requires consideration. Patra *et al.* [29] discussed the challenges and opportunities of e-learning in a medical college during the pandemic. They identified several issues, including limited access to technology for some students, difficulties in maintaining student motivation, and the lack of face-to-face interaction, which is essential for developing practical skills and building relationships with peers and instructors. However, the study also highlighted the opportunities presented by e-learning. Online platforms can reach a larger number of students and facilitate innovative teaching methods, such as virtual simulations and interactive modules [29]. Furthermore, e-learning poses challenges for the development of self-regulated capacities in learners, and those who struggle with self-regulation may encounter difficulties in engaging with the learning materials [30].

The present study emphasizes the need for ongoing support and adaptation to make online medical education more effective. This includes providing students with the necessary technological resources, training educators in effective online teaching strategies, and continuously evaluating and improving online courses. To better understand the underlying causes of the observed perception differences and to create strategies that support good student engagement and satisfaction in online medical education, more research is still required.

The study's strength lies in its substantial sample size, encompassing 392 students and 48 faculty, providing a robust dataset for analysis. However, limitations should be acknowledged, notably the study's restriction to a single medical college and the exclusion of clinical year students. These limitations may impact the generalizability of findings to the broader medical education landscape.

To develop an engaging and effective learning environment that meets the changing needs of medical students and ensures the delivery of high-quality medical education, collaborative efforts and continual assessment of teaching methods are required. Students' motivation and enjoyment of the learning process can be increased by using engaging and interactive teaching methods including multimedia presentations, virtual simulations, and encouraging learning exercises. The satisfaction of students also depends on instructors' quick feedback and assistance.

4. CONCLUSION

The present study showed a significant perception difference among students and faculty on faculty online teaching collaborative style. The 31% of students engaged with online classes when the faculty practiced a collaborative and facilitative method of teaching. To develop a promising and efficient learning atmosphere that fulfils the changing requirements of medical students and ensures the delivery of high-quality medical education, collaborative efforts and continual assessment of teaching methods are required. Students' motivation and enjoyment of the learning process can be increased during online or blended courses, by using engaging and interactive teaching methods including multimedia presentations. Medical students are more likely to be satisfied with online instruction when instructors give prompt responses to questions, insightful criticism of work, and individualized coaching. Despite the difficulties, focusing on these important aspects might help students be more satisfied with online teaching strategies and improve their learning experience in virtual classrooms.

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