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Experiences and perceptions of New Zealand oral health students' rapid move to online learning

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Abstract

Background and objectives: Moving teaching and learning online due to the onset of the COVID-19 pandemic has been well documented. The impact on clinical healthcare students, however, specifically oral health professions, is not well understood. This study investigated the experiences and perceptions of oral health professional students on the swift and unplanned transition to online learning in the only dental school in New Zealand and the barriers and enablers to better learning experiences.

Methods: A self-administered questionnaire was sent to all BDS, BOH and BDentTech students with 35 ordinal items assessing tutor/teacher factors; student factors; technical factors; and general perceptions of moving to online teaching. Summary statistics were calculated for respondent demographics and each of the items. These were compared between pre-defined groups (age, gender, international student status, ethnicity, and having children) using Kruskal-Wallis tests.

Results: The response rate was 51%. Overall, the shift to online learning was rated as satisfactory (60.1%) and only 15% of students reported they were not satisfied. Online learning experiences differed based on student age, ethnicity, nationality and living situations. Most of the students felt well-connected to, and supported by, their teachers, and their learning benefited from this.

Conclusion: Online learning experiences differed based on demographic and environmental factors. University programmes that predominantly teach face-to-face need to be aware of factors affecting online learning, such as access to space and technology, and ensure support is provided during unexpected events leading to a sudden shift off campus.

Introduction

The COVID-19 pandemic precipitated a global shift to online teaching and learning in early 2020, which also impacted dental schools worldwide (Barabari & Moharamzadeh, 2020; Iyer et al., 2020; Machado et al., 2020). In normal circumstances, online learning can provide an ideal environment for deep learning when it allows the opportunity for critical reflection (Garrison, 2003; Vonderwell, 2003). Other known advantages of online learning include flexibility, providing courses for wider populations and increased availability of teachers through chats and email (Song et al., 2004; Dhawan, 2020). During the COVID-19 pandemic, the unplanned shift to online delivery of course content meant that students could continue their learning when face-to-face classroom style settings were no longer possible (Coman et al., 2020).

Research on online learning undertaken before the COVID-19 pandemic highlights some drawbacks, including a decrease or lack of student motivation, technical issues, and reduced connection between teachers and students (Vonderwell, 2003; Song et al., 2004). Although the opportunity for increased critical reflection is a benefit of online delivery, critical reflection requires finding a balance between the asynchronous online learning environment and ensuring learning communities can exist (Fabriz et al., 2021). The sudden shift to online learning in 2020 meant that academic institutions where teaching was normally delivered through face-to-face interactions had limited time to transition from in-person classroom learning to the online environment. International literature suggests that the required but hurried move to online platforms impacted the ease and effectiveness of teaching and learning over this period, as neither institutions nor students were well prepared (Coman et al., 2020). However, at the time of initiating this study, it was unclear how this impacted clinical students in the oral health professions.

The move from face-to-face learning to online teaching meant that institutions might not have been able to provide an environment that allowed students to engage at a critical reflection level. Instead, they may have been delivering "ready-made intellectual pablum to be accepted and swallowed as if it were something bought at a shop"(Dewey, 1910). In other words, online learning as a consequence of a public health emergency may have encouraged a surface approach to learning, thereby discouraging student engagement and motivation. This change may have impacted the ability of students to self-direct their learning tasks and assessments (Jansen et al., 2017), ultimately impacting their academic achievement.

Students, institutions and teachers have faced many challenges with the shift to online learning and teaching due to the COVID-19 global pandemic (Godber & Atkins, 2021). For example, students experienced technical and digital issues, stress from spending long hours in front of screens, conflicting responsibilities when managing families while studying, and a lack of motivation and connectedness (Subedi et al., 2020). Students have also reported that online learning is less effective than face-to-face teaching (Avramova et al., 2021). Institutions have faced challenges with providing suitable equipment so staff could teach from home, training staff on information technology, strengthening online platform

services and supporting teams to prepare lectures and adopt teaching styles ideal for the online teaching environment. Staff have struggled with poor internet access, inadequate devices and a lack of skills and knowledge of how to use online learning platforms and tools (Subedi et al., 2020).

This study was conducted at the University of Otago Faculty of Dentistry in New Zealand, the only Dental School in the country. New Zealand went into a complete and hard lockdown on 23 March 2020 (Baker et al., 2020), suspending all face-to-face education activities. In healthcare education, there is the added complexity of clinical work, where students and staff have direct contact with patients. Patients can be carriers of contagious infections and, dentistry in particular has high health risks from air-borne viruses such as SARS-CoV-2. This is because most dental procedures generate aerosols and splatter containing body fluids and microorganisms and require the handling of sharp instruments; both are known infectious transmission risks (Peng et al., 2020; Loch et al., 2021). Consequently, clinical learning was suspended over the lockdown period, and teaching and learning focused on the theoretical aspects of dentistry. Although previous research has documented the impact of moving teaching and learning online (Sit et al., 2005), the impact of this move on clinical healthcare students, specifically in the oral health professions, is not well documented. This research examined oral health professional students' experiences and perceptions of the shift to on the swift and unplanned transition to online learning. The study investigated the students' experiences with online learning with respect students, teachers, technical, and other factors.

Methods

Following ethical approval (University of Otago Human Ethics Committee Reference number: D20/098) a questionnaire was distributed to all University of Otago students studying for a Bachelor of Dental Surgery (BDS), a Bachelor of Dental Technology (BDentTech) or a Bachelor of Oral Health (BOH) degree. The questionnaire was distributed at the end of April 2020, when students had already been learning online for more than a month. An information sheet was provided at the beginning of the questionnaire and completing the survey implied consent.

The self-administered questionnaire contained four components: tutor/teacher factors; student factors; technical aspects; and general perceptions of the online teaching move. The questionnaire was self-administered and hosted on the Qualtrics platform. It comprised sociodemographic questions such as gender, student status (international/domestic), self-reported ethnicity, living and family status. This was followed by four sections examining participants' perceptions of the following: tutor/teacher factors; student factors; technical aspects; and general perceptions of the online teaching move, comprising 35 ordinal items. For 34 of these items, students were asked to respond using five choices ranging from (1) strongly agree to (5) strongly disagree. The last item asked their satisfaction with the shift to online learning, with five options ranging from extremely satisfied to extremely dissatisfied. Respondents were invited to provide free-text responses detailing their experiences with online learning. A link to the online questionnaire containing an information sheet was sent to students by email via the learning management system. Three reminder emails were sent at one-week intervals, and the survey remained open for one month. Participants were required to click on a consent tab before they could complete the survey. The survey was anonymous, and no identifying details were collected. All current Faculty of Dentistry undergraduate students (n=531) were invited to participate, and the survey was set to prevent multiple submissions from a single respondent.

No formal sample size calculations were performed given that the entire undergraduate population of the dental school were invited to participate. Statistical analyses were conducted using Stata 17.0 (Stata statistical software, Release 17, StataCorp LLC, College Station, TX, USA) (StataCorp., 2021). After checking and cleaning the data, summary statistics were calculated for respondent demographics and each of the ordinal items. The ordinal items were then compared between pre-defined groups, as shown in Table 1, and analysed using Kruskal-Wallis tests with $p<0.05$ considered statistically significant. No adjustments were conducted for multiplicity given the exploratory nature of the research, and marginal or inconsistent results should be interpreted accordingly.

Results

A total of 382 students responded, giving an overall response rate of 72%. Two students indicated that they did not want their responses analysed, leaving 380. Only surveys with a completion rate of 80% or above for the 35 ordinal items (i.e., they needed to answer at least 28 items) and with at least one of the demographic questions of interest answered were included in the final analysis; consequently, 273 surveys were analysed (51% of those invited).

If analysed by programme of study, 48% of BDS students, 57% of BOH and 60% of BDentTech students participated in the survey, which amounts to almost half or more than half of students from each undergraduate programme. These and other demographic details are shown in Table 1. The survey sample is representative of the entire population; it was dominated by females, students aged 20-24 years, students of Asian (56.3%) and European (28.4%) ethnicities and respondents were primarily domestic rather than international students.

When asked how satisfied they were with online learning, 60% of participants responded they were satisfied or extremely satisfied (Table 2). A further 25% were neither satisfied nor dissatisfied, with only 15% dissatisfied or extremely dissatisfied. About a third (36%) of participants thought that staff were well prepared to move to online teaching, with a slightly higher percentage (41%) disagreeing with this statement. Most students agreed that class time was used effectively (68% responded positively). More than half (53%) thought

that the quality of lectures did not change after they moved online, and most participants (86%) thought that staff worked hard to facilitate the online delivery of courses. Almost half of the students (49%) reported that their online classes were longer in duration than regular classroom lectures.

More than half of respondents (59%) agreed or strongly agreed that they had enough opportunity to interact with their tutors privately during online learning, and 86% of students agreed or strongly agreed that they were able to ask questions in or about the lectures and tutorials. Most students (69%) agreed or strongly agreed that there were more distractions in online lectures than in the face-to-face setting, and 52% indicated that they were less focused in online classes (Table 2).

Most respondents (75%) either agreed or strongly agreed that studying online provided greater flexibility than face-to-face classes. In addition, 52% of students agreed or strongly agreed that online lectures were easier to join on time. However, 28% of students reported issues with internet connection, and 16% reported other IT issues such as software or device problems. Of these, only 2% reported not having an appropriate device and 9% reported sharing a device with another household member. Further, 20% of students had difficulty attending online classes due to personal or family commitments.

Comparisons by demographic characteristics

Gender: Views on whether Zoom lectures were scheduled effectively between genders, with male participants expressing less agreement (mean=3.4), than their female counterparts and this result was significant ($p<0.05$). Male students (mean=2.5) were more focused in online lectures than in conventional classrooms than female students (mean=2.7). However, this result was not significant (Table 3).

Age: Agreement that online lectures were longer in duration varied by age ($p=0.019$) with the lowest agreement among those aged 25 or more (mean 3.1), compared to those aged less than 20 (mean=3.5) or 20–24 (mean =3.6). Agreement that they had to share a computer also varied by age ($p=0.007$), with higher mean agreement among those aged 25 or more (mean 2.1) compared to those aged less than 20 (mean=1.7) or 20–24 (mean=1.6) (Table 4).

Agreement that online lectures held less distraction ($p<0.001$) varied by ethnicity with the lowest agreement among Māori (1.5), Middle Eastern/Latin American/African and Pacific Islander (both 1.8) compared to Asian (mean=2.5) and NZ European students (mean=2.1). Similarly, among Māori (2.1), Pacific Islander (mean=1.8) and Middle Eastern/Latin American/African students (2.1), there was less agreement that online sessions enabled increased focus compared to Asian (mean=2.9) and NZ European (mean =2.4) students (overall $p<0.001$). Asian and NZ European students agreed least (both 2.4) that their everyday commitments had affected their availability for online sessions compared to Middle Eastern/Latin American/African (mean=2.9), Māori (mean =3.0), and Pacific Islander (mean =3.4) students (overall $p=0.007$) (Table 5).

Table 1. Demographic details

	Sample	
	n	%
Gender		
Female	206	75.7
Male	66	24.3
Missing	1	
Age		
<20	46	16.8
20-24	177	64.8
25+	50	18.3
Missing	0	
Ethnicity		
Asian	151	56.3
Middle Eastern/Latin American/African	12	4.5
Māori	17	6.3
European	76	28.4
Pacific Peoples	12	4.5
Missing	5	
Student status		
Domestic	207	76.1
International	65	23.9
Missing	1	
Degree		
BDentTech	27	9.9
BDS	174	63.7
BOH	72	26.4
Missing	0	
Children		
No children	259	96.3
Children	10	3.7
Missing	4	
Living arrangements		
By myself	12	4.5
With parents or caregivers	93	34.6
With others (not parents/guardians/partner)	164	61.0
Missing	4	

Enrolment status: There was more agreement among domestic students (4.0) that they were more distracted during online sessions than among international students (mean=3.4, $p=0.009$) (Table 6). Domestic students also showed less agreement that they were more focused in online sessions compared with face-to-face lectures (2.5 versus 3.1, $p=0.002$) and agreed less that joining online sessions was easier than joining classroom sessions (3.3 versus 3.7, $p=0.005$). When asked about having an appropriate space to join online sessions, international students (mean=3.8) agreed more with this statement than domestic students (mean=3.2, $p=0.003$).

Table 2. Summary of response to survey questions on students experience and perspectives.

	Strongly Agree n (μ)	Agree n (μ)	Neither agree nor disagree n (μ)	Disagree n (μ)	Strongly disagree n (μ)
Tutors/Lectures/management factors					
The Faculty was well prepared for the move to online course delivery	12 (4.4)	86 (31.5)	63 (23.1)	78 (28.6)	34 (12.5)
Scheduled class time/Zoom time has been used effectively	32 (11.8)	156 (57.1)	46 (16.8)	32 (11.7)	7 (2.6)
The online delivery of my course is well organised	22 (8.1)	118 (43.2)	69 (25.3)	52 (19.0)	12 (4.4)
I believe that the quality of the lectures/tutorials did not change with the move to online delivery	37 (13.6)	108 (39.6)	51 (18.7)	46 (16.8)	31 (11.4)
Faculty staff are doing their best to facilitate the online delivery of material	107 (39.2)	128 (46.9)	23 (8.4)	10 (3.7)	5 (1.8)
The online sessions are longer than usual classroom lectures	52 (19.0)	83 (30.4)	85 (31.1)	44 (16.1)	9 (3.3)
The online sessions are shorter than usual classroom lectures	3 (1.1)	22 (8.1)	104 (38.1)	101 (37.0)	43 (15.8)
The online lectures/tutorials or Zoom sessions are accompanied by handouts or written material	38 (13.9)	134 (49.1)	47 (17.2)	41 (15.0)	13 (4.8)
Student factors					
I have enough opportunity to interact privately with tutors, if needed	42 (15.4)	119 (43.6)	61 (22.3)	33 (12.1)	18 (6.6)
I have enough opportunity to interact with my peers	38 (13.9)	116 (42.5)	56 (20.5)	49 (17.9)	14 (5.1)
I am able to ask questions in or about the lectures/tutorials	71 (26.0)	165 (60.4)	25 (9.2)	11 (4.0)	1 (0.4)
I am able to take notes at the same pace as I did in the conventional classroom	66 (24.2)	111 (40.7)	32 (11.7)	44 (16.1)	20 (7.3)
I have more distractions in the online sessions compared to classroom lectures	115 (42.1)	73 (26.7)	34 (12.5)	32 (11.7)	19 (7.0)
I have less distractions in the online sessions compared to classroom lectures	21 (7.7)	26 (9.5)	50 (18.3)	91 (33.3)	85 (31.1)
I am more focused on the online sessions compared to the conventional ones	30 (11.0)	45 (16.5)	57 (20.9)	79 (28.9)	62 (22.7)
I lose interest easily during online lectures compared to conventional lectures/tutorials	58 (21.2)	81 (29.7)	52 (19.0)	56 (20.5)	26 (9.5)
I feel the usual workload for theoretical learning has increased with online teaching	47 (17.2)	85 (31.1)	78 (28.6)	56 (20.5)	7 (2.6)
The number of lectures/tutorials I have attended has increased during the lockdown	19 (7.0)	39 (14.3)	99 (36.3)	86 (31.5)	30 (11.0)
It is easier to join the lectures/tutorials on time when they are online	48 (17.6)	94 (34.4)	69 (25.3)	43 (15.8)	19 (7.0)
Technical factors					
The tutors' audio/video is clear enough in the online sessions	52 (19.0)	152 (55.7)	39 (14.3)	26 (9.5)	4 (1.5)
The questions asked by my classmates are clear enough in the online sessions	54 (19.8)	156 (57.1)	46 (16.8)	16 (5.9)	1 (0.4)
I think other students are able to hear me well if I speak	42 (15.4)	157 (57.5)	58 (21.2)	15 (5.5)	1 (0.4)
I have issues with the internet connection where I am staying	18 (6.6)	59 (21.6)	55 (20.1)	86 (31.5)	55 (20.1)
I have issues with IT/computer/software which make it difficult to participate in lectures/tutorials	8 (2.9)	35 (12.8)	41 (15.0)	117 (42.9)	72 (26.4)

Other factors					
I have an appropriate private space to study in my flat/home without any disturbance	52 (19.0)	107 (39.2)	33 (12.1)	47 (17.2)	34 (12.5)
I have an appropriate device that enables me to complete my online work	106 (38.8)	144 (52.7)	17 (6.2)	5 (1.8)	1 (0.4)
Everyday commitments (e.g. looking after my children) have affected my availability to attend live Zoom lectures	17 (6.2)	38 (13.9)	59 (21.6)	103 (37.7)	56 (20.5)
My part-time job is classified as essential work which has affected my learning	3 (1.1)	16 (5.9)	67 (24.5)	79 (28.9)	108 (39.6)
I am sharing my computer/device with someone else in my home	5 (1.8)	20 (7.3)	10 (3.7)	94 (34.4)	144 (52.7)
Perspectives on moving courses online					
I think it was a good decision to move courses online rather than closing the university during the lockdown period	123 (45.1)	87 (31.9)	38 (13.9)	14 (5.1)	11 (4.0)
There is more flexibility studying online compared to regular classrooms	99 (36.3)	107 (39.2)	39 (14.3)	23 (8.4)	5 (1.8)
I think without an opportunity to deliver lectures/tutorials online, the COVID-19 pandemic would have affected my learning/progress this year to a greater extent	150 (54.9)	86 (31.5)	23 (8.4)	13 (4.8)	1 (0.4)
Moving to online teaching has somewhat reduced the disruption caused due to lockdown	74 (27.1)	114 (41.8)	46 (16.8)	30 (11.0)	9 (3.3)
I am anxious that my ability to fulfill my course requirements and pass my assessments this year has been impacted by the lockdown	145 (53.1)	83 (30.4)	27 (9.9)	14 (5.1)	4 (1.5)
	Extremely satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Extremely dissatisfied
Overall satisfaction with the shift to online lectures	28 (10.3)	136 (49.8)	68 (24.9)	33 (12.1)	8 (2.9)

Table 3. Results by gender

	Overall (mean and 25th and 75th percentiles) n=273	female n=206	male n=66	p-value
Tutors/Lectures/management factors				
The Faculty was well prepared for the move to online course delivery	2.9 (2, 4)	2.9 (2, 4)	2.6 (2, 4)	**0.055**
Scheduled class time/Zoom time has been used effectively	3.6 (3, 4)	3.7 (3, 4)	3.4 (3, 4)	**0.011**

Table 4. Results by age

	Overall (mean and 25th and 75th percentiles)	<20	20-24	25+	p-value
I have an appropriate device that enables me to complete my online work	4.3 (4, 5)	4.5 (4, 5)	4.3 (4, 5)	4.1 (4, 5)	**0.013**
I am sharing my computer/device with someone else in my home	1.7 (1, 2)	1.7 (1, 2)	1.6 (1, 2)	2.1 (1, 2)	**0.007**

Table 5. Results by ethnicity

	Overall (mean and 25th and 75th percentiles)	Asian	Middle Eastern/ Latin American/ African	Māori	European	Pacific Peoples	p-value
Student factors							
I have more distractions in the online sessions compared to classroom lectures	3.9 (3, 5)	3.7 (3, 5)	4.3 (4, 5)	4.6 (4, 5)	4.0 (3, 5)	4.3 (4, 5)	**0.008**
I have less distractions in the online sessions compared to classroom lectures	2.3 (1, 3)	2.5 (2, 3)	1.8 (1, 3)	1.5 (1, 2)	2.1 (1, 3)	1.8 (1, 2)	**<0.001**
I am more focused on the online sessions compared to the conventional ones	2.6 (2, 4)	2.9 (2, 4)	2.1 (1, 3)	2.1 (1, 2)	2.4 (1, 3)	1.8 (1, 2)	**<0.001**
I lose interest easily during online lectures compared to conventional lectures/tutorials	3.3 (2, 4)	3.2 (2, 4)	3.3 (2, 5)	3.8 (3, 4)	3.5 (3, 5)	4.3 (4, 5)	**0.014**
It is easier to join the lectures/tutorials on time when they are online	3.4 (3, 4)	3.6 (3, 4)	2.8 (1, 4)	3.0 (2, 4)	3.1 (2, 4)	3.2 (3, 4)	**0.001**
Technical factors							
Everyday commitments (e.g. looking after my children) have affected my availability to attend live zoom lectures	2.5 (2, 3)	2.4 (2, 3)	2.9 (2, 4)	3.0 (2, 4)	2.4 (2, 3)	3.4 (3, 4)	**0.007**
Perspectives on moving courses online							
There is more flexibility studying online compared to regular classrooms	4.0 (4, 5)	4.2 (4, 5)	3.8 (3, 5)	3.5 (3, 4)	3.8 (3, 5)	3.8 (4, 5)	**0.004**

Table 6. Results by domestic/international student status

	Overall (mean and 25th and 75th percentiles)	Domestic	International	p-value
I have more distractions in the online sessions compared to classroom lectures	3.9 (3, 5)	4.0 (3, 5)	3.4 (2, 5)	**0.009**
I have less distractions in the online sessions compared to classroom lectures	2.3 (1, 3)	2.1 (1, 3)	2.8 (2, 4)	**<0.001**
I am more focused on the online sessions compared to the conventional ones	2.6 (2, 4)	2.5 (1, 3)	3.1 (2, 4)	**0.002**
It is easier to join the lectures/tutorials on time when they are online	3.4 (3, 4)	3.3 (2, 4)	3.7 (3, 4)	**0.005**
Other factors				
I have an appropriate private space to study in my flat/home without any disturbance	3.4 (2, 4)	3.2 (2, 4)	3.8 (4, 4)	**0.003**
Perspectives on moving courses online				
I think without an opportunity to deliver lectures/tutorials online, the COVID-19 pandemic would have affected my learning/progress this year to a greater extent	4.4 (4, 5)	4.4 (4, 5)	4.2 (4, 5)	**0.020**

Table 7. Results for students with and without children

	Overall (mean and 25th and 75th percentiles)	Children	No children	p-value
Tutors/Lectures/management factors				
The online sessions are longer than usual classroom lectures	3.5 (3, 4)	3.5 (3, 4)	2.7 (2, 3)	**0.028**
Other factors				
I have an appropriate private space to study in my flat/home without any disturbance	3.4 (2, 4)	3.4 (2, 4)	2.4 (2, 3)	**0.024**
I have an appropriate device that enables me to complete my online work	4.3 (4, 5)	4.3 (4, 5)	3.7 (3, 4)	**0.012**
Everyday commitments (e.g., looking after my children) have affected my availability to attend live Zoom lectures	2.5 (2, 3)	2.4 (2, 3)	3.7 (3, 5)	**0.004**
I am sharing my computer/device with someone else in my home	1.7 (1, 2)	1.6 (1, 2)	3.4 (2, 4)	**<0.001**

Students living with children: Students who lived with children during lockdown agreed that they had issues such as sharing devices with others (3.4 versus 1.6, p<0.001), availability of an appropriate device for online lectures (3.7 versus 4.3, p=0.012) and having a private workspace (2.4 versus 3.4, p=0.024) (Table 7). Students without children agreed more that everyday commitments affected their availability for online lectures (3.7 versus 2.4, p=0.004). Those without children agreed less that online lectures were longer in duration than face-to-face lectures (2.7 versus 3.5, p=0.028).

Discussion

This research investigated student experiences and perceptions of a shift to online learning due to a national public health emergency, and aimed to understand the barriers and enablers to students of suddenly moving from face-to-face to online learning. Results were intended to improve the quality of teaching and learning online, not only during a pandemic situation, but also to improve the quality of distance learning for health sciences students. The four major areas investigated were tutor factors, student factors, technical factors, and other factors (such as part-time work, family and living situations). Finally, student perspectives of, and overall satisfaction with, their online learning experiences were addressed. Overall, the shift to online learning was rated as satisfactory (60.1%), but 15% of students reported they were not satisfied with the process. Espeland and Indrehus (2003) suggested that the level of student satisfaction with learning experiences affects their learning, so evaluating experiences and perspectives is paramount when new teaching modalities are adopted.

A study by Sit et al. (2005) investigated nursing students' perspectives of online learning. Consistent with the current study, they found that flexibility in learning and the ability to join online lectures provided more satisfaction with this teaching modality. Even though the move to online learning was not planned, more than half of participants agreed that the quality of lectures did not change. These results are likely indicative of the effort that staff put into adapting to the sudden and rapid move to online learning, specifically, in ensuring that the content was delivered in a new format. Most students reported they were able to ask further questions after lectures, indicating that staff remained available in the online environment and that this was a positive outcome of online learning.

Reviews on the effect of COVID-19 on teaching and learning suggest that accessibility, affordability, and flexibility were affected both positively and negatively due to moving to online teaching (Murgatrotd, 2020; Pokhrel & Chhetri, 2021). In the current study, most participants were not affected by technical factors. This may have been due to the availability of reliable and stable internet connection in New Zealand, and the enhanced support provided by the Information Technology Service at the university during the transition to online teaching. Wherever possible, students who did not have adequate equipment, and who remained in Dunedin where the main campus of the University is located, were provided with solutions to enable them to complete their academic work. Students who returned to their hometown or overseas countries did not have access to the same level of support, and this is an explanation for some of the variation of experiences.

Most students reported that there was more distraction in online than face-to-face lectures. However, Asian and NZ European students agreed that online sessions held less distraction, and that they were more focussed, when compared to Māori and Pasifika student responses. These results suggest that the ability to be more focused in online lectures may differ among students, and further research is needed to understand and improve the online learning experiences of Māori and Pasifika students. Yeboah and Smith (2016) suggested that factors such as culture and language skills facilitated the academic achievement of minority students in online learning. These authors reiterated the importance of being mindful of cultural differences in an online environment and suggested best pedagogical methods such as catering for all learning styles are important to improve learning.

Another important factor identified in the current study was the difference in online learning experiences of international and domestic students. Chang and Gomes suggested that there are noticeable challenges experienced by international students and that international students digital experiences are diverse (Chang & Gomes, 2020). Even though the current generation of students use digital technology for social media and communication, the lack of use of digital technology for everyday living such as for health and wellbeing, housing, finance, and relationships affects their online learning experiences (Chang & Gomes, 2020). This could be the reason for the less satisfactory experiences of international students in our study. Rather than assuming all students are equally skilled in digital technology, a greater understanding of digital skill levels is needed to improve online learning experiences. Another important finding not previously reported was the lack of private space that some international students experienced while attending online lectures. Although there are no recent data, in 2004 43% of international students studying in New Zealand resided in rental accommodation, sharing with one, two or three other students, and 42% of students resided in homestay accommodation where they lived with another family (Ward & Masgoret, 2004). However, the Faculty of Dentistry is situated in a city in which a higher-than-average proportion of students live in shared situations or studio flats. Even though most students rated their living arrangements as satisfactory, lack of privacy was considered a problem. Due to the high cost of accommodation and homestay situations, international students tend to stay with more housemates compared with domestic students (Ward & Masgoret, 2004). These results are similar to the results of the current study, suggesting that universities could consider providing alternative study spaces for international students to avoid such issues in the future.

Traditionally, distance/online learning has been considered a valuable option for mature students with families, to enable them to participate in academic activities (Pozdnyakova & Pozdnyakov, 2017). However, the current study, carried out during a COVID-19 lockdown period, found some students were sharing space and equipment with their young children or siblings. Students with family/children commitments reported more challenges in access to private space and personal devices. These results are to be expected under an unplanned swift change to online learning conditions when a nation is under strict lockdown. Usual childcare facilities and schools were closed, meaning that students who were parents had the added responsibility of caring for and home-schooling children whilst continuing their own studies. Additionally, children who were learning from home required devices to do their schoolwork and attend classes, and this need may have led to high demands (particularly where there was only one device for the family) and online access within the home. Once lockdown restrictions eased, these factors would not necessarily provide an impact on online learning. In addition, the students surveyed had originally registered for face-to-face learning courses, for which basic study space and device access are available on-site. It is expected that students registering for online courses would be aware of, and have addressed, the space and technology requirements for study before enrolling and not considered that they might need to work from home for an extended period.

Study limitations and strengths

A key weakness of this study was not using a validated questionnaire for this novel setting. We examined individual items as internal consistency did not always support creating factor-level summary scores (alphas were 0.36 to 0.84), and it was challenging to identify the critical factors needing change. A strength of this study was the timing of data collection, when students were experiencing online teaching and learning first-hand, avoiding recall bias from later assessments. Hence, the results reported here will allow dental educators and educational institutions to better prepare for online teaching and learning during future unforeseen learning disruptions to in person teaching.

Lessons learned and future directions

- Already available and well-developed online tools such as Zoom facilitated the move to online learning. Similar to what would be expected in most developed countries, most students surveyed here had adequate internet and devices, reducing the burden for educational institutions (Pokhrel & Chhetri, 2021).
- Even though the lecturers were well prepared to deliver online lectures, longer lectures were not well-received by students. Even though students were at home during the lockdown, respecting the original duration of lectures (around 50 minutes) could have improved the learning experience.
- Lecture times changed during lockdown, on the assumption that all students were at home and available during that period. A considerable number of students reported that the change in lecture time affected their availability to take part in lectures due to work commitments as an essential worker. This could be avoided by collecting data on availability for online lectures prior to timetabling or respecting the original lecture schedule.
- Students with children were affected by the availability of space and devices, which impacted their experience with online learning. This could be improved by surveying their personal situation and providing portable devices or study spaces to those who needed them. Pre-recorded lectures and a weekly catch-up session with lecturers to revise taught concepts would also help.

Conclusion

This study aimed to examine the experiences of oral health professional students in an unexpected shift to online learning during the COVID-19 pandemic. The findings indicate that online learning experiences differed based on their gender, age, ethnicity and living

arrangements. The results provided a direction for enhancing the provision of online learning during the COVID-19 pandemic, as well as to assist institutions to prepare for future unforeseen adoption of online teaching when required. Most importantly, the findings inform ways in which institutions can support students when rapid and unexpected disruptions to teaching and learning occur.

Conflict of Interests

The project was undunded. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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