ORIGINAL ARTICLE

Adapting to Change: Undergraduate Dental Students' Learning Experiences and Perceived Enablers and Barriers During the Post-COVID-19 Transition From Online to Onsite Education

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ABSTRACT

Objective: The present study aimed to explore final-year undergraduate dental students' learning experiences and their perceived enablers and barriers during the post-COVID-19 transitional phase from online to onsite education.

Study Design: A qualitative case study design using focus group discussions was employed in accordance with the Consolidated Guidelines for Reporting Qualitative Research (COREQ) checklist.

Place and Duration of Study: Faculty of Dentistry, Asian Institute of Medicine, Science and Technology (AIMST) University, from April 2022 to June 2023.

Materials and Methods: Homogeneous convenience sampling was used to identify final-year undergraduate dental students currently enrolled at AIMST University Malaysia. Eighteen dental students were recruited and randomly assigned to three groups. They were invited for an online discussion through the recorded Zoom platform. The focus group discussions were audio-recorded and transcribed verbatim. Thematic analysis was performed using an inductive approach.

Results: Three major themes were discovered: (1) Perception of learning facilitating experiences, (2) Perceptions of learning impeding experiences, and (3) Factors influencing learning during transition. The first major theme is divided into five sub-themes: clinical hands-on, treating 'real' patients, knowledge acquisition and understanding, teaching quality, and social interaction. Meanwhile, two sub-themes emerged from the second major theme: expectation and challenging schedule. Finally, the third major theme is divided into six sub-themes: adaptability, confidence and readiness; changes in availability of support; lifestyle; communication; and technical.

Conclusion: Undergraduate final-year dental students reported both facilitating and impeding learning experiences during the COVID-19 transitional period. Dental educators should tailor the current dental education and pedagogical structures to suit the needs and demands of dental students when the country has fully entered the endemic phase.

Key Words: *Dental Student, Health Profession, Online Learning, Post-COVID-19, Undergraduate.*

Introduction

Dentistry is a challenging discipline for students as they are faced with a demanding curriculum, precise skill training, extensive patient interaction, and continuous clinical assessment.[1] This is generally approached through a large devotion of time in patient and instructor-facing environments. However, due to the widespread transmission of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, also known as COVID-19, education systems throughout the world have been pushed to explore alternatives to onsite and face-to-face teaching and learning. Distance learning activities were introduced as a remedy during the pandemic.[2] Consequently, dental students had limited hands-on training exposure. In addition, it is remarkably difficult to simulate dental clinical training through home-based online

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platforms, and a lack of practical training was identified as a serious challenge faced by dental students during their clinical years as a consequence of the COVID-19 pandemic.[3]

Malaysia was largely impacted by the global COVID-19 pandemic, and as a result of the Malaysian government's efforts to mitigate the effects through stringent lockdown regulations, there was a conversion of face-to-face to virtual educational programs, and limited clinical teaching among medical and health science students from April 2020 to mid-2022.[4] In October 2021, the Malaysian government took the initiative to transition the country from a COVID-19 pandemic response to a sustained endemic phase. Following this declaration, higher education institutions were being restored, allowing students to gradually resume physical classes and face-to-face activities from fully online learning. Thus, it becomes imperative to assess and understand undergraduate dental students' perceptions of their learning during the transitional phase after two years of facing pandemic-related challenges. This allows dental educators, curriculum creators, and stakeholders to gain valuable insights that can be used as evidence for future curriculum improvements and ensure readiness for sudden and unexpected changes.

Virtual learning, online learning, or e-learning has evolved as a method to improve the learning process during the outbreak of the COVID-19 pandemic. Although unpleasant, the abrupt shutdown of universities around the world owing to the pandemic provided a massive potential and opportunity for a cultural revolution in higher education.[5] Nevertheless, the shift from face-to-face learning to distance e-learning during the pandemic has proven to change students' learning perceptions as well as the use of educational technology and pedagogy practices.[6] Hence, the transition from pandemic to endemic or post-pandemic phase may be viewed as a critical step in discovering and investing in the learning innovation required to provide the most effective education to our future dentists. To date, studies on the learning perceptions of undergraduate dental students during the transitional period are still scarce in the literature, and no such research has been undertaken among Malaysian dental students. Therefore, the purpose of the present study was to explore undergraduate dental students' learning experiences and perceived enablers and barriers during the post-COVID-19 transition from online to onsite education.

Materials and Methods

An exploratory qualitative case study was carried out at the Asian Institute of Medicine, Science and Technology (AIMST) University from April 2022 to June 2023, in accordance with the Consolidated Guidelines for Reporting Qualitative Research (COREQ) checklist.[7] The ethical approval was obtained from the AIMST University Human Ethics Committee with ethical approval code AUHEC/FOD/2022/04. Both written and verbal consent were obtained from the participants, and all information from the participants was kept confidential and anonymous by the investigators. A focus group approach was used and facilitated by an academic staff member who has prior experience in conducting education-based dental research. Final-year undergraduate dental students currently enrolled in the undergraduate dental program at AIMST University, Malaysia, were included in the present study. Participants were eligible if they had experienced both online learning during the COVID-19 pandemic and the subsequent transition back to onsite training. Students who were on academic leave or who had not resumed onsite learning activities at the time of data collection were excluded.

They were approached via WhatsApp and were invited for an online discussion through the recorded Zoom platform once verbal and written consent was obtained. Students were also informed regarding the purpose of the study. No obligation or dependency was identified between the students and any of the investigators of the present study. Participation was voluntary, and pseudonyms were used to maintain the confidentiality of participants' identities. Sixty-eight final-year undergraduate dental students were invited for the focus group interview, and 18 agreed to participate in the study. These students were divided randomly into three different focus groups, comprising six students per group. Homogeneous focus groups were formed to facilitate open discussion among peers with similar academic exposure, and participants were randomly assigned to groups to minimise potential selection bias.

A topic guide was developed by the research team following a review of the literature on online learning, disruption to clinical education, and student adaptation during the COVID-19 pandemic. The questions were designed to elicit students' learning experiences, perceived challenges, and facilitating factors, and their adaptation during the transition phase from online to onsite education. Content validity was established through internal review by two senior faculty members with prior experience in instrument development and validation, and minor revisions were made to enhance clarity and relevance before data collection. No formal theoretical framework was imposed, allowing for an inductive exploration of participants' perspectives. The validated topic guide was subsequently used to conduct the focus group discussions. Each session began with a brief introduction by the facilitator, followed by an informal conversation to establish rapport and ensure participants were comfortable before proceeding with the guided questions (Appendix 1). The focus group interviews were conducted without any other third-party involvement to safeguard student participants' confidentiality. The discussions were audio-recorded, and the facilitator took the field notes during and after each focus group session. At the time of data collection, teaching and learning were in an active transition phase during the post-COVID-19 period, with a combination of resumed onsite clinical sessions and selected online lectures, requiring students to continuously adapt to changing educational modalities.

Analysis and Findings

Thematic analysis was performed in which the audio recordings were transcribed verbatim and evaluated. Subsequently, the participants received the transcribed manuscripts to cross-check for accuracy. An inductive approach was used to allocate a code to each key sentence and then arrange similar codes into sub-themes, as reported in a previous study.[8] Under a major theme, related sub-themes were grouped together, and these sub-themes were examined again to ensure no missing data. The data were then reviewed by all investigators, followed by contemplation and refinement until a consensus was obtained.

Results

All the investigators agreed that saturation had been reached and that adding more participants to the focus group discussion would not be necessary. Three major themes were discovered and divided into sub-themes, which are listed below with representative quotes from the participants (Figure 1). The following three major themes were: (1) Perception of learning facilitating experiences, (2) Perceptions of learning impeding experiences, and (3) Factors influencing the learning during transition. These themes reflect students' experiences while adapting to resumed onsite learning during the post-COVID-19 transition phase, rather than a completed post-transition state.

Theme 1: Perception of Learning Facilitating Experiences

The positive perceptions of undergraduate final year dental students towards their academic learning during the transitional period can be divided into five sub-themes, including (1) Clinical hands-on; (2) Treating 'real' patients; (3) Knowledge acquisition and understanding; (4) Teaching quality; and (5) Social interaction.

Sub-theme 1: Clinical Hands-On

Students were satisfied with the transition from online back to onsite as they claimed that they could have more hands-on practical sessions, which enhanced their academic learning rather than online classes during the pandemic.

"When we transit back to face to face, we were allowed to practice clinical and lab works, it improves our hands-on practical skills." [P4]

"I learned more (transition period), especially doing more hands-on work." [P8]

"My learning greatly improved. I learnt a lot through face-to-face clinical sessions instead of online lectures." [P9]

Sub-theme 2: Treating 'Real' Patients

Students felt that they learned better on-site as they could observe and treat real patients during the transitional period.

"Onsite learning and look at humans (patients) again, it felt very lively." [P5]

"I felt that our learning is improving because we treat real patients." [P14]

"I started to see real practical cases which is on the benefit side." [P15]

"During the transitional period, we can treat real patients which enhanced our learning." [P16]

Sub-theme 3: Knowledge acquisition and understanding

Students preferred onsite learning because they found it difficult to focus and understand the content delivered during online classes, and they claimed online learning mode was not conducive, which did not help in their learning progress. Students also felt that they could apply and retain their knowledge better during the transition from online to onsite learning.

"I cannot pay attention online. It is not conducive, not helping in my learning progress." [P1]

"I can't focus 100% during online class." [P2]

"Onsite learning tends to retain the knowledge better." [P8]

"I did not learn much and I did not understand what the teachers are trying to teach on Zoom." [P13]

"I would prefer more face-to-face sessions so I can apply the knowledge and brush up my clinical skills." [P17]

Sub-theme 4: Teaching quality

Students felt that the teaching quality was inferior during the COVID-19 pandemic, as the teachers were unable to show them the clinical dental procedures during online lessons, but this gradually improved during the transition to onsite learning.

"Teachers can show us the procedure on patient, and we can clearly see it during the transition phase." [P1]

"Lecturer is able to answer you better face-to-face compared to online." [P8]

"The lecturer never shows us how to do it during the pandemic. During the COVID, we must watch YouTube and learn by ourselves." [P9]

Sub-theme 5: Social interaction

The shift from online to onsite learning was perceived by students as improving their ability to communicate with their teachers and patients, rather than just looking at the screen during online classes and being unable to get their doubts cleared by their teachers via online learning.

"There are less interactions during online class." [P1]

"When we are back to face-to-face session, we get to learn the communication part too." [P2]

"This (transition period) benefits us from our communication skills and also interactions with

people." [P6]

"Face-to-face interaction is better, as we're going to learn how to communicate with people." [P11]

Theme 2: Perceptions of Learning Impeding Experiences

Some students demonstrated negative perceptions of their academic learning during the transitional period, and they preferred their learning to be delivered online mode with the sub-themes that emerged as (1) Expectation and (2) Challenging schedule.

Sub-theme 1: Expectations

Students felt that teachers had high expectations of their academic knowledge and clinical performance during the transition from online back to onsite.

"Our lecturers expect us to know everything in final year and it was a very difficult time." [P8]

"Some lecturers have high expectation on us." [P16]

Sub-theme 2: Challenging schedule

Students felt that their timetable was packed and that they were rushing with their schedule during the transitional period from online to onsite learning.

"The timetable and schedule are too packed, we have brush up all the things in short period." [P2]

"We started our final year very rushed." [P3]

"Tt's a shock to me that there were a lot of things to learn and do when we entered year five clinic." [P4]

"We do not have that much time to practice" [P13]

Theme 3: Factors influencing learning during transition

Students faced several difficulties or challenges during the transitional period from online back to onsite face-to-face learning, with sub-themes that emerged as: (1) Adaptability, (2) Confidence and readiness, (3) Changes in availability of support, (4) Lifestyle, (5) Communication, and (6) Technical.

Sub-theme 1: Adaptability

Students found it difficult as they needed to adapt to the new transition educational system and environment.

"When we started to enter the clinics, it was very difficult for us to adapt." [P8]

"The transition was something very new for me and I find it very difficult to adapt to it." [P14]

"We need to keep adapting ourselves to a whole new system. It's a whole jumbled up." [P17]

Sub-theme 2: Confidence and readiness

Students felt that they were not confident and not

ready as final-year students. Some of them also felt stress with their clinical skills during the transition period, as they had limited practical experience during the COVID-19 pandemic.

"I feel nervous and afraid of what's going to happen next because I lost all my confidence during COVID." [P2]

"We do not have adequate hands-on, and it makes me feel stress and not confident." [P10]

"I feel stress and not ready to transit back to face-to-face." [P13]

Sub-theme 3: Changes in the availability of support

Students felt stressed and depressed as they found it difficult to seek family support during the transition back from online to onsite learning.

"I do not get the support emotionally when I am stressed." [P7]

"It has been depressing for me for the past six months... I need my family here." [P11]

Sub-theme 4: Lifestyle

Students find it challenging to wake up early for physical class sessions, unlike online classes during the COVID-19 pandemic, as they can wake up late.

"That change (from online to onsite) was a little unsatisfied for me, because I had to wake up early for class." [P7]

"The difficulty that I faced is to wake up early for the class." [P12]

"Since we are used to online classes, I feel very tired to wake up early in the morning." [P14]

Sub-theme 5: Communication

Students felt that communication was a challenge for them during the transition from online to onsite learning.

"I felt my communication skill was very bad." [P6]

"I feel stress when I come back because I am not used to meet new people." [P18]

Sub-theme 6: Technical

Students claimed that internet connectivity was an

Figure 1: Themes and sub-themes of the present findings

issue during the transitional period, as some lectures were still conducted online.

"There are always connectivity issues." [P8]

"The main problem is Wi-Fi interruptions or any slow internet connectivity problems." [P11]

"Our lectures that are still conducted online always face internet problems." [P13]

Discussion

The present study explored the perceptions of final-year undergraduate dental students regarding their academic learning during the transition from online to onsite face-to-face learning. The first theme reveals that these students are satisfied with the transitional period because it allows them to engage in more hands-on practical learning during onsite sessions. This aligns with previous research, which also indicates that online classes do not significantly enhance clinical performance in dental education.[9-12] This may be due to the nature of the curriculum in dentistry requiring extensive clinical exposure to master high levels of psychomotor skills.[13] It should also be highlighted that dental training simulations using online manikins are not exclusively feasible as they are highly expensive, difficult to use, hard to get in educational settings, and do not cover all aspects of dental specialties.[14]

Undergraduate dental students in the present study found that their learning experience improved when they could directly observe and treat actual patients. While preclinical didactic case-based exercises or virtual simulations can be effectively delivered online, these teaching methods may not adequately replicate real patient experiences, especially for clinical year students.[12] Moreover, without demonstration on live patients, it might be challenging for students to put the practical applications of the conceptual knowledge they have learnt into practice and correlate them. The absence of essential psychomotor learning opportunities during their final year could have adverse effects, as graduate dentists require substantial exposure to real patients and clinical practice, which were limited on online platforms during the pandemic.[12]

Students in the current study reported improved satisfaction with teaching quality when transitioning from the pandemic's online learning to face-to-face instruction. This can be attributed to the challenges faced by teachers during the COVID-19 outbreak, as
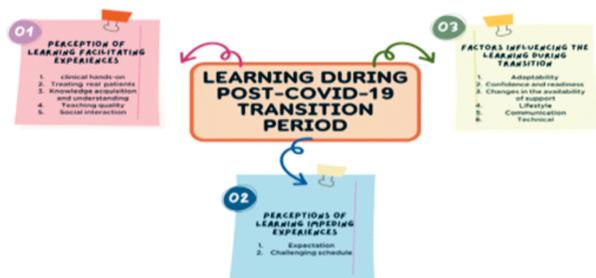
they had to quickly adapt to online or virtual learning technologies and provide comprehensive instruction in dental education through online platforms.[12] Developing effective online learning content was also time-consuming and required proper training.[15] To sustain online or remote learning during the ongoing COVID-19 endemic phase, teachers may need to better organise their lesson plans and make use of readily available teaching resources. In addition, students found that transitioning from online to onsite learning improved their ability to interact with teachers and fellow students. Previous studies indicate that online learning hinders effective communication with teachers and peers.[10, 11] They also highlighted that social networks cannot replace in-person interactions.[10]

On the other hand, students perceived that their teachers had high expectations for their clinical performance and academic success as they transitioned from online to onsite learning. There may be additional factors at play during the COVID-19 transitioning phase, such as stress among teachers, that contribute to the climate of a "high expectations" learning environment. Furthermore, students experienced a packed schedule and rushed during the transition from online to onsite learning. Monitoring the psychological well-being of dental students and faculty members is crucial during this period.[3] It is essential to emphasise strategies for managing a demanding schedule and establish mutual understanding between the dental school and students to ensure the timely completion of clinical requirements and graduation.[16]

In the present study, students encountered challenges in adapting to the new educational system and environment, which is consistent with previous similar studies.[3, 10] Students must figure out how to adjust to the current environment, given the considerable transition from online to onsite learning during the transitional period. Lack of confidence and preparation when transitioning from online to on-site learning is one of the factors influencing learning during transition among final-year undergraduate students in the present study. Therefore, more clinical sessions or simulated practical are needed to reinforce their clinical skills and boost their confidence, and mentoring is crucial during the transitional period. Moreover, students experienced stress and depression as they struggled to seek family support during the transition from online to onsite learning. To support student well-being during the COVID-19 transitional period, dental schools should establish a student support system and implement policies for health-promoting measures.[17]

Undergraduate dental students expressed that their lifestyle has changed ever since teaching and learning have gradually reverted to face-to-face, as they need to wake up early for physical class. Unquestionably, any modifications to the educational system will result in alterations to students' personal lifestyles.[10] This underscores the need for additional counselling and behavioural support during this transitional phase. Moreover, communication challenges have emerged during the transition from online to onsite learning, though it is plausible that dental students' communication skills may improve as they enter their professional careers. Several students also cited internet connectivity issues as a challenge during this transition, a concern supported by previous research.[10, 11] The success of online learning systems relies on high-quality internet access and responsive technical support teams.[18] Hence, educators must consider integrating diverse educational resources and programs that align with contemporary technology within the existing curriculum.[19] Dental schools should seize the opportunity presented by students' pandemic learning experiences to reconfigure their teaching and learning approaches. If dental schools plan to continue offering e-learning or distance education beyond the COVID-19 pandemic, they must contemplate redesigning their pedagogical structures.

One limitation of the current cross-sectional study is its restriction to a single dental school. Students' perceptions may have been influenced by various factors, such as concerns related to the endemic situation, isolation in their homes or hostels, and the time spent with family during the transitional period. The study was conducted during the early stages of the COVID-19 transitional period, when dental students experienced a sudden shift to a new educational setting and new regulations following nearly two years of a national lockdown. As the country's recommendations and guidelines may

change with the nation's progress into the endemic phase, it is advisable to conduct future longitudinal studies.[20] It should encompass both public and private dental schools, along with students from other health professions, to comprehensively assess the general academic learning perceptions during the transition from pandemic to endemic. Nonetheless, the findings from this study can serve as a foundational basis for future research, particularly on a larger sample size covering multiple dental schools in Malaysia.

Conclusion

Within the limitations, the present study has addressed undergraduate final-year dental students' perceptions of their academic learning during the post-COVID-19 transitional period and explored the challenges and concerns they faced when online learning was reverted to face-to-face. Although different students would perceive their academic learning differently, it is imperative for dental educators to investigate this matter and tailor the current dental education and pedagogical structures to suit the needs and demands of dental students when the country has fully entered the endemic phase.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon request.

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