

Digital Dilemmas: Unraveling the Challenges of E-Learning

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Abstract

Introduction: The COVID-19 caused universities to switch from conventional face-to-face learning to the technically advanced online learning method. We must identify practical alternatives to equip our graduates with the required skills to overcome the challenges it has brought forth. The aim of the study was to investigate the challenges dental students and faculty members encounter during e-learning.

Methodology: Qualitative methodological framework was used. The setting was Rawal Institute of Health Sciences, a private medical and dental college in Islamabad, Pakistan. Semi-structured interviews were conducted with the dental students and faculty until the point of saturation was achieved. The data were recorded, manually transcribed and thematic analysis was done to derive the results.

Results: There were a total of 29 interviews conducted, out of which 15 were of students and 14 were faculty members of Rawal Institute of Health Sciences. 3 themes and 11 sub themes were generated regarding the challenges faced during e-learning.

Conclusion: The key finding was that, despite the fact that both students and faculty desired to continue e-learning and take the initiative, they preferred to avoid it due to the lack of resources and inadequate training that made it difficult for them to move outside of their comfort zones. Yet, if the right tools are made available, e-learning in dental schools has a bright future.

Keywords: Challenges, Dental, E-learning, Digital dilemma

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Introduction

E-learning is the use of internet technologies to deliver a range of instructional modes that enhance a student's knowledge, skills and performance.¹ Learners can customize their experiences with the use of e-learning technology to meet their

own learning objectives. This can be achieved as they have control over the subject material, learning strategies, pace and time. It is regarded as a more modernized kind of remote learning.² The introduction of e-learning into medical education can lead to the adoption of adult learning theory. It emphasizes teacher's roles as competency evaluators and facilitators of learning instead of knowledge distributors.¹ The use of e-learning in dental medicine is widely accepted across the world.³ Universities across the globe are promoting e-learning as a teaching and learning method.

The novel coronavirus (COVID-19) disrupted dental education worldwide owing to the social distancing policies which were adopted as a necessity to stop the spread of the

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pandemic.⁴ Dental schools all over the world had to close due to the pandemic. It underlined the requirement for alternate educational routes and worked as a catalyst for embracing online learning. Despite the impact on field of the education, COVID-19 can be credited for introducing online learning and making us aware of its potential as an efficient means of pedagogical teaching and learning.² The thriving innovative technologies and learning management systems have given educators a way out in the form of e-learning.⁵ E-learning has been found to be on par with or better than traditional learning.⁶ Clinical instruction and chair-side sessions with patients are essential components of the dental curriculum. Due to the difficulties brought on by the pandemic, it is imperative that we find workable alternatives to provide our graduates with the necessary skills.⁷

Before the pandemic, Pakistan had a rudimentary online education presence. However, during COVID, educational institutes were left with no option other than to familiarize themselves with different online learning modalities and forums in the matter of a fortnight. To make this transition a smooth sail, it is essential to know the challenges that are being faced by the dental students and the faculty members.

The students of today belong to the millennial generation⁸ and generation Z⁹ and are considered experts in the use of technology. Most of the teachers are labelled as old-fashioned¹⁰ and not considered proficient in the use of technology. The challenges faced by both during e-learning might be different from each other, but we cannot shy away from the fact that they both face certain challenges.¹⁰ In Pakistan, the students and the teachers are still getting acquainted with this new system of teaching and learning and, in due process, are facing some challenges. It is essential to know the challenges being faced by them so that measures can be taken to make this transition easy for them and

improve it for the future.⁵ The aim of this study is to highlight the challenges faced during e-learning in order to understand the problems that hinder the smooth transition from conventional learning methods to e-learning. The rationale of the study is to understand the challenges and then only can they be overcome so that better teaching methodologies can be implemented in our country.

Methodology

Literature search was done using the keywords challenges, e-learning and dental schools on search engines and grey areas like PubMed, Scopus, Cochrane, Research Gate and Google Scholar. Related articles were then reviewed to see if they fit in the inclusion criteria set for the research. The articles or researches were then shortlisted and checked for any duplicates. After doing a review of the finalized articles following results were found out as indicated in the PRISMA flowchart (Fig. 1) below.

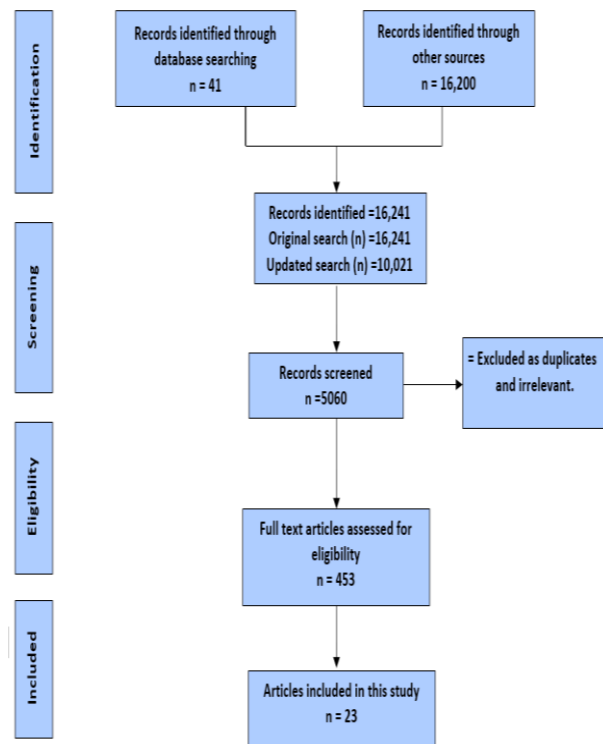


Fig. 1: PRISMA Flowchart

The research was conducted at Rawal Institute of Health Sciences (RIHS), a private medical and dental college in Islamabad during time period of 06 months. Traditional face-to-face teaching approaches were used at RIHS until 2019. In 2020, closed public gatherings were discouraged to limit the spread of COVID. Schools and colleges across Pakistan had to take advantage of technological innovations and implement the paradigm of e-learning. This concept was unfamiliar to both students and faculty at RIHS. The study had two groups of participants involved. The first group comprised of dental students from all the professional years. Basic and Clinical faculty from the dental school made up the second group. Those students and faculty members who had the chance to participate in online learning and traditional teaching were included. All the students and faculty members who had not had the chance to participate in both traditional and online teaching and learning were not deemed eligible for this study and had not given/taken an assessment by studying/teaching via both modes.

Prior to starting the study, approval was taken from the Institutional Review Board of Rawal Institute of Health Sciences. Informed consent from the willing participants who fell into the inclusion criteria was also taken. It was made sure that the ethical code was given prime importance. Confidentiality of the participants was maintained in the interviews taken. The information provided was only used for this study.

The interview guide¹¹ was developed keeping in mind the objectives of this study. It was validated by piloting it with two students and two teachers. After the authentication of the interview guide, the process of data collection began. The interviews were conducted until the point of saturation was reached. All the interviews were conducted by the primary researcher. The interviewer remained the same for all the conducted interviews to

maintain uniformity. The data obtained from the interviews was not shared with other participants to maintain the element of blinding. Interviews were taken in English. The venue for the interviews was Rawal Institute of Health Sciences (RIHS). Written consent was taken from the interviewees. The interviewees were quickly briefed about the topic and the questions in the guide. The interviews were either conducted face-to-face or over the phone. They were audio recorded digitally from a mobile phone after taking permission from the interviewees. The data was stored in a password-protected personal laptop. The interviews were transcribed by the primary researcher on the same day the interviews were conducted on. The audio recording was carefully listened to by the primary researcher while sitting in a separate room and in complete silence. Once the interview had been transcribed, it was read again to make sure that it conveyed the same context it was said in. The transcribed data were analyzed thematically¹² using a manual approach. The data was analyzed using content analysis. First, coding was done by identifying key points and labeling them. Similar codes were then grouped together, which helped in organizing the information and recognizing patterns. From this process, 11 subthemes were identified, highlighting various barriers faced by dental students and faculty members. These subthemes were then reviewed and combined into 3 main themes that captured the core issues expressed during the study.

Result

The challenges that were brought to light after taking the interviews are summarized in the table below (Table I). Pakistan is a resource-limited developing country. The biggest issue with e-learning that surfaced has to do with the scarce resources. Power shortage and poor internet connectivity were amongst the most common presentation. Frequent load shedding of electricity majorly

affected e-learning by disrupting electronic devices. Additionally, a poor internet framework leads to unstable connectivity causing student teacher communication barrier during e-learning. The socio-economic disparity further aids to in equal access to appropriate hardware and software needed. Psychomotor skills must be taught through hands-on experience which need sophisticated 3D softwares that require a fast internet bandwidth to operate. It came to light that learning or understanding a subject effectively requires a conducive environment, such as a classroom or lecture hall where there are no distractions. It was also discovered that cheating on online assessments is relatively easier. Applications such as Zoom and Dropbox have restricted functionality in their free editions; to fully utilize these programmes, one needs to acquire the premium version. The difficulties of e-learning are further exacerbated by inadequate IT support and limited IT compliance of the stake holders. The process is further hampered by understaffed IT workers and faculty members. Additionally, the infrastructure must be conducive to online education.

Theme	Sub Theme
Limited Resources	Electricity Internet Devices
Academic Challenges	Unconducive class environment Clinical Skills Assessment/Invigilation
Administrative Challenges	Premium access of applications Non-compliance with E-learning Tools IT Staff Understaffed Faculty Infrastructure

Table I: Challenges of E-learning

Discussion

The present study aims at finding out the challenges or the disablers faced by both the

dental students and the faculty members during e-learning.

Electrical supply was cited as the main difficulty by both the dental students and the faculty members. This barrier of e-learning in Pakistan has been noted in various studies. Since e-learning utilizes electronic gadgets, it needs a constant supply of power. Unfortunately, in a developing nation like Pakistan,¹³ this issue is still far from being handled. An uninterrupted internet connection is necessary for e-learning. Although numerous internet service providers have made substantial investments in Pakistan in an effort to offer a seamless internet connection, the country's low resources remain a barrier, particularly in the rural areas. During e-learning, an unstable internet connection was mentioned as a problem. It is consistent with other relevant research carried out in Pakistan.¹⁴ Participants desired fast internet speed and high broadband connections to help improve their online learning experience, since they were dissatisfied with the internet service that was being offered.

E-learning is dependent on the usability and accessibility of technological devices such as personal computers, laptops, tablets, and smartphones, in comparison to campus-based in-person learning. The lack of software-compatible devices was cited as a drawback by the study's participants. In contrast to the current study, a prior study¹⁵ on E-learning modalities conducted in Pakistan found that medical and dental students use smartphones and tablets, but that use is primarily for recreation. The use of such devices has not yet spread to the academic echelons and been common throughout our nation.

The participants of this study disagreed with earlier research on e-learning in Pakistan, citing non-campus environments as unconducive to learning as they had no full time supervision. According to a related study, however, the ability for dentistry students to learn at their own pace made the

e-learning environment comfortable for them to learn in. Similar to earlier studies¹⁶ on the topic, our study also revealed that participants struggled to track their academic progress in online courses and also encountered inconsistencies in assessment processes.

The difficulty of interacting with the teachers and patients effectively was another significant drawback mentioned by the students. This shortcoming has been noted in a number of other nations, including Saudi Arabia,¹⁷ Malaysia,¹⁸ and India.¹⁹ These outcomes are in line with one from Pakistan²⁰ as well. In line with the findings of the earlier study,²¹ the participants in the current study did not feel clinically competent to treat the patients. The development of psychomotor skills is emphasized heavily in the dental curriculum in order to treat patients effectively and efficiently. Concerns were raised by the faculty concerning how to impart practical skills to dentistry students via online learning.

According to the professors, one of the biggest obstacles is not being able to assess the students' body language. The cameras were mainly off during the lectures, which may have been owing to the slow connection, the idea of privacy, or a social barrier, but it was still a hindrance. The identical disabler was also discovered in an earlier study²² on a related subject.

The teacher's competence to easily conduct online courses was critiqued by the students. This result can be attributed to the teachers' requirement to get acquainted with e-learning technology quickly and promptly. This outcome is consistent with research done on students in the medical and dental colleges of Pakistan including both the public and private sectors.¹⁴ It has been noted that young individuals frequently overstate their technological proficiency.²³ Most of the students, according to the study's participants, are unfamiliar with e-learning tools and lack even the most basic

understanding of how to use them. A comparable study conducted in Pakistan likewise reported on this noncompliance with the e-learning tools.¹³

Conclusion

The sudden shift to e-learning during the COVID-19 pandemic was a major disruption. Even after more than a year of adapting to online platforms, many dental students and faculty still found themselves struggling. Scarce resource, academic challenges and administrative issues were common. This study helped shed light on the real challenges faced by those at the heart of dental education. By truly understanding these issues, we can begin to improve the e-learning experience. With the right support and resources, there's real potential for digital tools to become a valuable part of how we teach and learn in dental schools.

Ethical Approval

The study was approved by the Institutional Ethical Review committee of Rawal Institute of Health Sciences, Islamabad. (ERC# Rawal/RDC/ERC/22/03)

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Conflict of Interest

It is declared that the authors don't have any conflict of interest.

Authors' Contribution

ZWZ: Conceptualization and Design Study

MNT: Writing – Final Draft

NS: Writing – Initial /Original Draft

WZ: Data Curation– Methodology, Validation and Formal Analysis

AA: Writing – Review and Editing

RS: Project Administration and Supervision

References

- Ruiz JG, Mintzer MJ, Leipzig RM. The impact of e-learning in medical education. *Acad Med.* 2006;81(3):207-12.
- Rhim HC, Han H. Teaching online: Foundational concepts of online learning and practical guidelines. *Korean J Med Educ.* 2020;32(2):175-83.
- Schulz P, Sagheb K, Affeldt H, Klumpp H, Taylor K, Walter C, et al. Acceptance of e-learning devices by dental students. *Med 2.0.* 2013;2(2):e6.
- Goh CE, Lim LZ, Müller AM, Wong ML, Gao X. When e-learning takes centre stage amid COVID-19: Dental educators' perspectives and their future impacts. *Eur J Dent Educ.* 2021;25(4):685-91.
- Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding e-learning during COVID-19 at a private medical college. *Pak J Med Sci.* 2020;36(COVID19-S4):S57-61.
- Tashkandi E. E-learning for undergraduate medical students. *Adv Med Educ Pract.* 2021;12:665-74.
- Nasseripour M, Turner J, Rajadurai S, San Diego J, Quinn B, Bartlett A, et al. COVID-19 and dental education: Transitioning from a well-established synchronous format and face-to-face teaching to an asynchronous format of dental clinical teaching and learning. *J Med Educ Curric Dev.* 2021;8:2382120521999668.
- Yakin M, Linden K. Adaptive e-learning platforms can improve student performance and engagement in dental education. *J Dent Educ.* 2021;85(7):1309-15.
- Shorey S, Chan V, Rajendran P, Ang E. Learning styles, preferences and needs of Generation Z healthcare students: A scoping review. *Nurse Educ Pract.* 2021;57:103247.
- Khatoun B, Hill K, Walmsley AD. Mobile learning in dentistry: Challenges and opportunities. *Br Dent J.* 2019;227(4):298-304.
- Zhang Z, Wu Q, Zhang X, Xiong J, Zhang L, Le H. Barriers to obtaining reliable results from evaluations of teaching quality in undergraduate medical education. *BMC Med Educ.* 2020;20(1):1-12.
- Coates WC, Jordan J, Clarke SO. A practical guide for conducting qualitative research in medical education: Part 2 – Coding and thematic analysis. *AEM Educ Train.* 2021;5(4):1-7.
- Sethi A. From text to e-text: Perceptions of medical, dental and allied students. *Heliyon.* 2022;8:e12157. Available from: <https://doi.org/10.1016/j.heliyon.2022.e12157>
- Sarwar H, Akhtar H, Muhammad M, Javeria N, Khan A, Waraich K. Self-reported effectiveness of e-learning classes during COVID-19 pandemic: A nationwide survey of Pakistani undergraduate dentistry students. *Pak J Med Health Sci.* 2020;14(4):34-43.
- Open Access. 'E-learning' modalities in the current era of medical education in Pakistan. *J Ayub Med Coll Abbottabad.* 2014;30(5):1156-8.
- Ansar F, Ali W, Khattak A, Naveed H, Zeb S. Undergraduate students' perception and satisfaction regarding online learning system amidst COVID-19 pandemic in Pakistan. *J Ayub Med Coll Abbottabad.* 2020;32(4):644-50.
- Al Zahrani EM, Al Naam YA, AlRabeeh SM, Aldossary DN, Al-Jamea LH, Woodman A, et al. E-learning experience of the medical profession's college students during COVID-19 pandemic in Saudi Arabia. *BMC Med Educ.* 2021;21(1):443.
- Chung E, Subramaniam G, Dass LC. Online learning readiness among university students in Malaysia amidst COVID-19. *Asian J Univ Educ.* 2020;16(2):45-58.
- Joshi A, Vinay M, Bhaskar P. Online teaching amidst COVID-19 in India: An outlook. *Asian J Distance Educ.* 2020;15(2):105-11. Available from: <http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/454>
- Abbasi MS, Ahmed N, Sajjad B, Alshahrani A, Saeed S. E-learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. *J Pak Med Assoc.* 2020;67(9):549-56.
- Cheema ZT, Hassan H, Kayani SB, Aslam T, Aziz S, Tasadaq A, et al. Comparative analysis of e-learning in private and public sector medical and dental institutes in Pakistan. *J Med Sci Clin Res.* 2022;10(16):731-4.
- Pieschl S. Will using the Internet to answer knowledge questions increase users' overestimation of their own ability or performance? *Media Psychol.* 2021;24(1):109-35. Available from: <https://doi.org/10.1080/15213269.2019.1668810>
- Madhav N, Oppenheim B, Gallivan M, Mulembakani P, Rubin E, Wolfe N. Pandemics: Risks, impacts, and mitigation. In: *Disease Control Priorities, Third Edition (Volume 9): Improving Health and Reducing Poverty.* Washington, DC: World Bank; 2017.