

Understanding how pharmacy, occupational therapy and nursing-midwifery students utilise lectures as learning opportunities: A mixed methods study informing post-COVID-19 pandemic return to campus

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Abstract

Introduction: Many universities switched to distance learning in response to the Covid-19 pandemic. As universities move to a post-COVID-19 normal, it is important for educators to be aware of what factors influence learners' face-to-face lecture attendance. This study investigated what factors impacted nursing-midwifery, pharmacy and occupational therapy students' pre-COVID-19 lecture attendance.

Methods: Using a positivist mixed-methods approach, third-year nursing-midwifery (n = 350), pharmacy (n = 24) and occupational therapy (n = 42) students completed a survey with quantitative and open-ended questions that asked students about what factors influenced them to attend and not attend face-to-face lectures. T-tests and Spearman correlations were used to analyse the quantitative data. A qualitative inductive approach was used to code the open-ended questions response data into themes.

Results: Occupational therapy and pharmacy students were more positive about the lectures in their programs than nursing-midwifery students. They also valued lecture quality and style more than nursing-midwifery students, who valued a convenient schedule. All three student cohorts valued engaging and enthusiastic lecturers and reported similar reasons for lecture attendance regarding the physical learning environment, other life- and work-related time commitments and the commuting distance to campus.

Conclusions: While there was agreement on many factors affecting lecture attendance across the three student cohorts, occupational therapy and pharmacy students placed more value on lecture style and presentation, whilst nursing-midwifery students placed more importance on when lectures were scheduled. These results have and will inform factors to consider regarding on campus lecture attendance post-COVID-19.

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Introduction

Informal evidence as well as published empirical literature has shown that university lecture attendance in health science programs has declined dramatically over the last 2 decades (Davis et al., 2012). This is concerning because in-class attendance at lectures has been deemed important by academic staff for students' learning and understanding, as lectures are important contexts for providing interaction with peers and opportunities for learners to ask questions, participate in group learning activities, clarify potential misunderstandings and engage in discussions (Büchele, 2021; López-Bonilla & López-Bonilla, 2015). In health professional courses, students' attendance at tutorials, practical skills sessions and face-to-face lectures are a key part of retention, progression, achievement and professional growth and development. It is also critical for learning ethical behaviours and communication skills and, ultimately, for students' employability.

Absenteeism and poor attendance in face-to-face learning opportunities limits health professional students "from accessing relevant information and contact with relevant materials (clinical skills, lectures and practical sessions) necessary for active learning" (Mokhtari et al., 2021, p. 2). There have been concerns that providing recorded lectures for learners to view later would impact their on-campus attendance. It has been reported, however, that only about 10 to 30% of students used lecture recordings as an alternative to attending live lectures, while others used recorded lectures for revision purposes and to assist with completion of assignments (Marchand et al., 2014). It should be noted that this statistic derives from research carried out in the pre-COVID-19 era.

Although some studies have shown a modest effect on academic performance related to attendance (Davis et al., 2012; Doggrell, 2020a; Horton et al., 2012), a meta-analysis has demonstrated that attendance is a strong predictor of academic performance, and mandatory attendance has a positive impact on average university student grades (Credé et al., 2010). In a recent systematic review of the relationship between lecture attendance and academic performance in students enrolled in human bioscience courses, Doggrell (2020b) reported on the association between lecture attendance and academic outcomes from 27 studies across 32 courses. Of these, 24 (75%) courses demonstrated positive academic outcomes. Similar outcomes were found in studies involving allied health and science undergraduate students (72%) and dental and medical postgraduate students (84%) (Doggrell, 2020b).

Similarly, it has been reported that pharmacy students who chose to attend live lectures performed significantly better than those who viewed the recordings (Schnee et al., 2019) and that higher lecture attendance was correlated with better grades (Landin & Pérez, 2015). Attending face-to-face lectures has also been linked with better academic performance in cohorts of medical (Al Shenawi et al., 2021; Deane & Murphy, 2013;

Fang et al., 2019; Selvig et al., 2015; Stegers-Jager et al., 2012), dental (da Silva et al., 2010; Rawlani et al., 2018; Shumway et al., 2018), nursing (Doggrell, 2021; Mackintosh-Franklin, 2018; Salamonson et al., 2009), psychology (Thatcher et al., 2007) and physical therapy students (van Kessel et al., 2018). As summarised by Wongtrakul and Dangprapai (2020) in their study of medical students (n = 639), “Absenteeism was compellingly associated with poorer examination performance among medical students in basic science medical courses. Preclinical medical students should be encouraged to attend live lectures as often as possible” (p. 1523).

Several studies have investigated reasons why students choose to attend and not attend face-to-face lectures (Beovich et al., 2021; Larkin, 2010; Moores et al., 2019; Oldfield et al., 2017, 2019; Sloan et al., 2020; Zachry et al., 2017). Common motivations to attend include lectures being enjoyable, providing a positive learning environment and contributing to the university experience and a sense of belonging within the university setting (Gysbers et al., 2011; Oldfield et al., 2019). Further reported motivations include being able to ask questions and learning where part of the content is emphasised, having an interest in the subject, having a perception that grades will improve with attendance and positive lecturer personality traits (e.g., good communication skills, being friendly and punctual, exhibiting enthusiasm and a sense of humour, positive interactions with students) (Bati et al., 2013; Forsgren et al., 2021).

Reasons why students elect not to attend in-person lectures include lectures clashing with other classes, scheduling/timetabling at inopportune times, prioritising other assessment tasks, illness or fatigue, lack of student motivation, financial hardship, the need to work during university semester/term time and social and family commitments (Bati et al., 2013; Davis et al., 2012; Gysbers et al., 2011; Oldfield et al., 2017; Paisey & Paisey, 2004; Sloan et al., 2020). Further reported impacts on lecture attendance include interpersonal and system factors, such as poor lecturer–student relationships, negative attitudes of lecturers, teaching issues related to poor quality, style and format, problems with the lecture environment, such as overcrowding, poor instructional technology and malfunctioning audio-visual equipment and lack of adequate ventilation (Bati et al., 2013; Moores et al., 2019; Randa, 2020). More recently, a study by Mokhtari et al. (2021) found that students cite generational differences between students and educators as a cause of absenteeism, which mirrors Rawlani et al.’s (2018) finding of “a substantial disconnect between faculty and student perceptions regarding the importance of class attendance” (p. 1).

COVID-19 had widespread ramifications for the delivery of on-campus lectures in the university sector, as the enforced switch to online lectures, delivered either synchronously or recorded for later viewing, became the norm during the pandemic (Bashir et al., 2021). In the “brave new post-COVID-19 return-to-campus normal”, universities are now making decisions about whether to revert to face-to-face lectures or if continuing with online delivery of lectures and educational content is preferable (Croucher & Locke, 2020; Curtin, 2021; OECD, 2020). It is, therefore, timely and important to investigate

why students attend lectures, as the findings will inform the decision-making process regarding the way course content is delivered in the post-COVID-19 classroom. The aim of this study was to investigate what factors affect lecture attendance in nursing-midwifery, occupational therapy and pharmacy students.

Methods

This study utilised a descriptive cross-sectional study design and incorporated a positivist approach mixed-methods survey/questionnaire (paper-based and electronic). Participants of this study were third-year Monash University students from the Bachelor of Pharmacy (Honours), Bachelor of Occupational Therapy (Honours), Bachelor of Nursing and Bachelor of Nursing/Bachelor of Midwifery (Honours) courses.

The anonymous survey took approximately 15 minutes to complete. To maximise recruitment and to access students who attended face-to-face lectures and those who didn't, the survey was available in both online and print format. Students were informed of the study via Moodle posts, lecture announcements and approaches at the end of a lecture from non-teaching staff conducting the study. Hard copies of the survey were distributed to the three student groups by a non-teaching member of staff during compulsory on-campus small group teaching activities. This ensured the effects of potential power relationships and a sense of obligation to contribute were minimised. Students placed completed hard copies of the survey in a designated box in the classroom. The online survey was made available to students via Qualtrics, and the link to the survey was made known to them by an announcement on the learning platform of a third-year unit that students accessed in each of the three courses.

Students were made aware of the voluntary nature of their participation and the de-identification of all data collected. The survey was reviewed by four university educators and two students from each of the three disciplines, and feedback given was used to revise the survey, thus assisting in establishing face validity and utility. The survey contained:

- seven questions collating demographic information
- six questions asking about the number of hours per week for certain lecture attendance-related activities (not reported in this manuscript)
- three questions asking students to rate aspects of lecture satisfaction, quality and effectiveness (on a 0–10 scale, with 10 being the highest rating)
- the Lecture Attendance Scale (LAS) (Bati et al., 2013), consisting of 34 items divided into five subscales (lecturers and lecture presentation, negative external factors, lecture-related negative factors, individual factors, educational environment). Participants rated the LAS items using a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*) and subscales, with higher scores indicating a positive view towards lecture attendance. The LAS's factor structure was established by its authors using principal component analysis and varimax rotation based on response data from a Turkish

group of 663 medical, dental, pharmacy and nursing-midwifery students (Bati et al., 2013). Bati et al. (2013) reported a 5-factor solution, which accounted for 59% of variance and recorded an overall Cronbach's alpha score of 0.85. No information on the internal consistency of the five subscale factors was reported by the authors.

- thirty statements pertaining to factors that may impact/influence students' lecture attendance behaviour (termed lecture attendance behavioural factors, or LABFs) derived from a review of previously published peer-reviewed literature. Examples of the LABF statements included "typical length of one lecture or lecture series being two or more hours", "perceived quality of the lecturer" and "lecture notes available for copying". Participants were asked to rate the LABFs on a 0–10 scale, with 10 being the highest rating, indicating highest impact or influence on decision to not attend a lecture.
- three open-ended questions that asked students to list:
 - features of a lecture that would make them want to attend
 - features of a lecture that would make them less likely to attend
 - reasons beyond a lecture for why they do not attend lectures.

The three open-ended questions were designed to complement the survey's positivist approach and further explore quantitative survey data, whereby an inductive approach was used to code participants' open-ended answers. Data were collected during March/April 2020, which coincided with the start of the COVID-19 pandemic. This study was approved by Monash University Human Research Ethics Committee.

Quantitative data analysis

As the majority of surveys completed were from the nursing and nursing/midwifery cohort, data from occupational therapy and pharmacy cohorts were pooled for statistical analysis and transferability (Bengtsson, 2016). Unpaired *t* tests using GraphPad Prism (Version 8) were used to determine if there were any significant differences between nursing-midwifery students and occupational therapy/pharmacy students combined on all survey items (except for the seven demographic information questions). Spearman's rho correlations were performed to determine if any significant associations existed between the LAS subscales and the top five LABF variables for both the nursing-midwifery cohort and the occupational therapy/pharmacy combined cohort. Spearman's rho correlation coefficients of 0–0.19 were considered very weak, 0.2–0.39 weak, 0.4–0.59 moderate, 0.6–0.79 strong and 0.8–1.0 very strong (<https://www.statstutor.ac.uk/resources/uploaded/spearman.pdf>). Spearman's rho correlation coefficients were calculated using IBM SPSS Statistics Version 26 (IBM Corp., 2019).

Qualitative data analysis

An inductive approach was used to code the qualitative data from the three open-ended questions (Braun & Clarke, 2006). Written responses to the three open-ended questions

were transcribed into Google Sheets. Four investigators performed a content analysis that involved an initial reading of the responses to decontextualise the data (Bengtsson, 2016). Words that were frequently present in the participants' answers were identified, and similar words, phrases and synonyms were grouped together. This re-contextualisation resulted in codes describing the content, which were used to develop categories. Then, similar categories were grouped, leading to the development of the main themes (Bengtsson, 2016). The inductive approach involved four investigators independently categorising the qualitative data without attempting to match any assumptions to themes, thereby ensuring the credibility of data. To enhance data dependability, the four investigators met multiple times to discuss and compare the themes generated, address and resolve discrepancies and to categorise final themes (Erlingsson & Brysiewicz, 2017). The final themes were compiled, and the most common subthemes identified (Bengtsson, 2016), enabling transferability and confirmability of the results and promoting trustworthiness in the process.

Table 1

Participants' Demographic Information (n = 416)

		Number	Percentage (%)
Enrolment status	Full-time	384	92.3
	Part-time	27	6.5
	Other	5	1.2
Course	Bachelor of Nursing-Midwifery	350 (85% of cohort)	84.1
	Bachelor of Occupational Therapy (Honours)	42 (40% of cohort)	10.1
	Bachelor of Pharmacy (Honours)	24 (11% of the cohort)	5.8
Age (years)	15–19	93	22.4
	20–24	264	63.5
	25–29	31	7.5
	30–34	15	3.6
	35–39	3	0.7
	40 years or older	10	2.4
Gender	Female	350	84.1
	Male	64	14.9
	Prefer not to say	3	0.7
Is English your first spoken and written language?	Yes	260	62.5
	No	156	37.5
Enrolment status	International student	133	32.0
	Domestic student	283	68.0

Results

Participant data

A total of 416 surveys were collected (Table 1). The majority of participants were nursing-midwifery students ($n = 350$ out of 402 students; 87% response rate), followed by occupational therapy ($n = 42$ out of 110 students; 38.2% response rate) and pharmacy students ($n = 24$ out of 238 students; 10.1% response rate). Most students were enrolled full time (92.3%); the majority of students were in the 20–24 age group (63.5%), were predominantly female (84.1%), had English as their first language (62.5%) and were enrolled as domestic students (68%).

Quantitative results

Lecture Attendance Scale (LAS) subscales

On the LAS subscales, occupational therapy/pharmacy students rated the subscales “lecturers and lecture presentation” ($p < 0.0001$) and “individual factors” ($p = 0.0012$) higher than nursing-midwifery students (Table 2). This infers that these subscales were more important to occupational therapy/pharmacy students than nursing-midwifery students when deciding to attend lectures.

Table 2

Test of Difference Results on the Lecture Attendance Scale (Bati et al., 2013) Subscale Scores Between Nursing-Midwifery Students ($n = 350$) and Combined Sample of Occupational Therapy and Pharmacy Students ($n = 66$)

Lecture Attendance Scale Subscales	Nursing/Midwifery Students	Occupational Therapy/ Pharmacy Students	p-value
	Mean Score & SD	Mean Score & SD	
Lecturers and lecture presentation	46.9 ± 0.6	53.2 ± 1.3	< 0.0001**
Negative external factors	42.0 ± 0.5	43.14 ± 1.1	0.35
Lecture-related negative factors	19.2 ± 0.3	20.6 ± 0.8	0.08
Individual factors	28.3 ± 0.4	31.4 ± 0.8	0.0012*
Educational environment	8.7 ± 0.2	8.4 ± 0.4	0.51

Note: * $p < .001$; ** $p < .0001$.

Lecture attendance behavioural factors (LABFs)

Of the LABFs, nursing-midwifery students rated “number of unit assessment tasks” significantly more important ($p = 0.01$) than pharmacy/occupational therapy students, whilst pharmacy/occupational therapy students rated “perceived quality of the lecture itself” ($p = 0.04$) as significantly more important than nursing-midwifery students (Table 3). The most important LABFs rated by nursing-midwifery students related to the

scheduling of lectures, lecture notes being available on the learning management system and whether the lecture was being recorded. For occupational therapy/pharmacy students, the most important LABFs were the quality of the lecture and lecturer, scheduling of lectures and lecture notes being available on the learning management system (Table 3).

Table 3

Test of Difference Results Between Lecture Attendance Behavioural Factors (LABFs) Impact/Influence Decision Ratings to Attend a Face-to-Face Lecture in Nursing-Midwifery Students (n = 350) and Combined Sample of Occupational Therapy and Pharmacy Students (n = 66)

LABFs**	Nursing-Midwifery Students	Occupational Therapy/Pharmacy Students	p-value
	Mean Score & SD	Mean Score & SD	
1. Typical length of one lecture or lecture series being 2 or more hours	5.9 ± 0.2	6.5 ± 0.4	0.14
2. Having only one lecture and no other learning activities scheduled on that day	7.3 ± 0.2	7.3 ± 0.4	0.99
3. Format the lecture was offered in	5.8 ± 0.1	5.2 ± 0.4	0.38
4. Extra support materials available	6.0 ± 0.2	5.8 ± 0.4	0.71
5. Perceived level of difficulty of the unit itself	6.0 ± 0.2	5.9 ± 0.4	0.72
6. Perceived quality of the lecturer	6.7 ± 0.2	7.3 ± 0.4	0.11
7. Perceived quality of the lecture itself	6.7 ± 0.1	7.4 ± 0.4	0.04*
8. Lecture notes available for copying	6.8 ± 0.2	6.5 ± 0.4	0.58
9. Lecture notes available online from unit Moodle site	7.2 ± 0.2	7.0 ± 0.4	0.73
10. Lecture is live streamed	6.9 ± 0.3	6.8 ± 0.4	0.81
11. Lecture is recorded and released after it has been delivered	7.0 ± 0.2	6.7 ± 0.4	0.45
12. Typical grades received by students completing the unit	5.5 ± 0.2	4.7 ± 0.4	0.19
13. Number of unit assessment tasks	6.6 ± 0.2	5.7 ± 0.4	0.01*
14. Accessibility of public transport available to campus	4.7 ± 0.2	4.7 ± 0.5	0.89
15. Cost of public transport to campus	4.6 ± 0.3	4.2 ± 0.4	0.54
16. Number of credit points assigned to unit	4.9 ± 0.2	4.6 ± 0.4	0.45
17. Cost of parking at university	5.2 ± 0.2	4.5 ± 0.5	0.18
18. Cost of university tuition	4.7 ± 0.2	4.2 ± 0.4	0.28
19. Degree year in which the unit is taken (e.g., first year, second year, third year)	5.0 ± 0.2	4.7 ± 0.4	0.43

LABFs**	Nursing-Midwifery Students	Occupational Therapy/Pharmacy Students	p-value
	Mean Score & SD	Mean Score & SD	
20. Number of prescribed weekly readings for unit	4.9 ± 0.2	4.5 ± 0.4	0.28
21. Unit is compulsory for course (degree)	6.0 ± 0.2	5.4 ± 0.4	0.14
22. There is a gap between lectures for that day	7.8 ± 1.5	6.3 ± 0.4	0.66
23. Lecture format covered in tutorial/other teaching activity	6.1 ± 0.2	6.5 ± 0.4	0.35
24. No lecture support available	5.8 ± 0.2	5.3 ± 0.4	0.21
25. Lecture notes are detailed hence lecture offers little new information	6.7 ± 0.2	6.9 ± 0.4	0.55
26. Lecture follows prescribed book chapters closely	6.0 ± 0.2	6.0 ± 0.4	0.93
27. Lecture is well organised	6.2 ± 0.2	6.6 ± 0.4	0.41
28. Opportunity to ask questions during the lecture	5.6 ± .02	5.2 ± 0.4	0.37
29. Lecturer uses humour during delivery	6.0 ± 0.2	6.3 ± 0.4	0.42
30. Lecturer uses personal experiences during delivery	6.2 ± 0.2	6.5 ± 0.4	0.57
31. Lecturer is approachable	6.4 ± 0.2	6.6 ± 0.4	0.68
32. Lecturer is enthusiastic and dynamic	6.6 ± 0.2	6.7 ± 0.4	0.75
33. Lecturer is knowledgeable	6.9 ± 0.2	6.9 ± 0.4	0.88
34. Scheduling of lecture competes with assessment task deadline pressures	7.6 ± 0.1	7.3 ± 0.4	0.46

Note: * $p < .05$; **Impact/influence decision ratings to attend a face-to-face lecture were rated on a scale of 0 to 10, with 0 referring to the least impact/influence and 10 referring to the most impact/influence.

Correlations between nursing-midwifery students' LAS subscales and the five most important LABFs

There was a weak negative correlation between four of the five most important LABFs and the factors that influenced nursing-midwifery students' decisions to attend face-to-face lectures. These included "lecturers and lecture presentations" being negatively correlated with Items 9 (lecture notes available online from unit Moodle site), 10 (lecture is live streamed) and 11 (lecture is recorded and released after it has been delivered) (-0.2). "Negative factors related to the lectures" was negatively correlated with Items 9 (lecture notes available online from unit Moodle site), 10 (lecture is live streamed), 11 (lecture is recorded and released after it has been delivered) and 22 (there is a gap between lectures for that day) (-0.2). "Individual factors" was negatively correlated with Items 10 (lecture is live streamed), 11 (lecture is recorded and released after it has been delivered),

22 (there is a gap between lectures for that day) and 34 (scheduling of lecture competes with assessment task deadline pressures) (-0.2). “Education environment” was negatively correlated with Items 9 (lecture notes available online from unit Moodle site) and 11 (lecture is recorded and released after it has been delivered) (-0.2) (Table 4). This indicates that these LABFs negatively affect lecture attendance for nursing-midwifery students.

Table 4

Spearman Correlation Coefficients (rho) Between the Lecture Attendance Scale Subscales and the Five Most Important LABF Impact/Influence Decision Ratings to Attend a Face-To-Face Lecture for Nursing-Midwifery Students (n = 350)

		Lecturers and Lecture Presentations	Negative Factors Not Related to the Lectures	Negative Factors Related to the Lectures	Individual Factors	Education Environment
9. Lecture notes available online from unit Moodle site	rho	-0.2	-0.009	-0.3	-0.1	-0.2
	p-value	< 0.0001****	0.9	< 0.0001****	0.006***	0.001***
10. Lecture is live streamed	rho	-0.2	-0.1	-0.2	-0.2	-0.1
	p-value	< 0.0001****	.02*	< 0.0001****	< 0.0001****	0.011*
11. Lecture is recorded and released after it has been delivered	rho	-0.2	-0.1	-0.2	-0.2	-0.2
	p-value	< 0.0001****	0.1	< 0.0001****	< 0.0001****	.001***
22. There is a gap between lectures for that day	rho	-0.2	-0.1	-0.2	-0.2	-0.1
	p-value	< 0.0001****	0.2	0.001***	< 0.0001****	0.01**
34. Scheduling of lecture competes with assessment task deadline pressures	rho	-0.1	-0.1	-0.8	-0.2	-0.1
	p-value	0.02*	0.8	0.1	0.001***	0.02*

Note: *p < .05; **p < .01; ***p < .001; ****p < .0001

Correlations between occupational therapy/pharmacy students’ LAS subscales and the five most important LABFs

For occupational therapy/pharmacy students, there was a moderate negative correlation between “lecturers and lecture presentations” and Item 2 (having only one lecture and no other learning activities scheduled on that day) (-0.5) and Item 9 (lecture notes available online from unit Moodle site) (-0.4). There was a weak negative correlation between

“lecturers and lecture presentations” and Item 34 (scheduling of lecture competes with assessment task deadline pressures) (0.3) (Table 5). The results indicate that these LABFs negatively affected lecture attendance for occupational therapy/pharmacy students.

A weak negative correlation was also observed between “negative factors related to the lectures” and Item 2 (-0.3), and a moderate correlation was found with Items 9 (-0.5) and 34 (-0.4). There was a weak negative correlation between “individual factors” and Items 2 (-0.3) and 34 (-0.3) and a moderate correlation with Item 9 (-0.3) (Table 5). A weak negative correlation was found between “education environment” and Item 9 (-0.3).

Table 5

Spearman Correlation Coefficients (rho) Between the Lecture Attendance Scale Subscales and the Five Most Important LABF Impact/Influence Decision Ratings to Attend a Face-To-Face Lecture for a Combined Sample of Occupational Therapy and Pharmacy Students (n = 66)

		Lecturers and Lecture Presentations	Negative Factors Not Related to the Lectures	Negative Factors Related to the Lectures	Individual Factors	Education Environment
2. Having only one lecture and no other learning activities scheduled on that day	rho	-0.5	-0.7	-0.3	-0.3	-0.1
	p-value	<0.0001****	0.596	0.015*	0.016*	0.514
6. Perceived quality of the lecturer	rho	-0.1	0.1	-0.2	-0.2	-1.0
	p-value	0.241	0.328	0.208	0.207	0.446
7. Perceived quality of the lecture itself	rho	-0.1	0.2	-0.1	-0.004	-0.1
	p-value	0.320	0.186	0.421	0.977	0.592
9. Lecture notes available online from unit Moodle site	rho	-0.4	0.5	-0.5	-0.3	-0.3
	p-value	<0.0001****	0.694	<0.0001****	0.037	0.034*
34. Scheduling of lecture competes with assessment task deadline pressures	rho	-0.3	-0.03	-0.4	-0.3	-0.1
	p-value	0.041*	0.811	0.001***	0.006**	0.356

Note: *p < .05; **p < .01; ***p < .001; ****p < .0001

Qualitative results

Qualitative content analysis was undertaken with 1,880 comments obtained from three open-ended survey questions. The analysis derived seven themes regarding reasons for

attending lectures that were either teacher related (lecturer quality and teaching style, lecture content quality and timing and scheduling of lectures), university related (social environment and physical environment) or student related (commitments and travel/transport). For nursing-midwifery students, the most prominent theme underpinning positive reasons for attending lectures was “lecturer quality and teaching style”, followed by “lecture content quality”. The same two themes were identified for occupational therapy/pharmacy students but in reverse order. The two core reasons for not attending lectures were the same for nursing-midwifery and occupational therapy/pharmacy students. For nursing-midwifery students, “timing and schedule of lectures” was the most important reason, and for occupational therapy/pharmacy students “lecture content quality” was the most important (Table 6).

Teacher-related themes

Lecturer quality and teaching style

On “lecturer quality and teaching style”, for both nursing-midwifery and occupational therapy/pharmacy students, the most frequent positive codes were the lecturer being “engaging”, “enthusiastic” and sharing “personal experience”, with slight variance in order of items across disciplines (Table 6). Participants described, “*The lecturer is engaging/approachable*” (occupational therapy student) or “*guest speakers*” (pharmacy student) as being engaging. Enthusiasm was noted, with comments such as, “*Lecturer is enthusiastic about the topic*” (nursing-midwifery student) and observations of “*enthusiasm and interest in teaching by lecturer*” (occupational therapy student). For nursing-midwifery students, the value of a lecturer’s “*personal experience and detailed lecture notes*” (nursing-midwifery student) were noted. Occupational therapy/pharmacy students also described staff being “enthusiastic”, with comments such as “*lecturer is excited about what they’re teaching*” (occupational therapy student) mentioned as a positive reason for lecture attendance.

Negative lecturer quality and teaching style factors were underpinned by participants’ use of the term “unengaging” in comments such as the lecturer “*doesn’t engage with audience*” (pharmacy student), “*lecturer not engaging – reads off slides*” (nursing-midwifery student) or “*slides are just read out word for word*” (nursing-midwifery student). When lecturers read off slides, this connected to a sense that the lecturer “*doesn’t add any new information*” (occupational therapy student).

Lecture content quality

The most frequent positive codes that emerged about lecture content quality were “engaging activities”, “relevant content” and “interesting content”. For nursing-midwifery students, “engaging activities” were noted “*within lecture example: questions*” (nursing-midwifery student), while “relevant content” centred on “*the content is relevant to placement and ... activities/skills we need to know*” (nursing-midwifery student). For occupational therapy/pharmacy students, “relevant content”

connected to lecturers “*following learning outcomes/objectives*” (occupational therapy student) and “*providing extra information with focus on important topics*” (pharmacy student). Both student groups identified importance of “interesting content”, noting the value of “*having examples throughout the lecture*” (nursing-midwifery student and pharmacy student) and being an “*interesting topic*” (occupational therapy student).

Negative elements of “lecture content quality” for both groups centred on content being “available online” – “*being able to watch it in comfort of home*” (occupational therapy student and pharmacy student); “boring” – “*simple slides hence boring and non-engaging*” (nursing-midwifery student) and “*content is boring and not essential for my studies*” (occupational therapy student and pharmacy student); and a sense of receiving “no new information/content” from lecturers – “*repeated info or less info than available resources*” (nursing-midwifery student) and “*no new information*” (occupational therapy student and pharmacy student).

University-related themes

Timing and schedule of lectures

Under timing and schedule of lectures, participants described both positive and negative elements in relation to “convenient/inconvenient schedule”, “lecture duration” and “lecture timing”. A “convenient schedule” was described as having lectures that “*fall on a day with other classes (don't have to travel for just one class)*” (nursing-midwifery student) or “*fits well with other timetabled activities (classes)*” (occupational therapy student and pharmacy student). Descriptions of an “inconvenient schedule” included “*early time slots, only thing (class) that day*” (nursing-midwifery student) and having a “*gap between classes*” (occupational therapy student).

While having gaps in timetables was considered inconvenient by some students, others considered “convenient schedule” important, such as “*having a tutorial or class immediately after*” (pharmacy student). A “convenient schedule” included positive elements such as “*lectures starting around 10 am*” (nursing-midwifery student), while “inconvenient schedule” included lectures being too early “*8 am lecture, peak traffic*” (nursing-midwifery student) and “*too late in the day*” (occupational therapy student and pharmacy student). “Lecture duration” also had positive and negative elements. Positives related to shorter lectures, such as “*1 hour rather than 2*” (nursing-midwifery student) and “*length of time – if the lecture is 1 hour or shorter*” (pharmacy student), while the negatives related to “*long duration heavy content, 2 hours*” (nursing-midwifery student) and “*sometimes lectures are too long and make me feel extremely tired, thus make me have no energy to do other work*” (occupational therapy student).

Social environment

Only negative codes were identified for social environment themes related to lecture attendance: “friends not attending” and “low attendance”. Both participant groups noted “friends not attending”, using descriptions such as “*my friends don’t plan to do*” (nursing-midwifery student) or “*friends do not attend either*” (occupational therapy student) as negatively influencing lecture attendance. Participants were also conscious of the additional pressure they feel in lectures with “low attendance”, with comments such as “*too little people attend – pressure on getting picked by lecturer*” (pharmacy student).

Physical environment

Across the participant groups, only negative codes were identified for physical environment. These included “crowded lecture hall” and “room temperature” for both groups, with nursing-midwifery students also noting an “uncomfortable environment” impacting lecture attendance. Examples of “crowded lecture hall” were comments such as “*small lecture hall – not enough space*” (nursing-midwifery student) and “*uncomfortable, overcrowded lecture hall*” (pharmacy student). For both groups, “room temperature” centred on the “*room temperature – too hot/too cold*” (nursing-midwifery student). Nursing-midwifery students also noted “uncomfortable environment”, such as noise levels: “*annoyed with noise from other students*” (nursing-midwifery student).

Student-related themes

Commitments

Outside of lectures, codes connected to other commitments negatively impacted lecture attendance. For both groups, “assignments” were a key negative influence, with comments such as “*pressure of assignments*” (nursing-midwifery student) and “*I need to complete other assignments*” (occupational therapy student). The negative impact on lecture attendance of “work commitments”, such as lectures “*clash with work*” (occupational therapy student and pharmacy student) and “personal and family commitments”, such as “*family issues*” (occupational therapy student) and “*family responsibilities*” (nursing-midwifery student) were noted by both groups.

Travel/transportation

Travel/transportation was also noted as a negative influence on lecture attendance. For both groups, “travel time” was considered a barrier to lecture attendance: “*transport time about 1–2 hours*” (nursing-midwifery student) and “*not smart to travel 80 mins collectively to sit for 1 or 2 hours to listen at a lecture*” (occupational therapy student). In terms of costs, nursing-midwifery students raised “parking costs” with “*no free parking*” (nursing-midwifery student) as a limiting factor, while occupational therapy/pharmacy students noted “travel costs” such as “*cost of public transport*” (occupational therapy student and pharmacy student).

Table 6*Qualitative Data Analysis Results*

Themes	Participants (Students)	Number of Comments	Positive Comments	Negative Comments
Lecturer quality and teaching style	Nursing-midwifery	369	Engaging Enthusiastic Personal experience	Unengaging Monotone
	Occupational therapy/pharmacy	149	Enthusiastic Engaging	Unengaging Boring
Lecture content quality	Nursing-midwifery	318	Engaging activities	Boring content Available online No new information
	Occupational therapy/pharmacy	108	Relevant content Interesting content	Available online Boring content No new information
Timing and scheduling of lectures	Nursing-midwifery	383	Convenient schedule Lecture duration	Inconvenient schedule Lecture duration
	Occupational therapy/pharmacy	100	Length less than 1 hour Convenient schedule Regular breaks	Lecture duration Inconvenient schedule
Social environment	Nursing-midwifery	20		Friends not attending Low attendance
	Occupational therapy/pharmacy	17		Friends not attending Low attendance
Physical environment	Nursing-midwifery	32		Crowded lecture hall Uncomfortable environment Room temperature
	Occupational therapy/pharmacy	18		Crowded lecture hall Room temperature
Commitments	Nursing-midwifery	190		Assignments Work Personal and family commitments
	Occupational therapy/pharmacy	57		Assignments Work Personal and family commitments
Travel/transport	Nursing-midwifery	93		Travel time Parking costs
	Occupational therapy/pharmacy	26		Travel time Travel costs

Discussion

In this study, we sought to determine what were the most important factors affecting lecture attendance in nursing-midwifery, occupational therapy and pharmacy students before the onset of the COVID-19 pandemic. Responses from occupational therapy and pharmacy students were pooled because of the lower response rates among these two groups.

On the LAS subscales, occupational therapy/pharmacy students rated lecturers and lecture presentation as more important, and within the LABFs section they considered the quality of the lecturer as significantly more important than nursing-midwifery students. For occupational therapy/pharmacy students, “lecture quality and teaching style” was the most prominent theme for not attending lectures, and the qualitative data indicated that occupational therapy/pharmacy students also valued the quality and style of a lecture. As a point of interface between the quantitative and qualitative data, this indicates that for occupational therapy/pharmacy students, quality of lecture is a more important factor when deciding whether to attend a lecture than for nursing-midwifery students. This outcome contrasts with those from Bati et al.’s (2013) study, which reported similar ratings of lectures by pharmacy and nursing students in all the LAS domains, including lecturers and lecture presentation. These differences may be explained by differences in the way in which health science programs are taught, as well as demographic differences between students in the current study and those in Bati et al.’s study.

The negative correlation between “lecturers and lecture presentations” and various LABFs indicated that nursing-midwifery students were less inclined to attend lectures if they had lecture notes available and the lecture was recorded or live streamed. The strongest correlations for occupational therapy/pharmacy students were between “lecturers and lecture presentations” and the LABFs “having only one lecture and no other learning activities scheduled on that day” and “lecture notes available online from unit Moodle site”. This suggests that scheduling of lectures and having notes available were the most important reasons for occupational therapy/pharmacy students not attending a lecture. This is consistent with previous studies citing inconvenient scheduling as a major reason why students do not attend lectures (Davis et al., 2012; Gysbers et al., 2011; Oldfield et al., 2019).

Exploration of another point of interface between the quantitative and qualitative data revealed that both student cohorts valued lecture quality, which is reported to be one of the most frequently cited reasons for non-attendance (Kelly, 2012). Furthermore, having an unenthusiastic lecturer, reading of slides, being boring, “unengaging” or monotonous were traits that dissuaded students from attending lectures. Previous studies have identified personal and subjective factors as determinants of lecture attendance factors, such as the lecturer’s teaching style and lecture content (Bati et al., 2013; Doggrell, 2020b; Kelly, 2012). Contingent with our findings, other studies have also reported

logistical (distance from the university, scheduling of lectures and classes) and personal (illnesses, the lecture environment and use of online resources) factors as reasons for non-attendance (Doggrell, 2020b; Kelly 2012). Bati et al. (2013), however, identified that the significant factor in lecture attendance was individual or external, with illness, lack of sleep, assessments and weather conditions among the highest stated factors in their research. Other factors, such as commitments, assessments and social interaction, have been reported as more significant in previous research (Emahiser et al., 2021; Persky et al., 2014; Yeung et al., 2016).

Limitations and strengths

An acknowledged limitation of the current study is the small sample size of occupational therapy (n = 42) and pharmacy (n = 24) students compared to nursing-midwifery students (n = 350). This necessitated the pooling of the occupational therapy and pharmacy student surveys. With any survey that involves self-report items, there is the potential for respondent bias and social desirability. Additionally, the survey data was collected before the onset of the COVID-19 pandemic in Australia, which caused most lectures to be moved to online platforms. Further studies are required to assess any changes in opinion on lecture attendance, as some factors may cease to be relevant should online delivery of lectures become the norm within tertiary education. For example, students will no longer need to factor in transport time and costs, and the scheduling of timetables could become a less significant issue as lectures can be attended from home.

A strength of this study was the use of mixed methods to generate points of interface, which enabled comparisons between health science students who were less inclined to attend lectures (nursing-midwifery) and students who were more inclined to attend (occupational therapy/pharmacy). The survey included one standardised scale, the Lecture Attendance Scale, which has established reliability and validity (Bati et al., 2013), adding to the rigour of the survey used to collect data. Another strength was the comprehensive nature of the quantitative survey and the coding of over 1,800 student comments, which enabled a thorough analysis of the factors health science students value when deciding to attend face-to-face lectures.

Future research recommendations

We recommend replicating this study with a wider range of health science students from medicine, dentistry, physiotherapy, optometry, social work, podiatry, speech/language pathology and audiology. Tracking of health science students over a longer period from their first year through to their final year is also advocated to generate longitudinal data on students' motivations for attending face-to-face lectures. In addition, further investigation on the traits or characteristics (e.g., personality, emotional intelligence, resilience, professionalism, learning preferences, learning styles) that may predict health science students' lecture attendance is warranted. Finally, a combined comparative study of health professional students' attitudes to lecture attendance pre- and post-COVID-19 is recommended.

Conclusion

This study has provided insights into the factors that impact health science students' lecture attendance and non-attendance/absenteeism, and educators need to be cognisant that lecture attendance is a complex and multi-factorial issue. Numerous factors were found to influence lecture attendance in third-year nursing-midwifery, occupational therapy and pharmacy students. Factors that were relevant to both cohorts included lecture quality, the lecture's physical environment, other commitments and the impact of travel on lecture attendance. Occupational therapy/pharmacy students were more positive about the lectures in their programs than nursing-midwifery students, and they also valued the way a lecture was delivered more than nursing-midwifery students. The facility to view lectures later, or having lecture notes available, was a greater factor for nursing-midwifery students in deciding whether or not to attend lectures. Major factors for all students in terms of determining lecture attendance were the lecturer's ability to engage and exhibit enthusiasm and interest in the lecture topic. These findings, which were based on pre-COVID-19 learning environments, can assist and inform the design and delivery of post-COVID-19 learning experiences for health science students returning to campus.

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