Assessing Dental Student and Faculty Views on the Transition to the Clinical Setting

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Abstract

Introduction: Dental education reform has been a focus for many schools over recent years, particularly in light of the COVID-19 pandemic. The purpose of the presented study was to assess faculty and student preferences for feedback styles, learning modalities in the clinical setting, and transitioning from the preclinical to clinical environments.

Methods: Two separate surveys were distributed to clinical faculty and students from classes of 2021, 2022, and 2023.

Results: Notably, faculty had significantly more favorable views on interpersonal dynamics within the student clinic compared to students ($p = 0.0255$). While students and faculty differed in their views on the transition from preclinical to clinical practice, clinical performance, and teaching/learning modality preferences, these results were not statistically significant.

Conclusion: Nevertheless, discrepancies in student and faculty responses to questions centering on feedback preferences, teaching/learning modality preferences, and transitioning to the clinical environment indicate potential avenues to explore for future development efforts.

Keywords: dental, clinical education, student feedback, faculty calibration

1. Introduction

The quality and effectiveness of dental education has been a focus of curriculum reform efforts for dental schools. For several decades now, dental education has undergone pedagogical transformations in the preclinical and clinical settings. Since the early aughts, there has been an increased emphasis on the biomedical sciences, interdisciplinary thinking, and evidence-based practice (Kassebaume & Tedesco, 2017). Moreover, an increased awareness of the social determinants of health has led to a greater emphasis on community-based dentistry as well as increasing diversity amongst the student body (DePaola & Slavkin, 2004). Following the 1995 Institute of Medicine's study, *Dental Education at the Crossroads* and the 2000 U.S. Surgeon General's report on *Oral Health in America*, many dental schools embarked on a period of refining their educational models to accommodate a more interdisciplinary and community-focused framework (Kassebaum & Tedesco, 2017). However, the state of dental education still remains open to optimization, with programs facing a simultaneous increase in the cost of educating students as well as a shortage of faculty (Henzi et al., 2007). Moreover, dental students report frustration regarding the inefficient nature of clinical education (Pyle et al., 2006). As institutions explore ways to improve their educational system, it is imperative that student concerns are gathered in a respectful yet productive manner (Kassebaum & Tedesco, 2017).

More recently, the emergence of the COVID-19 variant in December 2019 precipitated an abrupt transition to virtual learning. The importance of developing a core online curriculum was first emphasized in the 2009 Dental School Curriculum Format and Innovations Survey, though the need for an online-based curriculum was not fully realized until the pandemic. This adaptation from in-person to online learning also emphasized the importance of creating

deep-learning environments as opposed to those that encourage surface learning (Dolmans et al., 2016). Surface learning emphasizes memorizing information for the purpose of passing a test, whereas deep learning emphasizes education based on integrating ideas. The goal of deep learning is to encourage a more in-depth understanding of material and therefore improve long-term retention (Lindblom-Ylänne et al., 2019). By nature, online resources center on a surface learning paradigm, making it difficult to encourage the deep learning necessary for professional-level education (Zhang, 2013). The COVID-19 pandemic elucidated the need for developing focused efforts geared towards fostering the faculty-student relationship in an online learning environment while boosting the efficiency of preclinical and clinical education (Klaassen et al., 2021).

For such a hands-on field as dentistry, the shift to online didactics also raised concerns regarding quality control in dental education. Specifically, the practicality of online lectures, lack of interaction between students and faculty, and lack of student motivation have all been cited regarding the limitations of virtual learning (Farrokhi et al., 2021). The rapid transition from in-person to online didactics was unprecedented, and as such welcomes the implementation of a uniform and reliable method of collecting students' feedback across all dental schools for the purpose of continuously refining an educational paradigm that is now here to stay (Divaris et al., 2008). Numerous novel teaching protocols have been implemented in the past two years within dental schools to enhance pedagogical efficacy in online or asynchronous environments. For example, student feedback was used in the development of an online dental learning resource that demonstrated comparable results to synchronous virtual lectures with improved efficiency (Menon & Seow, 2021). While increased focus has been placed on pivoting towards non-traditional teaching strategies, there remains the ever-present need to optimize clinical dental education. In light of these changes, eliciting student feedback during their education has the potential to guide teaching techniques in real-time, improving the efficiency of clinical education in a time when pandemic-related closures may impact access to clinic time. Additionally, establishing avenues for student feedback would aid in creating consistency between faculty evaluation methods and respective criteria for curriculum competency (Henzi et al., 2006).

Allowing students to share their opinions on educational development encourages them to feel heard and supported, cultivating a healthy interprofessional relationship between faculty and students (McGrath et al., 2005). While numerous studies have examined dental students' opinions regarding such educational parameters as learning climate, student stress, and interactions with clinical educators, few have aimed to examine the favored learning modality amongst educators and students. Seeking feedback on the favored teaching and learning models from faculty and students, respectively, can help guide clinical education to be more streamlined while enhancing efficacy.

The purpose of the presented study was to compare the teaching and learning modalities most favored by faculty and students when learning a clinical procedure, and the similarities and differences in the qualities of an effective teacher from both students' and faculty's perspective in the teaching practice. The data elicited from the survey results could contribute to guiding practical recommendations for optimizing the learning experience before, during, and after the clinical procedure.

2. Method

2.1 Survey Design & Collection

This study was approved by the Institutional Review Board at Harvard School of Dental Medicine (IRB number 23843). Survey validity was confirmed using the Critical Appraisal Skills Programme (https://casp-uk.net/, 2019). Two separate surveys were sent to two study populations. The first study population consisted of students from the Classes of 2021, 2022, and 2023 at HSDM. Dental students were selected to participate given their exposure to clinical dentistry at the time of the survey. No individuals or groups were excluded from the study based on anything other than their enrollment in the Classes of 2021, 2022, or 2023. Students were informed of the content and purpose of the survey via an email to the class listservs. The survey was open from May 4, 2021 to July 1, 2021, with periodic reminders sent to students throughout the survey period.

The student survey included 15 questions, with the last question consisting of a write-in box for additional comments. Students were asked to provide their opinions on the transition from preclinical to clinical didactics, faculty guidance and instruction during this transition, the overall clinical learning environment, their performance in the clinic, their performed mode of receiving criticism in the clinic, their preferred learning modalities, and the qualities they most desire in an instructor. Specifically, the survey instrument had 6 sections divided by categories. Section 1 incorporated six questions related to overall clinical experience, expectations, and satisfaction. Responses ranging from strongly disagree to strongly agree were scored 1 to 5, respectively. Section 2 incorporated two questions related to performance during clinic sessions. Section 3 incorporated five questions related to interpersonal skills and

feedback during clinic sessions. Section 4 incorporated two questions focused on self-evaluation. Section 5 incorporated five questions related to preferred teaching modalities. Section 6 asked respondents to rank their preferred qualities in clinical faculty out of 10 possible choices, with 1 being the most important and 10 being the least important.

The second population consisted of full-time faculty, part-time faculty, and residents at HSDM. These groups were selected to participate given their role in clinical education. Faculty and residents were informed of the content and purpose of the survey via an email to their respective listservs. The survey was open from May 5, 2021 to July 7, 2021, with periodic reminders sent to instructors at two-week intervals within the survey period. The instructor survey included 16 questions, with the last question consisting of a write-in box for additional comments. The content of the survey questions was similar to the student survey, with questions written from the perspective of the instructor.

2.2 Statistical Analysis

First, univariate analysis was done to describe the sample characteristics. Statistical analysis of survey responses was based on each section of questions. For Sections 1 through 4, statistical significance was analyzed using the two-sample T-test, and results were confirmed with the Mann-Whitney test if normality assumption is not met. For the primary preferred teaching modality, statistical significance was assessed using Fisher's exact test. The results of the learning preference ranking in section 5 and clinical faculty qualities are discussed in the results section. All statistical analyses were performed using Stata/MP V.17.0 (STATACorp, College Station, TX, USA).

3. Results

With 48 respondents out of the 56 invited to participate, the response rate was 85.7% for the faculty survey. 25 (52.1%) respondents reported being full-time faculty, 21 (43.8%) reported being part-time faculty and 1 (2%) reported being a resident. Additionally, thirty-five respondents (72.9%) identified as a specialist while thirteen respondents (27%) identified as general practitioners. The plurality of respondents (18; 36.7%) consisted of faculty who worked at HSDM for longer than 10 years. The second most common response was 1-3 years (12; 24.5%), followed by 3-5 years (10; 20.4%), 5-10 years (7; 12.3%), and finally less than 1 year (2; 4.1%). With 38 respondents out of the 72 invited to participate, the response rate was 52.8% for the student survey. 8 (21.1%) respondents reported being Class of 2021, 16 (42.1%) reported being Class of 2022, and 14 (36.8%) from the Class of 2023.

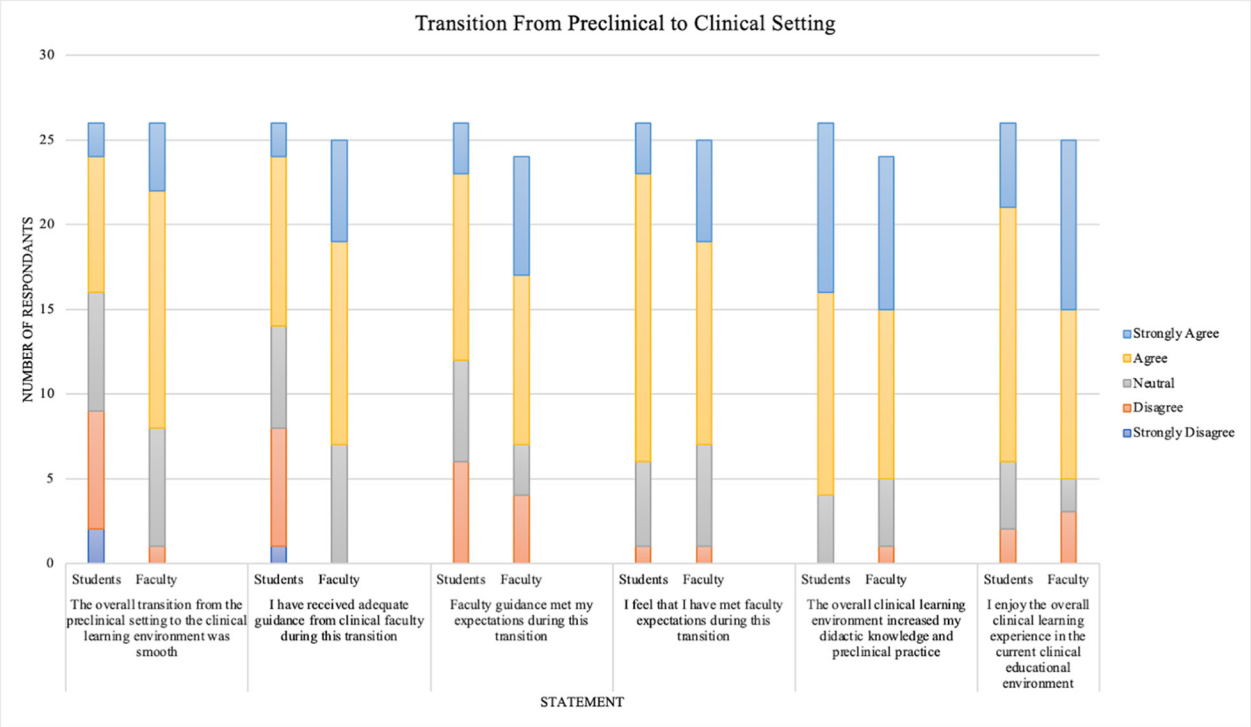

Figure 1. Student and Faculty Perceptions of Ease of Transition from Preclinical to Clinical Setting

The first section of the survey incorporated 6 ranking questions focusing on the overall clinical experience. The majority of faculty respondents stated that they either agree or strongly agree that this transition from the preclinical to clinical settings was smooth, that they were able to adequately guide students during this transition, that student and faculty expectations were mutually respected, that the clinical environment increased students' knowledge, and that the clinical teaching experience was enjoyable (Figure 1). Student respondents answered similarly, though the proportion of "strongly disagree" or "disagree" responses was higher compared to the faculty group. Nevertheless, this difference was not statistically significant ($p = 0.0946$).

The second section of the survey asked respondents to self-grade their performance in clinic and grade the performance of their faculty/student counterparts. Faculty and student respondents reported similar views of student performance in clinic. Conversely, faculty respondents self-graded their own performance more favorably than the student respondents' grade for faculty performance (Figure 2), though this difference was not statistically significant ($p = 0.6485$).

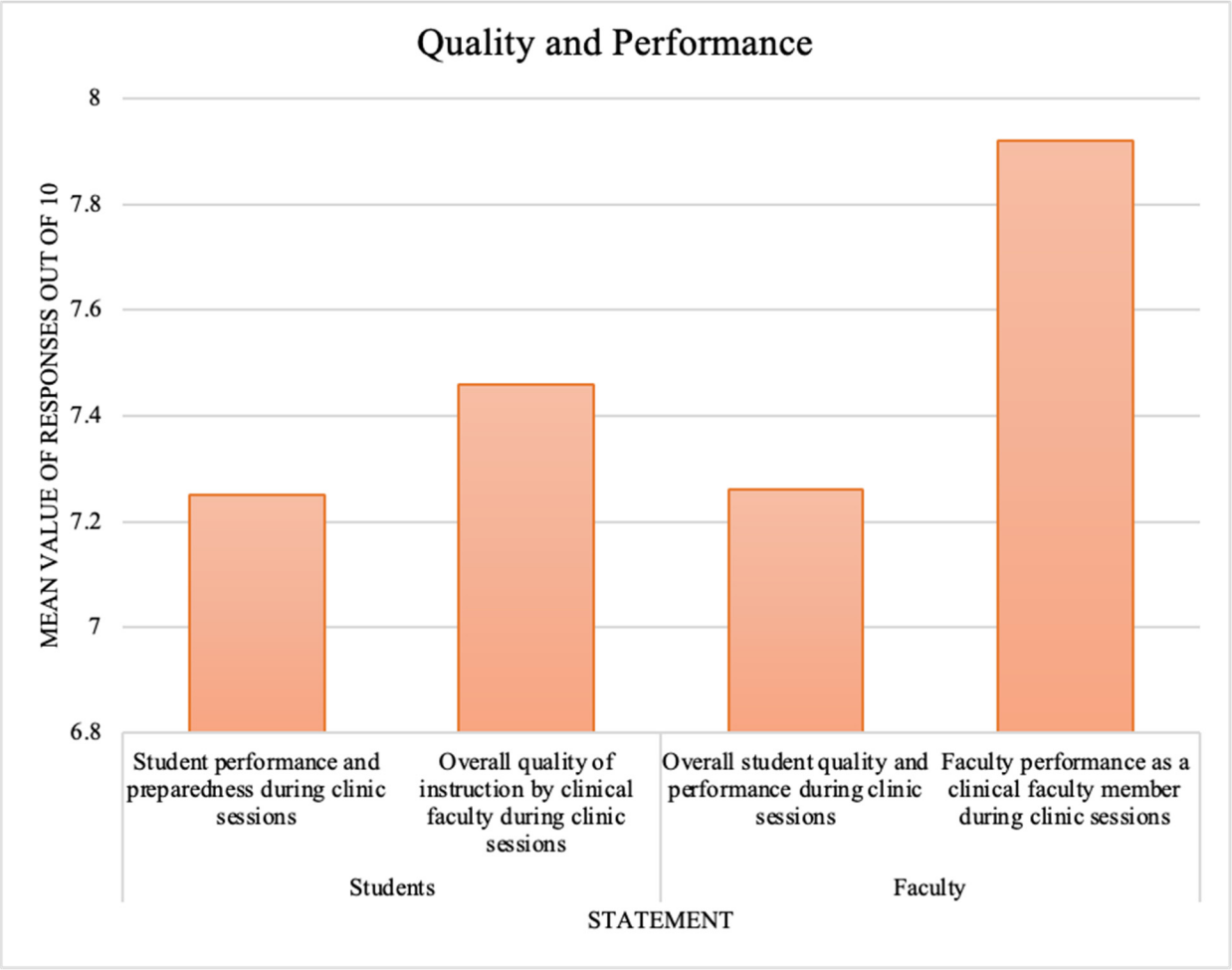

Figure 2. Perceptions of Student and Faculty Clinical Performance

The third section of the survey focused on interpersonal relationships, communication, and feedback styles in the clinical setting. The majority of faculty respondents indicated that they "agreed" or "strongly agreed" that interpersonal relationships between students and faculty are mutually respected, effective communication is established during clinic sessions, and faculty feedback influenced students' learning motivation in the clinical setting. The majority of student respondents answered similarly, though there was a greater number of "disagree" and "neutral" responses (Figure 3). On average, the faculty responses were significantly more favorable than the student responses ($p = 0.0255$).

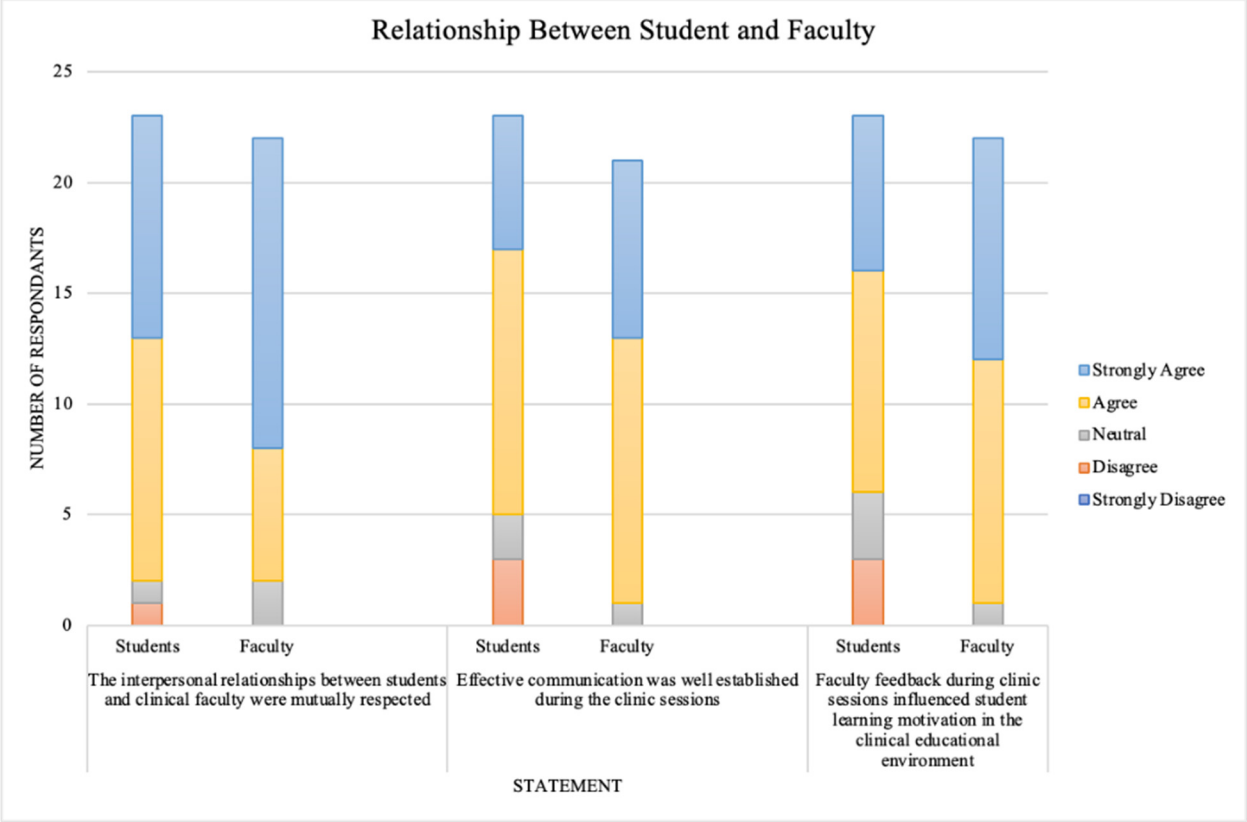

Figure 3. Perception of Interpersonal Relationships between Students and Faculty

Respondents were also asked to indicate their preferred method and timing of giving/receiving feedback in the clinic. The majority of faculty and student respondents indicated that they prefer continuous feedback throughout the procedure as necessary compared to feedback only at the end of the procedure. The majority of faculty respondents indicated that they prefer to give positive feedback first followed by constructive criticism, whereas the majority of student respondents indicated that they prefer the opposite (Figure 4), though this result was not statistically significant ($p = 0.071$).

The fourth section of the survey asked respondents to comment on the use of student self-assessments. The majority of both faculty and student respondents indicated that they "agree" or "strongly agree" that self-assessments were helpful in evaluating strengths and weaknesses of clinical skills. Similarly, the majority of student respondents indicated that their self-assessments agreed with faculty assessments "most of the time." As such, there was no statistically significant difference in responses for section four ($p = 0.1693$).

The fifth section asked respondents to comment on their preferred teaching modalities used in the clinic. A plurality of faculty respondents (43.8%) indicated they preferred a visual/diagrammatic explanation when teaching, followed by auditory/verbal explanation (37.5%) and kinesthetic/hands-on demonstration (18.8%). The majority of student respondents (60%) indicated they preferred a visual/diagrammatic explanation when learning, followed by kinesthetic/hands-on demonstration (35%) and auditory/verbal explanation (5%). The difference in faculty and student teaching/learning modality preferences was not statistically significant ($p = 0.058$) (fig. 5). Faculty and student respondents were asked to rank the type of teaching modality most used in the clinic, with visual/schematic explanations, auditory/verbal explanations, kinesthetic/hands-on demonstrations, and any combination of the previous choices as options. A plurality of faculty respondents (40%) indicated that they use a combination of kinesthetic, visual, and auditory modalities the most in the clinic. Importantly, a plurality of faculty respondents (40%) indicated that they use a combination of kinesthetic, visual, and auditory modalities the least in the clinic as well. A plurality of student respondents (45%) indicated that they use auditory explanations the most in the clinic. Similar to the faculty survey, a plurality of student respondents (45%) indicated that they use a combination of kinesthetic, visual, and auditory modalities the least in the clinic. Finally, respondents were asked to indicate the

optimal amount of time needed for sufficient guidance using each learning modality. In general, students indicated requiring more time under faculty guidance for all three types of learning modalities than faculty indicated, though these results were not statistically significant ($p = 1$, 0.326, and 1 for visual, audio, and kinesthetic modalities, respectively).

Finally, section six asked respondents to rank the characteristics of an effective clinical educator from most to least important. A plurality of faculty (42.9%) and student (25%) respondents indicated the most important characteristic of a clinical educator as "knowledge of subject." Similarly, a plurality of faculty (78.6%) and student (80%) respondents indicated the least important characteristic of a clinical educator as "years of teaching experience."

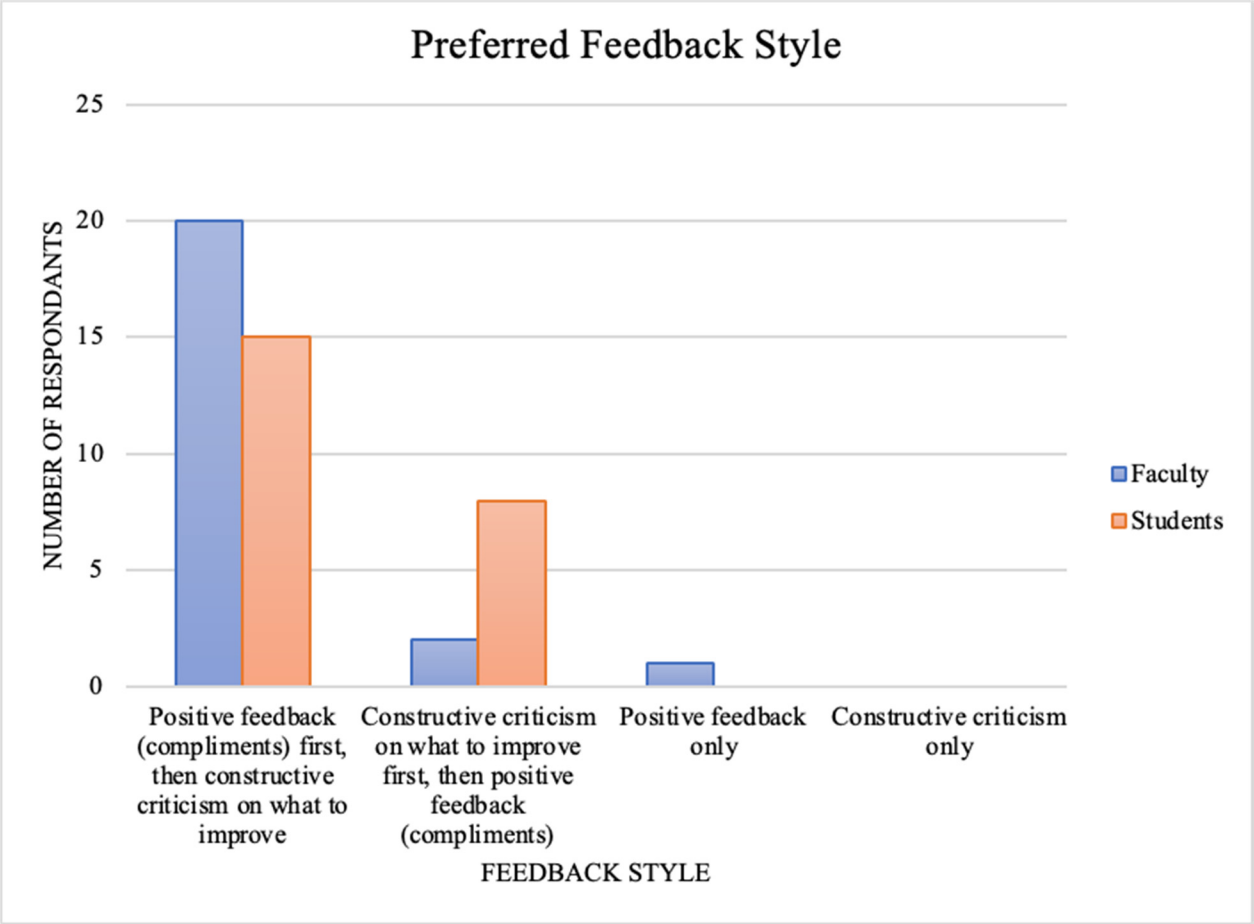

Figure 4. Preferred Feedback Style Reported by Students and Faculty

4. Discussion

Faculty teaching and feedback styles are instrumental in developing the dental student's technical skills. Conversely, student feedback on teaching efficacy can lead to concrete changes in a didactic course (Hajhamid & Somogyi-Ganss, 2021). The purpose of the presented study was to compare faculty and student views on the transition from preclinical didactics to clinical education. To our knowledge, no studies have compared student and faculty views on the implicit aspects of dental education. Particular emphasis was placed on views related to the overall clinical environment, performance in the clinic, interpersonal relationships between faculty and students, feedback styles, and preferred teaching modalities used in clinical education.

The only statistically significant difference between student and faculty responses related to views on interpersonal relationships in the clinic. Specifically, faculty responded more favorably that interpersonal relationships between students and clinical faculty were mutually respected and that effective communication was well-established during the clinic sessions. Given the importance of fostering healthy relationships between students and faculty to encourage a cohesive clinical learning experience, potential explanations for this disparity in views should be further

investigated. Additionally, faculty self-rated their performance as clinical educators higher than students rated the quality of their clinical instruction. Though this difference was not statistically significant, it is possible that the small sample size of the survey failed to capture significant results. As such, any potentially statistically significant differences in faculty versus student viewpoints may remain undetected.

As noted, a significant limitation of the presented study was its small sample size, largely attributed to low response rates. The principal theorized reason for this was survey fatigue due to multiple end-of-year surveys being sent out during the same time. Additionally, one faculty respondent noted in the write-in section of the survey that they were uncertain if the survey pertained to post-doctoral faculty in addition to pre-doctoral faculty. This could have been a source of confusion that potentially led some respondents to self-select out of completing the survey. Another limitation of the survey was the decline in the response rate towards the end of the survey in both the student and faculty surveys. Future survey projects should be designed to minimize the number of questions included and timed to be released as far from other school-wide surveys as possible. Despite the aforementioned limitations, the data gained from this study is useful for academic institutions to reference when determining the best way to train and prepare faculty to work with students.

5. Conclusion

The goal of this study was to compare student and faculty preferences for teaching and learning modalities in the clinical setting, as well as their views on interpersonal professional interactions in the teaching practice. In general, students and faculty responded similarly to questions regarding the transition from preclinical didactics to clinical practice, self-rating performance in the clinic, preferred mode of receiving feedback, consistency of self-assessments, preferred teaching/learning modalities, and optimal characteristics of an effective educator. Notably, the only significant difference in student and educator views was regarding interpersonal interactions in the clinical setting, with students indicating more negative attitudes towards mutual respect, effective communication, and motivation. While the similarities in responses are promising, the main area of disagreement represents an important focal point for future calibration efforts. With dental students reporting higher than average stress levels regarding infection risks and inadequate hand skills entering practice during the COVID-19 pandemic, it is important now more than ever to create a supportive educational environment in which they can rely on instructors for guidance and confidence (Garcia et al., 2022). The consistent use of a survey similar to the one described in this study can be used as a tool to assess areas where clinical instruction can be improved. Indeed, previous studies demonstrated that students prefer feedback-based approaches to judge their performance rather than just grades, but until this survey, the manner of feedback was not established (Sharma et al., 2022).

Moving forward, dental clinical educators can fine tune their practice using surveys calibrated to specific pedagogical areas in need of reinforcement. Part-time faculty tend to outnumber full-time faculty in clinical dental education, yet most part-time faculty lack formal training in educational techniques (Patston et al., 2010). It is imperative that training focused on fostering conductive interpersonal relationships with students is emphasized from the on-boarding process of a part-time or full-time faculty member. The lack of development programs for novice educators may lead to a disconnect between actual student needs compared to their perceived needs by faculty members. For example, surveyed students preferred auditory-based teaching, while faculty ranked this teaching style lower. Using this feedback, educators can better hone their didactic techniques when working with students so educational relationships may be strengthened from the beginning. During unprecedented transitions, such as the move to remote learning during the COVID-19 pandemic, having adequate feedback mechanisms established from the start can limit the stress for students and faculty alike (Garcia et al., 2019).

On an institutional level, the data obtained from this study could be used to reinforce faculty development efforts. Such programs have been shown to increase faculty teaching responsibilities, presentation skills, and professional growth. Perhaps most importantly, a long-term follow-up of faculty members who completed a development program indicated increased faculty retention compared to the national average, offering a potential solution to nationwide staffing shortages (McAndrew et al., 2011). To further address the faculty shortage, there should be more attention given on these surveys to the opinions of younger faculty, in order to encourage a learning environment that is more favored to students and junior faculty (Trotman et al., 2002). Indeed, annual surveys similar to the one described in this study may be used to design an evolving training program for faculty.

Additional research on the differences between teaching and learning styles during the transition from preclinical to clinical settings may further benefit institutions in supporting students and faculty alike. Moreover, studies focused on how feedback styles and preferences may change when teaching is done virtually would benefit programs as they

work to balance hybrid learning styles.

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