**Online classes as an undergraduate Teaching-Learning Method: A SWOT Analysis**

**Abstract**

**Introduction:** Traditional classroom teaching is being replaced by newer modalities where multimedia technologies are involved in the teaching process. The advantages of online learning were proven in the literature. But the limitations in carrying out online classes for undergraduate dental education need to be sought.

**Objective:** To assess the perceived strengths, weaknesses, opportunities, and threats in online teaching and learning.

**Methodology:** Two different proformas on Online Teaching and Learning were given to all teaching faculty and students in Government Dental College, Thiruvananthapuram, Kerala. Data was collected using online google forms. Descriptive statistics were used to assess the perspective of teaching faculty and students on online classes. A semi-quantitative content analysis was done for open-ended items.

**Results:** Strengths, Weaknesses, Opportunities, and Threats of Online teaching and learning were identified based on the quantitative and qualitative findings. A total of 164 students and 44 teaching faculty responded to our proforma. 59.8% of students and 90.9% of teachers perceived high flexibility of time in Online teaching. 31.7% of the students perceived high self -motivation to learn from online classes whereas 46.5% of the teachers perceived less self -motivation for students from online classes. Technical issues were considered as the main drawback in online teaching and learning by 97.7% of teachers and 89% of students. More interactive online sessions and procuring technical support from institutions were perceived as opportunities in online teaching and learning. Accessibility issues and Health issues were perceived as threats in online classes as a teaching-learning method by students.

**Conclusion:** Well-outlined course content with proper scheduling, free Wi-Fi access, well prepared and committed teaching faculty, creating a sense of responsible online learning supplying devices to access online classes to all students in the state are the few areas of implementation for better learning outcomes in online learning.

**Keywords:** Teaching- Learning Method, SWOT Analysis, Online teaching, Strengths, Weaknesses, Opportunities, Threats.

1. **Background**

Dentistry is a mix of knowledge, skills, and perseverance. Undergraduate Dental Education in India is a 4.5-year course with one year compulsory rotatory internship programme1. The pattern of the Dental Education system has been witnessing changes over the years. The predominance of female dental students, increase in the number of private colleges,changes in exam pattern are a few of the many changes happening in Dental Education2

Ensuring the quality of dental education, despite having utmost importance remains a dawdling question in the minds of dental teachers. Whether the dental professionals are equipped with the skills required for their clinical practice, research, and training of undergraduates and postgraduates still remain unknown owing to the limitations of current evaluation methods.

Over the years,literature elicited various learning methods in the undergraduate curriculum. They vary from chalk and talk methods, combination of audio visual methods to problem-based learning and blended classroom methods3–5.

From the traditional teaching method, multimedia technology has started progressing slowly and is being widely used in designing the learning module. This was followed by interactive web- based learning applications as in Blended Classroom method3.

But of late, we have seen many teachers following the same traditional pattern of teaching. The reasons for this may be due to lack of confidence in using multimedia or reluctance to change or lack of proper guidelines.

Thus, the traditional classroom teaching is transformed into a different setting where Information and Communication Technology and multimedia technologies are involved in the learning process. The role of a teacher is changed from purely providing information to a facilitator and mentor4. Teachers share the process of decision making with students so that they owe a share of responsibility.

The cognitive domain of students from merely gaining knowledge has been changed to enhance their learning skills, promoting critical thinking and problem-solving skill. Thus, the cognitive, affective, and psychomotor domains of learning are being evolved among students.

There are many different online learning tools available today varying from Zoom, google classroom, interactive whiteboard etc6.There are many massive open online courses (MOOC) conducted by the Government of India and autonomous bodies. But whether these courses are accessible to all groups of people is questionable.

Though there are a lot of advantages of online learning in students, there may exist drawbacks especially in dental education, which remain unexplored. This study aims to explore the perspective of teachers and students regarding online classes as a teaching-learning method (TLM).

1. **Objective**

To assess the perceived strengths, weaknesses, opportunities, and threats of online classes as a teaching-learning method perceived by teachers and students of a tertiary dental care center in southern Kerala.

1. **Methodology**

A cross-sectional study was conducted among all the teaching faculty (including postgraduate students and senior residents) and undergraduate students in Government Dental College, Thiruvananthapuram, Kerala. Two different proformas were designed to assess the perspective of teachers and students regarding online classes as a teaching-learning method. The proformas were designed after a thorough literature search7–9 on different teaching methods involved in higher education. The items in the proforma for online teaching were taken from a study done in the University of Albania8 and online learning from a survey done by the division of undergraduate education inCalifornia10 . Data was collected using online google forms, the initial part of which explained the study to the participants and obtained their informed consent. The ethical clearance for the study was obtained from the Institutional Ethics Committee. The link to the Google forms was made available to the participants and reminders were sent at an interval of 3 days. Those study participants who failed to respond even after 5 reminders were excluded from the study. Any doubt regarding filling up of the form was clarified by the investigators through the mobilenumber and email provided. Data so obtained was collated in Microsoft excel and analyzed using SPSS trial version 23. Descriptive statistics were used to assess the perspective of teaching faculty and students on online classes. A semi-quantitative content analysis was done for open-ended items.

1. **Results**

Strengths, Weaknesses, Opportunities, and Threats of Online teaching and learning were identified based on these quantitative and qualitative findings

A total of 164 students [Forty-four (88%) from the first year,39(81.3%) from the second year, 41 (87.2%) from the third year, and 40(71.42%) from the final year] responded to Online learning proforma. There were One hundred and thirty-seven (83.7%) female and sixty-seven male (16.5%) students. The mean age of the students was 21.69+1.29.

Forty-four teaching faculty responded to online teaching proforma, amongst which 25(56.8%) were females and 19(43.2%) were males. The mean age was 39.28+9.39. 43.2% of them take 1-2 online classes per week

**4.1 Online Teaching Modalities**

Online learning was not preferred by 96 (58.5%) students. Smartphones were used by 143(87.2%) students as a device for online learning. Fifty- seven (34.8%) of them have heard of zoom and google classrooms before the start of online classes.

Fifty- nine (36%) students preferred face to face online classes. Ninety-three (56.7%) students and 40 (90.9%) teachers felt that face to face online classes involving two-way interaction was the most effective online teaching modality. Sixty (36.6%) students felt overburdened with online learning

Zoom (84.1%), Google classroom (68.2%), a combination of both (52.3%) were the commonly used online platforms in teaching. Performance of students was assessed through assignments and online viva by 43.2% of the teaching faculty. Other assessment methods followed were quizzes, group debates, and online exams.

Only 7(15.9%) teaching faculty uploaded their teaching video and 15(34.1%) provided the students with a supporting YouTube video for better understanding.

Thirty-one (70.5%) teachers believed that online classes enhance the institution's reputation. Thirty- nine (79.5%) were concerned about intellectual property rights while sharing online materials. Fifteen (34.1%) of them opined that only some colleagues talk positively about online teaching.

70.5% of teaching faculty have not attended any Massive Open Online Course. NPTEL courses were attended by 9.1% of the faculty. Apart from technical issues, those who have attended MOOC (Massive Open Online Course) felt that the inputs of eminent faculty from various institutions made the courses more informative and interesting.

Fifty-five students felt that more classes are being taken online than direct classroom teaching. Easy accessibility, less workload, and flexibility of time for faculty are the possible reasons cited by 64 (84.2%) respondents on the increasing number of online classes. Twenty-five (56.8%) teaching faculty agree to this, the flexibility of time is the main reason opined by 69.2% of teachers.

**4.2 Comprehending Subjects through Online learning**

37.9% of the students felt difficulty in understanding all subjects especially ones requiring practical knowledge, through online learning. 72.7% of the first-year students perceived the decreasing order of understanding subjects through online learning as Anatomy, Dental Anatomy, Biochemistry, and Physiology. Pathology has been perceived as the most difficult to learn among 12.7% of second years. 17% of the third-year students found General medicine, General surgery, and Oral Pathology difficult to comprehend in online learning. All the clinical subjects in the final year especially Prosthodontics, Oral Surgery, Conservative Dentistry,and Orthodontics had been perceived as difficult to understand concepts through online learning by 64.2% of final year students

**4.3 Distractions in Online Learning and Teaching**

Distractions felt by the students during online classes, from both student's perspective and the teacher's perspective are depicted in Table 1. Comparison of different items in Online learning to Classroom learning according to student's perspective and teacher's perspective on students is shown in Table 2 and Comparison of different items in online teaching to classroom teaching according to teacher's perspective on teachers in Table 3

**4.4 Level of Satisfaction in Online learning and teaching**

When we assessed the overall level of satisfaction in Online learning, it was found that 18(11%) students were very much less satisfied and 85(51.8%) were less satisfied, 36(22%) students felt equal satisfaction in both online and classroom learning and high satisfaction was seen among 19(11.6%) students.

84(51.2%) students preferred a combination of direct classes and online classes after this Corona Pandemic period. Online classes alone were not preferred by 122 (74.4%) students. The level of expertise and satisfaction in Online teaching is depicted in Figures 1 and 2.

SWOT analysis as perceived by teachers and students on Online classes as an undergraduate teaching-learning method (TLM) is shown in Table 4.

1. **Discussion**

We are living in an era where digitalization is turning to be an important component of the medical education curriculum. Online modalities of learning are widely accepted in western countries, but in India owing to the infrastructure and technical constraints, direct classroom teaching is preferred. This may be because clinical expertise, student's communication skills, and ability to deal with unpredictable patient behavior, cannot be assessed in online learning.

According to teachers and students, online learning ensured convenience in accessing teaching materials and teachers at any time. This advantage of online learning had been supported in many studies11–13.

Students felt that self -motivation to learn is more for online learning whereas teachers felt there is less self-motivation among students. This may be due to the less interaction felt by the teachers from the student's side, less response during online class, delay or dishonesty in submitting the assignments. Contrary evidence exists if students perform equally well in online classes and face-to-face classes14. Hence self-motivation to learn was not visible among students in our study. This is contrary to a study done in Pakistan where both students and teachers felt that students became self-directed learners12. Literature addressed self-directed learning as an important competency to be attained in medicaleducation10,15,16 To enhance self-efficacy and motivation, online classes involving face to face, two-way communication has proven to be effective17.

Technical issues were the main drawback felt by the students during online learning. Though many companies have provided internet packages at a feasible rate, it is difficult to procure them for many as living itself is questionable in these pandemic days. The economic development of the country plays an important role in higher education18. The range issues exist in the varied terrain of Kerala. The Government should take measures to ensure free WIFI facilities to the educational institutions and students to facilitate non-disruptive learning.

Distraction at the student's end significantly affects online learning. The presence of family members, the smell of food, messages from friends affect their learning process. A study has proven that concurrent instant messaging negatively affects task efficiency19. Distractions at home may be one of the reasons why most students opt for hostel accommodation for attaining better learning outcomes. One of the most important life skills to be attained especially in this pandemic era is to learn how to be indistractable.

Mismanaged decorum and attaining psychomotor skills were considered as the main drawbacks of online learning. Only the cognitive component has been proven to be effective in online medical education12. In our study, nearly 38% of the students find it difficult to understand subjects requiring practical exposure. This can be reduced to a certain extent through simulated patients and displaying clinical demonstration videos. History taking involving communication skills and clinical reasoning skills of students can be assessed in this way. In our study, only 34% of the teaching faculty had used supporting video material for online classes. The reason may be due to the less interest in online teaching owing to several factors that need to be addressed effectively.

More than half of our teaching faculty experienced difficulty in handling the students during online classes as compared to direct classroom teaching. The lack of physical presence of teachers may be one of the reasons for the increased undisciplined behavior seen among students during online teaching.

Teachers and students opined that net costs involved in online teaching are high as they might have ignored the transportation costs, hostel fees, mess fees, or maybe the internet costs seem to be higher than all these costs. Online learning was proven to be less expensive as the course material and conveyance costs are negligible as compared to traditional learning14,20

Health issues like headaches and pain around the eyes were perceived as threats in online learning by the students. According to Wang in 2012 online learning pose a major risk to the emotional and physical health of health of students21. More evidence needs to be created on the health issues due to online teaching and learning.

Only 34.1% showed a positive attitude toward online teaching which may be due to the reluctance of teaching faculty to learn about new teaching modalities. Nearly 30% of the teaching faculty who showed a positive attitude had previous exposure to massive open online courses. In a study done in Tanzania, 47% of teachers showed a negative attitude towards e-learning, and less computer exposure was cited as one of the main reasons for thenegative attitude 22. Teachers being the key stakeholders of education, their positive attitude is essential for refining our education system.

1. **Conclusion**

SWOT analysis of Online classes as a teaching-learning method shed light on the areas to be concentrated on to improve our existing undergraduate education system. Well-outlined course content with proper scheduling, free Wi-Fi access, well prepared and committed teaching faculty, creating a sense of responsible online learning among students which helps in overcoming the distraction at student's end and increasing the interaction with teachers and students, supplying smartphones or any device to access online classes to all students in the state are the potential areas of implementation for better learning outcomes in online learning.

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**Declaration of interest**: None

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**Figures**

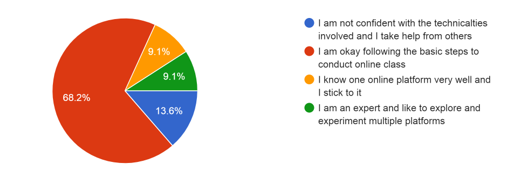


Fig 1: Level of expertise in Online Teaching

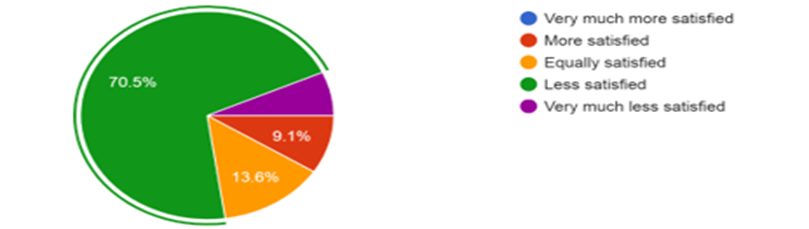


Fig 2: Level of satisfaction in Online teaching among teaching faculty

**Tables**

**Table 1: Distractions felt by the students during Online Classes**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No** | **Distractions felt by the students during Online class** | **N (%)**  **YES** | **N (%)**  **NO** | **Total** |
|  | Phone call at teacher’s end- Students perspective  Teachers perspective | 27(16.5) | 95(57.9) | 122(74.2) |
| 29(65.9) | 6(13.6) | 35(79.5) |
|  | Phone call at student’s end- Students perspective  Teachers perspective | 62(37.8)  32(72.7) | 68(41.5)  8(18.2) | 130(79.3)  40(90.9) |
|  | Food/beverages at teacher’s end- Students perspective  Teachers perspective | 3(1.8)  12(27.3) | 111(67.7)  9(20.5) | 114(69.5)  21(47.7) |
|  | Food/beverages at student’s end- Students perspective  Teachers perspective | 19(11.6)  18(40.9) | 97(59.1)  7(15.9) | 116(70.7)  25(59.1) |
|  | Presence of others at teacher’s end- Students perspective  Teachers perspective | 27(16.5)  20(45.5) | 95(57.9)  8(18.2) | 122(74.4)  28(63.6) |
|  | Presence of other’s at student’s end- Students perspective  Teachers perspective | 89(54.2)  27(61.4) | 45(27.4)  6(13.6) | 133(81.6)  33(75) |
|  | Technical Issues- Students perspective  Teachers perspective | 146(89)  43(97.7) | 12(7.3)  1(2.3) | 158(96.3)  44(100) |
|  | | | | |

**Table 2: Comparison of different items in online learning to class room teaching according to student’s perspective and teacher’s perspective on students**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Items** | **High** | **Equal** | **Low** | **Total** |
|  | Flexibility of time- SPS  TPS | 98(59.8)  40(90.9) | 21(12.8)  2(4.5) | 40(90.9)  40(90.9) | 137(83.5)  44(100) |
|  | Chance of attending the class-SPS  TPS | 86(52.5)  20(46.5) | 21(12.8)  11(25.6) | 38(23.2)  12( 27.9) | 145(88.4)  43 (97.7) |
|  | Self-motivation to learn- SPS  TPS | 52(31.7)  12(27.9) | 33(20.1)  11(25.6) | 51(31.1)  20(46.5) | 136 (85.3)  43 (97.7) |
|  | Interaction with teachers SPS  TPS - | 51(31.1)  11 25.6 | 17(10.4)  7 16.3 | 68(41.5)  24 55.8 | 136(85.3)  43(97.7) |
|  | Interaction with other students- SPS  TPS | 46(28.1)  9(22.5 | 17(10.4)  7 (17.5) | 71(43.3)  24 (60) | 134(81.7)  40 (90.9) |
|  | Honesty in submitting assignments- SPS  TPS | 66(40.2)  11(26.2) | 44(26.8)  10 (23.8) | 32(19.5)  21 (50) | 142 (86.6)  42 (95.5) |
|  | Practical skills- SPS  TPS | 33(20.1)  6 (16.2) | 13(7.9)  5 (13.5) | 82(50)  26 (70.3) | 128 (78)  37 (84.1) |
|  | Procrastination- SPS  TPS | 66(40.2)  26 (65) | 32(19.5)  11 (27.5) | 35(21.3)  3 (7.5) | 133 (81.1)  40(90.9) |
|  | Distractions at student’s end- SPS  TPS | 84(51.2)  35(83.3) | 26(15.9)  5 (11.9) | 32(19.5)  2 (4.8) | 142 86.6  42(95.5) |
|  | Distractions at teacher’s end- SPS  TPS | 52(31.7)  19(47.5) | 32(19.5)  10 (25) | 48(29.3)  11(27.5) | 132 (80.5)  40(90.9) |
|  | Convenience to learn- SPS  TPS | 56(34.2)  29(67.4) | 37(22.6)  9 (20.9) | 42(25.6)  5 (11.6) | 135 (82.3)  43(97.7) |
|  | Costs involved in learning - SPS  TPS | 68(41.5)  32(84.2) | 32(19.5)  3 (7.9) | 35(21.3)  5 (13.2) | 135 (82.3)  38 (86.4) |
| SPS- Student’s Perspective on Students; TPS- Teacher’s Perspective on Students | | | | | |
|  | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Items** | **High** | **Equal** | **Low** | **Total** |
|  | Teacher’s flexibility of time | 40(90.9) | 2(4.5) | 2(4.5) | 44(100) |
|  | Ease of handling students | 10 (23.3) | 9 (20.9) | 24 (55.8) | 43(97.7) |
|  | Ease in delivering lectures | 18(40.9 | 16(36.3) | 10(22.7) | 44(100) |
|  | Convenience of teachers | 32(72.7) | 5(11.4) | 7(15.9) | 44(100) |
|  | Net costs involved in teaching | 30(69.8) | 5(11.6) | 8(18.6) | 43(97.7) |
|  | Distractions at students end | 22(52.4) | 9(21.4) | 11(26.2) | 42(95.6) |
|  | Distractions at teachers end | 35(83.3) | 5(11.9) | 2(4.8) | 42(95.6) |

**Table 3: Comparison of different items in online teaching to classroom teaching according to teacher's perspective on teachers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Strengths** | **Weaknesses** | **Opportunities** | **Threats(as perceived by students)** |
| Flexibility of time and convenience for both students and teachers | Less interaction with teachers and other students | More sincerity and Commitment needed by teachers | Accessibility issues |
| Increased Chance of attending the class among students | Technical issues | A guideline document with proper scheduling of classes for every institution | Hardto Concentrate |
| More Self -motivation to learn from student’s perspective | Less self- motivation to learn from teacher’s perspective | More interactive online sessions to be conducted | Health issues |
|  | Distraction at student’s end and teacher’s end | Technical support and other logistics at institutional level |  |
|  | No Practical exposure |  |  |
|  | More Procrastination |  |  |
|  | High costs involved in teaching and learning |  |  |

**Table 4: SWOT analysis as perceived by teachers and students on online classes as an undergraduate Teaching-Learning Method (TLM)**