

# Perception of Dental Students of Karnataka on Effectiveness of e-Learning during Covid-19 Pandemic – A Questionnaire Based Survey

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## ABSTRACT

**Aim:** e-learning has currently been used as a medium of education due to the COVID-19 pandemic. This survey was conducted to evaluate the effectiveness of e-learning class among the dental students of Karnataka and adding a note on their concerns regarding their future plans. **Materials and Methods:** A questionnaire was created with questions aiming at the effectiveness of e-learning and the concerns of the students regarding their future plans using the Google docs. It was circulated among the dental students of Karnataka using various social media platforms. **Results:** A total of 406 students completed the survey and nearly half of the respondents (51.1%) were glad to attend online mode of digital learning (73.3%). Of all the respondents, accessibility (88%) and problems related to poor internet connection (55.1%) was not reported as an issue. However, the state of mind of the students (79.9%), psychological stress (72.6%), and the lack of confidence in the clinical/ practical work (83.6%) seemed to be a major concern. A significant concern regarding their future plans was observed

in terms of getting a job (58.3%), overseas studying (87.5%), and majority of them felt the requirement of additional training (85.5%). **Conclusion:** Despite good acceptance and adaptation to this new learning environment, the pandemic has shown to influence the future plans of the students. **Key words:** COVID-19, e-learning, Future plans, Google docs, Questionnaire.

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## INTRODUCTION

Scientists identified a novel coronavirus (SARS-CoV-2) after an outbreak of pneumonia with an unknown etiology in Wuhan, China, in December 2019. SARS-CoV-2 causes severe acute respiratory syndrome. The pathogen was discovered to be the seventh member of the coronavirus family to infect humans, and the disease it produced is known as 2019 corona virus disease or COVID-19. The World Health Organization proclaimed COVID-19 an international emergency posing a public health concern on January 31, 2020. (WHO).<sup>1</sup> Following this, the WHO declared the COVID-19 outbreak a global pandemic on March 11, 2020.<sup>2</sup> Direct contact as well as airborne transmission, even from an asymptomatic carrier, are determined to be the modes of transmission for this virus. As a result, extreme steps were adopted at the international and national levels to decrease the danger of transmission, with a focus on preventing social gatherings.<sup>3</sup> Consequently, people's movement and day-to-day activities have been curtailed, leading to the implementation of a work-from-home policy for several employment sectors<sup>4</sup> and the closure of schools and colleges across the country.<sup>5</sup> Organizations such as the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the Office of the United Nations High Commissioner for Human Rights (OHCHR), the International Federation of the Red Cross and Red Crescent Societies (IFRC), and the World Health Organization (WHO) have advised governments to provide well-prepared, acceptable, adaptive, and accessible education settings in schools and universities to all students following a temporary shutdown in the event of a pandemic.

The intention was to promote distant online learning and various delivery strategies.<sup>3</sup>

Learning that takes use of Information and Communication Technologies (ICTs) is referred to as e-learning.<sup>5</sup> This online learning platform offers students the ability to learn anywhere and at any time by providing continuity of education, problem-based learning.<sup>6</sup>

Although the potential of online classes is boundless, institutions encounter obstacles in incorporating both academic and clinical components of dental education into an online format.<sup>4</sup> Difficulties with the university's digital platform, as well as interruptions in student's internet connection, were occasionally observed.<sup>6</sup> According to several studies, student's attitudes have ranged from complete acceptance of online classes over traditional teaching techniques to total dissatisfaction.<sup>4</sup> The evaluation of digital learning in an unprepared setting of transition from traditional classroom learning during unforeseeable circumstances such as a pandemic disease has yet to be investigated.<sup>3</sup>

In this light of information, a questionnaire – based survey was conducted among the dental students of Karnataka to evaluate their satisfaction and perception regarding the effectiveness of e-learning and highlighting the concerns faced by them regarding their future plans.

## MATERIALS AND METHODS

Using an online survey portal (Google Docs) the survey was prepared. The questionnaire was prepared according to few of the key articles<sup>1,3-4</sup>

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that were selected. Via smart phones, the link was circulated through social media and E-mail among the dental students of Karnataka. The study was approved by the Institutional Ethical Committee. Before the start of the survey, students were given an informative text, and only those students who volunteered to participate completed the survey.

The questionnaire was split into sections. The first part of the questionnaire, dealt with the demographic data of the participant which included the gender, age, level of study. The second part consisted of evaluation questions that was again subdivided into two parts. The first part was allocated to online class satisfaction, the attitude toward the online class and lecturer evaluation (1 – 18). The second part consisted of questions that was focussed at the future plans of the participants (19 – 23).

## RESULTS

A total of 406 students across the state of Karnataka participated in the survey. Out of the 406 respondents 298 (73.3%) were between the age group of 18 – 24 years and 108 (26.6%) ranged between 25 – 30 years (Table 1) and the gender were also equally distributed with 171 (42.1%) respondents being males and 235 (57.9%) being females (Table 1). When the level of study of the participants was analyzed about 65.1% of the participants were undergraduate students and 33.9% of them were postgraduates while 1% of response were others (house surgeons) (Table 1).

### Online classes

The evaluation on the online class began with the question of how the participants felt about moving to digital learning in which almost 51.1% of the participants answered that they were glad to attend these classes whereas 29.3% of them felt that the experience was not good and almost 19.6% of the participants worried that they won't be able to achieve as much as in their classroom. On asking the participants about the mode of digital learning majority of them i.e 73.3% answered that it was through online classes and the remaining 25.3% of them replied that it was through recorded classes and 49.3% of them replied that they spend 4 hr for the class and 32.8% of them spent 2 hr for the classes and 81.5% of them felt that the time allocated for these online classes was sufficient. From the total of 406 respondents, when asked if they had an easy access to online class, almost 88% of them said yes and 53.3% of them accessed it through mobiles and the remaining 43.7% had access through laptops, wherein only 12% of them had difficulties in assessing the digital learning. When a question about facing problems due to poor internet connection almost 55.1% of them said yeas and 24.6% of them said that they face problems sometimes but not generally. 79.9% of the respondents felt that

the online classes affected their state of mind toward studying and 72.6% of them felt that they were prone to more psychological stress due to these online classes. Also, when asked whether the participants will lack confidence in their clinical/ practical work 83.6% of them said yes. When the participants were questioned if they were able to interact with their teachers 79.6% answered yes. When a question regarding the teacher in using the video conferencing app was asked almost 72.4% of them said yes stating that the teachers were well trained in using the apps. 67.7% of the respondents replied that they had a good experience in taking the online exam and only 23.2% gave a negative response. Finally, 83.3% of the participants felt that the online classes need further improvement and 57.6% of them answered that they don't want the online classes to be implemented after the pandemic (Table 2).

### Future plans

Four questions regarding the future plans of the participants were included and 58.3% of them felt that due to the pandemic getting a job is worse than before. A majority of 87.6% of the participants felt that there is a reduced opportunity for studying overseas, also 85.5% of them replied that they require additional training as they have got insufficient practical knowledge due to the pandemic situation. And also, a question regarding any other future plans and the effect of the pandemic on it was asked 84.9% of them felt that the other future plans has also been affected (Table 3).

## DISCUSSION

The onset of an unforeseen pandemic disease necessitates significant adjustments to typical everyday activities and lifestyles, including educational processes.<sup>3</sup> These physical barriers have had a significant impact on dental education,<sup>7</sup> forcing educational institutions all over the world to adapt and embrace online learning technologies. This prompted educational institutions to become acquainted with various online learning methods and forums.<sup>4</sup> Hence the current survey was designed to evaluate the student's perspective on the effectiveness of the E learning classes and bringing into light their concerns regarding their future plans in these unexpected situations.

Analyzing the demographic data suggested that 235 were females and 171 were males out of which 298 of them were within the age group of 18 – 24 years and the remaining 108 of them were between the age group of 25 – 30 years suggesting that the survey's demographic data was well distributed. However almost 263 respondents showed that they were undergraduates and are prone to have more difficulties in adjusting to these new trends. A similar conclusion was given by Kharmia MY *et al.* in their survey article where all the dental students who were young showed maximum fear in returning to dental practice.<sup>8</sup>

The use of e-learning gives a major advantage for the students, as they can access the E material provided anytime and work in their areas of weakness to improve their knowledge.<sup>9</sup> E learning has gained the students interest as it helps them to plan their individual learning, enhances their decision making, voice their opinions and reflections as given by Meckfessel *et al.*<sup>10</sup> A similar philosophy was given by Brumini *et al.* who showed a positive opinion about E learning within the dental students.<sup>11</sup> A similar conclusion was drawn in our present study (51.1%).

For any information to be efficaciously delivered to the students a good internet connectivity, hardware technology and the skills to use of the media is required as given by Liu *et al.*<sup>12</sup> With the increased use of smartphones in the recent times, most of the students (53.3%) preferred using these to attend the online classes. Sarwar *et al.* in his study has shown that students of the medical and dental fields have shown a progressive learning approach with the use of smartphones.<sup>4</sup>

**Table 1: Demographic data of the participants.**

Question	Percentage
<b>Age</b>	
18-24 years	73.3%
25-30 years	26.6%
<b>Gender</b>	
Male	42.1%
Female	57.9%
<b>Level of study</b>	
Undergraduates	65.1%
Postgraduates	33.9%
Others	1%

**Table 2: Online classes.**

Statement	Category	Frequency (n)	Percentage
How do you feel about moving to digital learning?	I am glad to attend these classes	206	51.1%
	I worry that the experience is not that good	118	29.3%
	I worry that I won't be able to achieve as much as in classroom	79	19.6%
Mode of digital learning?	Recorded classes	101	25.3%
	Online classes	293	73.3%
	Others	6	2.4%
Do you have access to digital learning?	Yes	351	88%
	No	48	12%
How do you get access to online classes?	Mobiles	215	53.3%
	Laptops	176	43.7%
	Browsing centres	11	2.7%
	Others	1	0.2%
Do you face problems with the online lessons due to poor internet connection?	Yes	222	55.1%
	No	82	20.3%
	Sometimes, but not generally	99	24.6%
Do you think that the online classes affect the state of mind towards studying?	Yes	322	79.9%
	No	81	20.1%
Do you think that you are prone to more psychological stress because of change in environment during online classes?	Yes	289	72.6%
	No	109	27.4%
Due to the online classes do you think you will lack the confidence in your clinical/practical work?	Yes	332	83.6%
	No	65	16.4%
How long do you spend for online class in a day?	2 hr	132	32.8%
	4 hr	198	49.3%
	6 hr	70	17.4%
	More than 6 hr	2	0.4%
Do you think that the time allotted for online class is sufficient?	Yes	326	81.5%
	No	74	18.5%
Does the online class need further improvement to support the learning process?	Yes	333	83.3%
	No	67	16.8%
Are you able to interact with your teachers during online class?	Yes	317	79.6%
	No	81	20.4%
Do you think the teachers are well trained for online classes and are able to use the video conferencing app with ease?	Yes	286	72.4%
	No	109	27.6%
Should the online classes be implemented even after the crisis?	Yes	228	57.6%
	No	168	42.4%
How was your experience of taking an online exam?	Good	268	67.7%
	Bad	92	23.2%
	Never want to take again	36	9.1%

Another obstacle in the e-learning is the poor internet connection (55.1%) which leads to a reduced efficiency of the online classes.<sup>13</sup> Similar results were seen in a survey among undergraduate dentistry students conducted by Sarwar *et al.* where the students reported that they had an internet connection which was rated to be average to poor.<sup>4</sup>

Schlenz *et al.* in their questionnaire-based survey article showed that a total change in the learning environment from face – to – face learning to e-learning, was challenging for both the lecturer's as well as the students.<sup>7</sup> The responses to our survey question regarding the psychological stress and state of mind of the students showed similar results.

Majority of the participants (83.3%) felt the need in improving the online learning which is in accordance with the results published by Al Taweel *et al.* where the students also emphasized that the online learning needed further improvement.<sup>3</sup> An efficient e-learning can be determined by the quality of the online lectures which is in turn governed by the individual students preference of learning, design of the multimedia used, the excellence in the quality of the images in display, the audio delivered, the speed of the internet connection and the method of delivery.<sup>13</sup>

Enhanced environment for E learning can be created when the lecturers have the essential skills for the use of technology, strategic teaching

**Table 3: Future plans.**

Statement	Category	Frequency (n)	Percentage
How do you rate the effect of pandemic on the prospect of getting a placement or job?	Worse than before	229	58.3%
	No change / Same as before	134	34.1%
	Better than before	30	7.6%
Do you think the pandemic has reduced your opportunities for studying overseas?	Yes	345	87.5%
	No	49	12.4%
Do you think you require additional training as you have got insufficient practical knowledge due to the pandemic?	Yes	337	85.5%
	No	57	14.5%
Do you think that the pandemic has affected your other future plans for this academic year?	Yes	333	84.9%
	No	59	15.1%

and pedagogic ideologies.<sup>14</sup> Amir *et al.* in their study showed that students faced problems in communicating with their teachers which was however contradictory to our study.<sup>5</sup>

When the participants were questioned regarding experience on taking the online exam 67.7% of them replied to a positive response which is in accordance with the results of a study done by K Khalaf *et al.* who showed that the students were satisfied with taking an online exam.<sup>15</sup>

A new ideology was given by Kumar *et al.* wherein he states that E learning can be used as a platform for providing elective classes to cover the challenging topics as well as techniques for the exam going undergraduates.<sup>16</sup>

Dentistry requires hands on training for developing the clinical skills. An initiative by the University of Nebraska provides a database with digitalised slides for virtual microscopy. This platform consists of several E modules that helps the students to view slides and to perform hands on clinical works for oral pathology. A similar E module can be incorporated to cover the slide demonstration for undergraduate third year students.<sup>17</sup> The conventional wax-up procedures as a part of pre-clinical prosthodontic curriculum can be best simulated with computer aided designs.<sup>18</sup>

Four questions regarding the concerns of the students on their future plans were included in this survey, and 85.5% of the respondents strongly believed they require additional training in their clinical/practical work as with the E learning comes a void in patient exposure and clinical cases.<sup>19</sup> This resonates with the study conducted by Sarwar *et al.* where most of the students felt that the online demonstrations of clinical or laboratory work were not as useful as conventional face-to-face learning.<sup>4</sup> Some of the future recommendations that were made are, reorganization of the clinical internships as per the regulations for dental treatments, use of artificial intelligence programs and simulators to deliver the pre-

clinical practical and other surgical techniques.<sup>9</sup> Faculty development programs can also be conducted to improve the skills to deliver both theoretical and practical knowledge.<sup>16</sup> Further, a visual explanation of practical works should be augmented as it is considered as the strength of e-learning.<sup>20</sup>

## Future Directions

Due to the uncertainty prevailing, developing the technological aspects of the digital platforms of institutions can be beneficial to the students. Incorporation of offline clinical demonstration videos of the basic surgical techniques in the field of exodontia and periodontics by their respective institutional faculty will be more relatable to the students. In the exam point of view, conducting more of case presentations, group discussions of multiple clinical scenarios will be helpful. As mentioned in the discussion developing advanced applications for different pre-clinical procedures can be a future for blended learning.

## CONCLUSION

The results of this study show that even though there is good acceptance and quick adaptation of the students to this growing trend of E learning, it has its share of disadvantages. However, when these obstacles are rectified, it would pave a new way for a including online classes as a part of the routine curriculum. Also, the results show that the students are concerned regarding their future plans. Taking this into consideration, providing additional training in clinical/practical works would be beneficial to the students.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ABBREVIATIONS

**COVID 19:** Coronavirus Disease 19; **WHO:** World Health Organization; **e-learning:** Electronic learning.

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