ORIGINAL ARTICLE

Perspective and Challenges of Dental Instructors on Implementing Blended Learning Models in A Private Dental College, Karachi, Pakistan

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OBJECTIVE: This study aimed to understand the perception of dental faculty members towards improving teaching and learning by using different methods in a private Dental College in Karachi, Pakistan.

Methodology: This descriptive cross-sectional study used an online questionnaire for over six months. Sixty teachers represented three different blended learning models. Non-probability convenience sampling was conducted among faculty members of a dental college in Pakistan. Descriptive statistics and analysis of variance (ANOVA) were used to evaluate responses, with a significance level set at α=0.05. Statistical analysis was performed using SPSS Version 17.0.

RESULTS: The survey revealed that most respondents, 68.3% agreed that teaching and learning using social media for educational purposes is straightforward, indicating a consensus on the accessibility of these platforms. Additionally, 76.7% of respondents agreed that communication between teachers and students through social media was effective, indicating the success of social media in promoting engagement and collaboration in educational settings.

CONCLUSION: The data show that Model 2 is the preferred and most effective model among dental educators for integrating social media into education. Model 2 outperformed the other models in using, communicating, interacting, and integrating classroom learning. Statistically significant differences confirmed its superior performance, making it the best choice for introducing the Internet in dental education. Implementing these strategies will significantly improve social media integration into dental education, resulting in more qualified dentists and better learning outcomes.

KEYWORDS: Blended methods, Dental Students, Dental Education, Teaching and learning

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INTRODUCTION

The growing use of the Internet and educational technologies has significantly changed higher education, leading many academic medical institutions to adopt distance and blended learning strategies.[1] Blended learning integrates in-person instruction with online education, offering a more flexible and engaging way to learn.[2] Research consistently shows that blended learning often outperforms traditional teaching in cognitive outcomes, particularly in health professions education.[3] It encourages collaborative learning, personalized instruction, and lifelong learning, enhancing critical thinking and knowledge acquisition.[4]

Blended learning is defined as an instructional approach that merges traditional face-to-face classroom methods with digital learning tools.[5] It gives students autonomy over the timing, location, pace, and direction of their learning.[6] The approach typically incorporates digital assignments, interactive content, virtual discussions, and self-paced modules that support and extend in-person classroom instruction.[7]

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A global scoping review by Arora et al. emphasized the importance of usability and instructional design in health professions' blended learning programs, identifying faculty members readiness as a key determinant of success.[8] Similarly, Jowsey et al. reported that blended learning programs in nursing improved accessibility and learner satisfaction, especially when personalized learning components were used.[4] MacNeill et al. highlighted that online and blended methods could enrich professional education but required thoughtful digital pedagogy and faculty members' engagement to be effective.[5] Evidence from a large-scale study by Zheng et al. during the COVID-19 pandemic found that online and blended modalities produced student outcomes equivalent to or better than pre-pandemic traditional teaching, reinforcing the potential of blended learning as a viable long-term approach.[6]

Studies in Pakistan have shown the use of blended learning in educational programs.[9,10] According to studies, when used successfully, blended learning can improve student achievement more than traditional face-to-face or entirely online techniques. However, successful implementation requires careful planning, appropriate technology, and proper training of teachers and students.[11] Online learning is not only important for teachers and teachers to promote good learning.[12] Direct Impact of Teacher Satisfaction on Student Engagement and Achievement in Online Classes.[13] They are important learning opportunities for students, given the benefits to themselves and their students.[14] Face-to-face integration with online instructional components has also been a concern for both teachers and students over the years.[15]

While such international findings are encouraging, most studies have focused on student perspectives or institutional outcomes. There is limited research exploring the experiences and challenges faced by faculty members, especially in low- and middle-income countries (LMICs) where digital infrastructure, training, and policy support are often inconsistent. In Pakistan, although blended learning is increasingly promoted, the transition from conventional to hybrid models has been complex and underexplored from the perspective of educators.

This study was conducted to assess the perceptions and challenges of dental faculty members in using three pre-existing blended learning models that incorporate social media at a private dental college in Karachi. The findings aim to contribute to the emerging discourse on digital pedagogy in LMICs by informing locally relevant strategies for successful blended learning implementation in dental education.

METHODOLOGY

Study Design

This was a descriptive cross-sectional study conducted at a private dental college in Karachi, Pakistan, from November 2021 to April 2022.

Study Setting and Participants

The study targeted faculty members actively engaged in teaching at the undergraduate dental level. A non-probability convenience sampling technique was used to recruit participants from multiple departments. All faculty members who were involved online or blended teaching and consented to participate were eligible. Faculty members who had not engaged in online teaching or who declined participation were excluded.

Sample Size

A total of 60 faculty members participated in the study. The six-month duration allowed sufficient time for comprehensive recruitment, considering academic schedules, departmental rotations, and teaching responsibilities across multiple semesters. This period also accounted for response variability due to varying levels of digital involvement among staff.

Blended Learning Models(16)

The study focused on three pre-existing blended learning models implemented by the institution during remote and hybrid teaching phases. These models varied in their structure and integration of social media into teaching practices:

- Model 1: Traditional classroom teaching supported by minimal use of social media (e.g., WhatsApp groups for announcements only).
- Model 2: Structured use of social media for interactive learning, including group discussions, real-time feedback, content sharing (videos, quizzes), and student-teacher engagement through platforms like WhatsApp, Facebook, and Google Classroom.
- Model 3: Predominantly asynchronous learning using pre-recorded lectures and digital materials, with limited live interaction or collaborative activities.

These models were not developed as part of the research but were already being used in the institution and thus provided a real-world comparison framework.

Data Collection Tool

Data was gathered through a self-administered, online questionnaire designed to capture faculty members perceptions on usability, communication, engagement, and overall effectiveness of each model. The questionnaire underwent an expert review for content relevance and clarity. Participation was voluntary and anonymous. The structured questionnaire was developed by the research team and validated through expert review by three senior dental education faculty members. It consisted of three sections: Demographics, which included gender, department,

and teaching experience; Perception of blended learning, which included 15 Likert-scale items (Strongly Agree to Strongly Disagree) covering ease of use, communication, interactivity, and accessibility of social media platforms within each model; and Effectiveness of each model, where respondents rated their agreement with statements related to teaching outcomes, student engagement, and instructional efficiency for each model. Pilot testing was conducted with five faculty members not included in the final sample to ensure clarity and reliability.

Data Collection Procedure

Data was collected over six months using a self-administered online questionnaire distributed via institutional email and WhatsApp faculty member groups. Weekly reminders were sent to maximize response rates. Faculty members were encouraged to complete the questionnaire at their convenience; each submission took approximately 10-15 minutes on average. A strict deadline of one month from the date of receiving the questionnaire was imposed, and consistent weekly reminders were shared to facilitate timely participation. Participation was voluntary and anonymous, and all participants were informed about the purpose of the study, confidentiality, and their right to withdraw at any time.

Statistical Analysis

Descriptive statistics were calculated for all variables, including frequencies, means, and standard deviations. One-way Analysis of Variance (ANOVA) was used to compare mean scores across the three blended learning models for each item. A significance level of α=0.05 was used for all tests, and statistical analyses were performed using SPSS version 17.0.

Ethical Considerations

Ethical approval for the study was obtained from the Baqai Dental College Ethical Review Board (Ref: BDC/ERB/2021/024). Verbal informed consent was obtained from all participants. Participation was voluntary, with assurance of confidentiality and the right to withdraw at any time.

RESULTS

Table 1 illustrates the frequency distribution of responses from dental personnel to various training models at a private dental institution. It asks about the ease and efficacy of using social media for teaching, collaboration, communication, and student participation. For example, most respondents believe that social media simplifies instruction and skill use, with 50% preferring Model 1. Similarly, 46.67% of respondents feel social media allows for faster connection with friends under Model 2. The table also demonstrates positive sentiments regarding social media in education, with 61.67% agreeing that it alerts users instantly in Model 2.

Table 2 evaluates the success rate of several teaching approaches among dental staff at a private dental institution, focusing on various aspects of social media use in teaching. The table shows the sum of squares, degrees of freedom, mean square, F statistics, and p-values for each item/question. Significant F statistics and low p-values (all less than 0.05) reveal significant differences between groups for each question. For example, "The communication between the teacher and the student using social media is simple and easy" indicates a highly significant difference ($F=10.05$, $p<0.001$), demonstrating diversity in the efficiency of the teaching methods in this aspect.

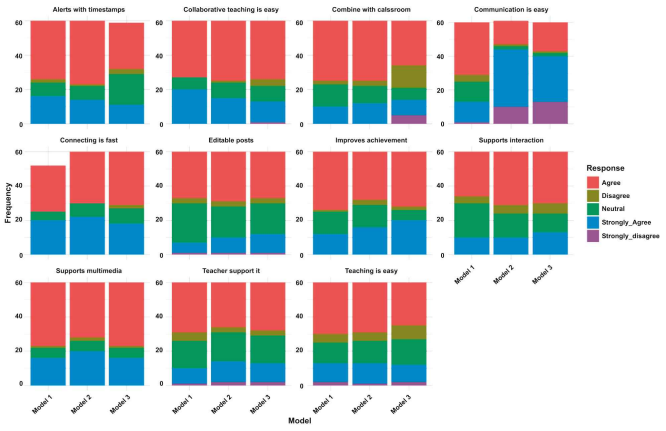
Table 1: Frequency Table of different Teaching Model among Dental Staff of Private Dental College

Items/ Questions		Model 1	Model 2	Model 3
it is easy to teach and have skill for using social media.	Strongly Agree	11(18.33)	12(20.00)	10(16.67)
	Agree	30(50.00)	29(48.33)	25(41.67)
	Neutral	12(20.00)	13(21.67)	15(25.00)
	Disagree	5(8.33)	5(8.33)	8(13.33)
	Strongly Disagree	2(3.33)	1(1.67)	2(3.33)
Use of social media to connect with friends is simple and fast.	Strongly Agree	20(46.67)	22(36.67)	18(30.00)
	Agree	27(45.00)	30(50.00)	31(51.67)
	Neutral	5(8.33)	8(13.33)	9(15.00)
	Disagree	-	-	2(3.33)
	Strongly Disagree	-	-	-
Discussion by posting with a reference sources, is easy for collaborative teaching.	Strongly Agree	20(33.33)	15(25.00)	12(20.00)
	Agree	33(55.00)	35(58.33)	34(56.67)
	Neutral	7(11.67)	9(15.00)	9(15.00)
	Disagree	-	1(1.67)	4(6.67)
	Strongly Disagree	-	-	1(1.67)
The communication between the teacher and the student using social media is simple and easy.	Strongly Agree	12(20.00)	9(15.00)	13(21.67)
	Agree	31(51.67)	34(56.67)	27(45.00)
	Neutral	12(20.00)	14(23.33)	17(28.33)
	Disagree	4(6.67)	2(3.33)	2(3.33)
	Strongly Disagree	1(1.67)	1(1.67)	1(1.67)
Teaching by social media provides Interaction, not only between the learners but also between learner(s) and the instructor.	Strongly Agree	10(16.67)	10(16.67)	13(21.67)
	Agree	26(43.33)	31(51.67)	30(50.00)
	Neutral	20(33.33)	14(23.33)	11(18.33)
	Disagree	4(6.67)	5(8.33)	6(10.00)
	Strongly Disagree	-	-	-
Discussion by posting on social media can be amended later on.	Strongly Agree	6(10.00)	9(15.00)	11(18.33)
	Agree	27(45.00)	29(48.33)	27(45.00)
	Neutral	23(38.33)	18(30.00)	18(30.00)
	Disagree	3(5.00)	3(5.00)	3(5.00)
	Strongly Disagree	1(1.67)	1(1.67)	1(1.67)
Social media has time and date stamp. When feeding a new post, it will alert to the user(s) immediate	Strongly Agree	16(26.67)	14(23.33)	14(23.33)
	Agree	34(56.67)	37(61.67)	32(53.33)
	Neutral	8(13.33)	8(13.33)	11(18.33)
	Disagree	2(3.33)	1(1.67)	3(5.00)
	Strongly Disagree	-	-	-
Teacher has a positive attitude towards the adoption of teaching and learning by using social media with various courses.	Strongly Agree	9(15.00)	12(20.00)	11(18.33)
	Agree	29(48.33)	26(43.33)	28(46.67)
	Neutral	16(26.67)	17(28.33)	16(26.67)
	Disagree	5(8.33)	3(5.00)	3(5.00)
	Strongly Disagree	1(1.67)	2(3.33)	2(3.33)
social media should be used in combined with teaching and learning in the classroom for various subjects.	Strongly Agree	10(16.67)	12(20.00)	9(15.00)
	Agree	35(58.33)	35(58.33)	26(43.33)
	Neutral	13(21.67)	10(16.67)	7(11.67)
	Disagree	2(3.33)	3(5.00)	13(21.67)
	Strongly Disagree	-	-	5(8.33)
Implementation of combined of teaching and learning by using social media in the classroom will improve student achievement.	Strongly Agree	12(20.00)	16(26.67)	-
	Agree	34(56.67)	28(46.67)	-
	Neutral	13(21.67)	13(21.67)	-
	Disagree	1 (1.67)	3(5.00)	-
	Strongly Disagree	-	-	
Teaching through social media can support multimedia in a various format including text, picture, video and animation	Strongly Agree	-	20(33.33)	16(26.67)
	Agree	-	32(53.33)	37(61.67)
	Neutral	-	6(10.00)	6(10.00)
	Disagree	-	2(3.33)	1(1.67)
	Strongly Disagree	-	-	-

Table 2: Comparing the Effectiveness of different Teaching Models among Dental Staff of Private Dental College

Items/ Questions	Comparison	Sum of Square	df	Mean Square	F Statistics	P value
it is easy to teach and have skill for using social media.	Between Groups	20.23	8	2.52	3.59	0.0023
	Within Groups	35.94	51	0.70		
Use of social media to connect with friends is simple and fast.	Between Groups	6.85	5	1.37	4.27	0.0024
	Within Groups	17.32	54	0.32		
Discussion by posting with a reference sources, is easy for collaborative teaching.	Between Groups	9.17	7	1.31	4.54	0.0005
	Within Groups	15.00	52	0.28		
The communication between the teacher and the student using social media is simple and easy.	Between Groups	27.01	7	3.85	10.05	<0.001
	Within Groups	19.97	52	0.38		
Teaching by social media provides Interaction, not only between the learners but also between learner(s) and the instructor.	Between Groups	20.89	6	3.48	9.37	<0.001
	Within Groups	19.70	53	0.37		
Discussion by posting on social media can be amended later on.	Between Groups	22.58	7	3.22	10.39	<0.001
	Within Groups	16.14	52	0.31		
Social media has time and date stamp. When feeding a new post, it will alert to the user(s) immediate	Between Groups	16.54	6	2.75	9.62	<0.001
	Within Groups	15.18	53	0.28		
Teacher has a positive attitude towards the adoption of teaching and learning by using social media with various courses.	Between Groups	22.61	7	3.23	6.79	<0.001
	Within Groups	24.72	52	0.47		
Social media should be used in combined with teaching and learning in the classroom for various subjects.	Between Groups	15.53	7	2.21	7.88	<0.001
	Within Groups	14.64	52	0.28		
Implementation of combined of teaching and learning by using social media in the classroom will improve student achievement.	Between Groups	10.33	3	3.44	10.42	<0.001

Figure 1: Comparative Analysis of different Teaching Model



DISCUSSION

Our study revealed that a substantial majority of respondents - 53 (88.3%) for Model 1, 57 (95.0%) for Model 2, and 50 (83.3%) for Model 3- agreed or strongly agreed that teaching and learning through social media was straightforward. This reflects a shared understanding of social media's accessibility and ease of use for educational purposes. Moreover, 43 (71.7%) in Model 1, 43 (71.7%) in Model 2, and 40 (66.7%) in Model 3 acknowledged effective communication between teachers and students via social media, underlining its value in enhancing engagement and collaboration in academic settings. Similar findings have been reported in studies where blended learning, particularly incorporating video presentations and demonstrations, improved students' knowledge and skill development for clinical years.[17]

Our data further demonstrate that Model 2 was the most preferred and effective among dental educators. It excelled in ease of use (n=41, 68.3%), communication (n=43, 71.7%), collaborative interaction (n=50, 83.3%), and integration into classroom instruction (n=47, 78.3%). These findings are supported by previous literature, which highlights how online tools like digital assignments, live classes, and video tutorials can support theoretical learning, though some skepticism persists regarding clinical skill acquisition via online modes.[18,19] Notably, students often found online sessions less interactive and preferred in-person activities, emphasizing the need for tailored and engaging teaching strategies by faculty members.[20]

Furthermore, 48 (80.0%) of faculty members using Model 2 agreed or strongly agreed that social media supports various multimedia formats (e.g., text, pictures, video, and animation), indicating its versatility in content delivery. Prior studies have also emphasized the advantages of online learning, such as reduced costs and travel time for faculty members.[21,22] However, concerns remain regarding the appropriateness of online platforms for teaching clinical and hands-on skills.[19,23]

Faculty members expressed optimism about integrating social media into dental education. In our study, 47 (78.3%) under Model 2 believed social media could enhance learning across various courses, while 50 (83.3%) agreed that its use in the classroom could directly improve student achievement. This aligns with global trends showing growing faculty satisfaction with online education when supported by proper training and institutional resources.[2,4,5]

Despite its strengths, including capturing current trends, offering contextual insights, and focusing on educational improvement, this study has limitations. It involved only one institution, lacked student perspectives, and did not fully address challenges posed by rapid technological advancement. These limitations highlight the need for multi-institutional studies involving both faculty members and students to generate more generalizable findings.[6]

In light of these findings, three key recommendations are proposed. First, dental schools should implement structured

training programs for faculty members focusing on digital pedagogy, social media ethics, and effective teaching strategies.[3] Second, institutions must improve infrastructure and accessibility by providing internet resources and devices. Third, fostering interactive environments through discussion forums and live engagement tools can enhance student participation and peer learning.[4] These interventions can significantly advance blended learning practices in dental education, especially in resource-constrained LMIC settings like Pakistan.

CONCLUSION

In conclusion, this study assessed dental faculty members' perceptions of three existing blended learning models that integrate social media into teaching. Among them, Model 2 was perceived as the most effective, showing statistically significant advantages in communication, engagement, usability, and classroom integration. While the study did not involve developing new models, it offers valuable insight into faculty members' experiences with institutional approaches already in use. These findings support the structured integration of social media to enhance dental education and suggest the need for faculty members' development and infrastructure support. Future research should incorporate student perspectives and include larger, multi-institutional samples to guide more comprehensive blended learning strategies.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICAL APPROVAL/ DISCLOSURE

This research has ethical approval from Baqai Dental College (ref: BDC/ERB/2021/024). All the participants gave verbal informed consent. During the data collection, there was a strong emphasis on voluntary engagement as well as the freedom to withdraw involvement at any moment and to ask any questions.

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None

AUTHOR CONTRIBUTION

AS conceptualized and designed the study, analyzed the data, and made the initial draft of the document. AW and AS provided guidance and ensured the quality of data collection and supervision. MAH and AI performed data analysis and assisted in the manuscript draft. AI, FK and F did the data collection and execution of the whole project. AS and MAH is involved in the literature search and editing manuscript. All authors reviewed the manuscript and provided valuable feedback. Every author read and approved the final version of the manuscript.

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