

Students' perceptions on dental education in the wake of the COVID-19 pandemic

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1 | PROBLEM

In the wake of the coronavirus disease 2019 (COVID-19) pandemic, dental schools have halted in-person courses and clinical experiences, and instead have migrated didactic education online and restricted hands-on pre-clinical and clinical learning.¹ As some curricular changes may persist after the pandemic subsides, it is critical to understand students' views on the state of dental education.

2 | SOLUTIONS

The aims were to evaluate how the pandemic has affected dental education and how students regard these changes. Student evaluations of their education are considered a useful method of measuring teaching efficacy.² Two surveys (Institutional Review Board [IRB] exempt; Harvard Medical School [HMS] IRB19-1369) were administered to dental students at the Harvard School of Dental Medicine (HSDM) enrolled in online courses during the pandemic; one to second-year students ($n = 32$, response rate = 86%), and another to third- and fourth-year students ($n = 31$, response rate = 47%). The second year at HSDM is primarily preclinical, while the third and fourth years are primarily clinical. By characterizing student opinions, we can improve dental education moving forward.

3 | RESULTS

Students perceived some aspects of their educational experience to be similar to pre-pandemic learning, while other aspects were seen as vastly different. Most felt that their didactic learning had not changed (Figure 1). By contrast, a majority of students felt that preclinical learning had worsened (Figure 1A). In a response question, students noted that a lack of hands-on practice, exhaustion from virtual learning, and general difficulties retaining, visualizing, or understanding material were impacting their preclinical learning (Table 1). Similarly, students felt that clinical learning had worsened (Figure 1B). When asked about the impact to their clinical curriculum, most respondents mentioned that they lacked hands-on, clinical experience, and many suggested that virtual case discussions teach critical thinking but do not replace patient-care experiences (Table 1).

Online clinical-teaching technologies such as virtual patient interactions are commonplace in medicine,^{3,4} and our results indicate that similar tools could benefit dental students. When asked what tools would help facilitate remote learning, second-year students suggested videos of dental procedures, recorded lectures, and exercises to improve hand skills from home. While some third- and fourth-year students proposed more procedural videos and virtual case discussions, most were unsure of a solution. This suggests that, while students in the preclinical curriculum expect to use supplemental tools

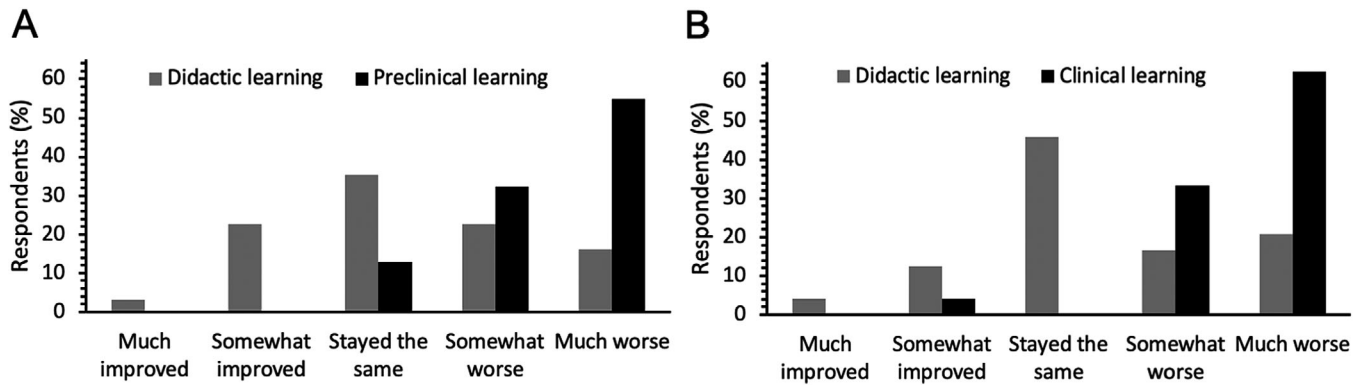


FIGURE 1 A, Responses from second-year students, who were asked how their didactic and preclinical learning has changed since the transition to remote learning due to the COVID-19 pandemic. B, Responses from third- and fourth-year students, who were asked how their didactic and clinical learning has changed since the transition to remote learning due to the COVID-19 pandemic

TABLE 1 Responses from second-year students, who were asked about the impact of the COVID-19 pandemic on their preclinical learning, and from third- and fourth-year students, who were asked about the impact of the pandemic on their clinical learning

Preclinical Learning	
Theme	Representative quotes
Lack of hands-on practice/ access to preclinical lab	<ul style="list-style-type: none"> • “I feel my preclinical education has been severely compromised by the COVID situation.” • “It’s impossible to expect the same effect of learning without the hands-on component.”
Fatigue from online learning/ difficulty focusing	<ul style="list-style-type: none"> • “Staring at a computer screen all day is exhausting and I can’t pay as much attention as usual.”
Difficult to retain, visualize, or understand materials with the current teaching methods	<ul style="list-style-type: none"> • “[It’s] not possible to practice pre-clinical applications of the didactic things that we are learning. This makes for a shallower understanding and lower retention of some of the concepts.” • “Learning hands-on procedures and understanding complex topics requires in-person, face-to-face interaction – any substitution is suboptimal and likely results in frequent misunderstanding, frustration and stress.”
Clinical Learning	
Theme	Representative quotes
Lack of hands-on, clinical experience	<ul style="list-style-type: none"> • “I feel like my clinical learning has greatly diminished. Clinical learning requires hands-on activities, whether with patients or in the lab.” • “Nothing can replace seeing patients, so my education quality has significantly declined.”
Virtual case presentations teach critical thinking but cannot replace hands-on experiences	<ul style="list-style-type: none"> • “It feels like it is at a halt; no technical skills and practice going on, however critical thinking skills are being built via case discussions.” • “I feel like I’m still learning as many concepts as I would be in [the] clinic because of the 4th year case presentations especially.”

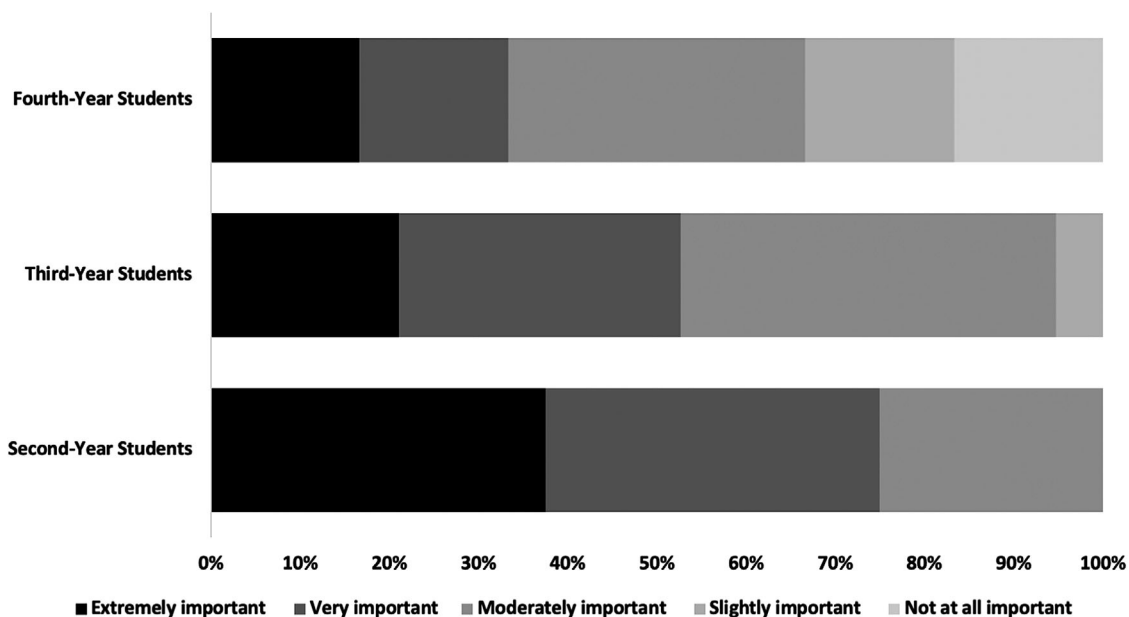


FIGURE 2 Student responses when asked to indicate their perception of the importance of integrating internet-based technology into operative dental education. Students were asked about operative dental education as a representative proxy for assessing preclinical and clinical learning

to continue training, students in clinical training cannot picture a remote substitute. This observation is further corroborated by the degree of interest in the integration of internet-based technology into dental education among students of different class years: the majority of second-year students felt technology integration was important to their operative learning, whereas third- and fourth-year students considered it less important (Figure 2).

Dentistry is unique in that it requires hands-on training. Our survey suggests that online dental education has been vital to the continuation of didactic learning during the pandemic but had limitations in facilitating preclinical and clinical education. Tools such as videos, virtual cases, and recorded lectures may be key to resolving the shortcomings of virtual learning in dentistry^{1,4} and could serve to supplement in-person learning post-pandemic.⁵

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