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University students' perceived effort and learning in face-to-face and online classes

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Abstract

For many students today, 'going to uni' requires attending classes, but also juggling work and family commitments. In response to these changing needs, and the increasing importance of digital interaction, most universities now offer blended learning, supplementing face-to-face classes with online learning. The present study examined student perceptions of what they put into, and gain from, blended classes. Third-year psychology undergraduates (n = 130) at an Australian university rated their experience of tutor-directed, face-to-face practical classes, and self-directed, online practical classes, in the one academic unit. In quantitative terms, students reported that they invested similar amounts of effort into the two class modalities, but learned slightly more from face-to-face than online classes. In qualitative terms, students gave contrasting reasons for their perceived learning in the two modalities. They appreciated the classroom experience for the chance to ask questions and revise content, and the online experience for its need for independent thought, although they also missed personal discussion. Responses also showed that different students experienced the two modalities in quite different ways. Judiciously combining in-class and online learning activities, with student choice where possible, seems a relatively efficient way to help enhance the university experience of today's busy students.

Introduction

The university experience, for many of today's students, means more than just living a student lifestyle. As well as attending classes and completing assignments, many students are juggling part-time work commitments, and often caring for their children and/or ageing parents. At the same time, the rapid rise of digital technology has meant that most people's lives are interwoven with online interaction. The distinction between the online and offline world is becoming increasingly blurred (Borland et al., 2019). Australia, where this study was conducted, has some of the highest internet usage in the world. Nearly all (98%) of Australian school students have access to the internet (Australian Bureau of Statistics, 2017; Thomson, 2015), and although similar statistics are not published for tertiary students, the number is likely to be at 100%. Faced with this combination of multi-tasking students and an internet-connected populace, over the past quarter-century there has been a growing trend for universities worldwide to supplement or even replace their face-to-face teaching with online content (Borland et al., 2019; Clark & Post, 2019). Thus, in many institutions, the majority of undergraduates now experience online learning as part of their degree (Tucker et al., 2013). The aim of this study was to examine the perceived effort and perceived learning that students experienced in the face-to-face and online components of blended-learning practical classes, using a combined quantitative/qualitative approach. The results are being used to help improve the student learning experiences in these classes, and a similar approach could be used by other researchers seeking to improve their own classes.

Literature review

Student-centred and teacher-centred approaches

When universities offer online options, these are increasingly attractive to students who are looking for more flexible ways to study (Brown et al., 2018). Being able to complete a degree completely online allows students to more easily integrate their studies with the responsibilities of work and family, but also to organise the timing and location of their studies (Fleck, 2012; Hratinski, 2008). This increased focus on online content delivery is in line with an increased emphasis on a student-centred view of learning. In a student-centred approach, there is more focus on students taking responsibility for their learning, and less on the material to be mastered or the teaching style used (Cannon & Newble, 2000; Gosling, 2006). This contrasts with the more traditional teacher-centred model, in which a teacher transmits information to a largely passive class of students, who provide little input and who all perform the same tasks (Harden & Crosby, 2000; Kember, 1997). However, many commentators have also expressed concern about maintaining the quality of both teaching and learning when the experience is completely online (e.g., Parsons-Pollard et al., 2008).

Face-to-face versus online learning

Numerous individual studies have been designed to compare the relative merits of traditional face-to-face classes with self-directed, online learning, with mixed results. Some researchers have found that interactive online learning results in greater student performance and satisfaction than traditional face-to-face learning (e.g., Zhang, 2005). In contrast, others have observed slightly higher student achievement (e.g., Zacharis, 2010) and satisfaction (but not academic marks, Kemp & Grieve, 2014) in face-to-face groups. However, it seems more common to find no obvious difference in students' achievement or satisfaction levels between online and in-class approaches (e.g., Dell et al., 2010; McFarland & Hamilton, 2006).

Meta-analyses have confirmed that there seems to be no clear advantage to either teaching approach. For example, Bernard et al. (2004) gained mixed results when comparing classes provided face-to-face compared to via distance education (including online). In overall terms, there was virtually no effect of teaching modality on student achievement, attitude, or retention. A meta-analysis by Sitzmann and colleagues (2006) found that classroom and web-based delivery were equally beneficial in terms of student satisfaction and the teaching of procedural knowledge. However, web-based delivery had the advantage for teaching declarative knowledge, especially when students had control over their learning and received feedback when they practised. Finally, a slightly later meta-analysis (Means et al., 2009) revealed that students engaged in online learning performed modestly better than those in face-to-face classes. All three of these research teams concluded that it is not the modality that is so important. Rather, it is the quality and nature of the way that material is provided to students that is crucial, and online learning has the greatest benefits when students actively manage their learning (e.g., Means et al., 2009).

Blended learning

Although the contrast so far has been between purely online and purely face-to-face modalities, many institutions are now adopting an instructional approach known as blended learning, in which face-to-face classes are complemented with online activities (Anthonysamy et al., 2019; Owston, et al., 2013). This approach is designed to be student-centred, self-paced, and flexible (Tang & Chaw, 2016), and has been found to result in better student achievement and satisfaction than learning that is either fully online or fully face-to-face (e.g., Cavanagh, 2011; Dowling et al., 2003). The time in-class provides students with the unique sense of 'being there' and the opportunity for spontaneous interaction and discussion (Osguthorpe & Graham, 2003; Sanders, 2006). The time devoted to working online allows students the time and scope to engage with the material (Skylar, 2009) and develop their responses as well as their cognitive skills (Alexander et al., 2014; Hratinski, 2008).

Unsurprisingly, however, the benefits of blended learning seem to vary with the characteristics of individual students. It appears that those who do best in the online aspect of

blended learning are students who feel engaged in their course, motivated to achieve, and have a strong ability to self-regulate (Owston et al., 2013; Zhu, Au, & Yates, 2016). Without the direct guidance of an instructor, students with low motivation and a generally low record of achievement might find it difficult to organise their own time and efforts to complete the tasks required. Further, students' success in a blended learning course, like any other course, will depend not so much on the modality itself, but on the quality of the teaching materials and delivery. Some instructors may simply transfer their face-to-face teaching materials to an online platform, whereas others may develop innovative ways to create and present online activities in an engaging fashion for students (Holley & Oliver, 2010; Ituma, 2011).

The current study

The present research was conducted in a mid-sized regional Australian university (approximately 35,000 students, 83 per cent domestic, 40 per cent aged over 25 years), in a state with the country's lowest proportion of university graduates, approximately 51 per cent. Teaching at this university is typically face-to-face, but with online resources an integral part of learning (for course content, recordings, resources, assessment submissions, questions for staff). Further, there is a growing requirement to replace many face-to-face classes with self-directed, online activities. This trend is motivated mainly by financial concerns: students who are completing activities in their own time have no need for a paid tutor, and lecturing staff are not paid extra for developing online tasks to replace part of their usual face-to-face teaching. However, the move towards online learning is also part of a worldwide trend in higher education. It assumes that students prefer the flexibility and independence afforded by self-directed activities. As reviewed earlier in this section, there is ample evidence that many students benefit from these positive aspects of online learning. However, the mixed set of results gained from the several meta-analyses in this area (e.g., Means et al., 2009) means that the findings of others' studies cannot be easily generalised to individual classes or courses, especially in terms of students' own perceived experience, rather than simply their academic outcomes. Similarly, conclusions drawn from the current study should be interpreted within its context. The findings might not be reliably generalisable to universities, courses, and cohorts of a different nature, nor beyond the higher education sector, as people have different reasons for engaging in learning within and outside of academic institutions.

The aim of the current study, then, was to assess two aspects of the student experience – perceived effort, and perceived learning – in a third-year undergraduate unit that employed blended learning in its practical class program. The introduction of some self-directed, online practical classes, to replace some of the previous traditional face-to-face classes, came about without student consultation or feedback. The responses gathered here were intended to provide data, from a student perspective, on how the two class types were experienced. Based on the previous literature, no substantial differences were expected between face-to-face and online classes in terms of students' quantitative responses. However, qualitative analysis of open-ended answers was also included to gain a broader picture of the range of reasons that students provided for their responses, and to inform future iterations of this and similar classes. The ultimate goal of this work was thus to use the participants' responses to improve the learning experience of students in this particular educational context, going forward. Further, the method used here could act as a model for other instructors interested in improving the educational experiences and outcomes of their own teaching.

Method

Participants

Participants were 130 third-year developmental psychology students at an Australian university ($\bar{X}$ = 22.4 years, SD = 3.73), nearly all domestic students. There were 102 females, 26 males, and two other, reflecting the common gender imbalance in undergraduate Psychology courses. The participants came from two consecutive-year cohorts (n = 53, n = 77, respectively). However, as the two cohorts did not differ significantly in terms of mean age or gender ratio, and had the same class material and teaching staff, the data were combined for analysis. Students took part as a class requirement, but also provided informed consent for their (anonymous) data to be used beyond the class, as approved by the Tasmanian Social Science Human Research Ethics Committee (Reference No. H0013082).

Procedure

Students completed an anonymous online questionnaire (using Psychstudio, 2019) in self-directed practical class time, in which they answered several questions about their experience and opinions on face-to-face versus self-directed online practical classes. This lifespan developmental psychology unit was taught using a blended learning pedagogy. Weekly lectures were delivered live ($\bar{X}$ = ~30% attendance) and recorded ($\bar{X}$ = ~70% attendance). Of the ten weekly practical classes, seven were delivered face-to-face and three online, with self-directed activities to be completed within a one-week window . The in-class and online learning activities had equivalency in learning opportunities. In both cases, students displayed their understanding through observing, reading, or hearing about an issue and then discussing, writing, or graphically presenting (e.g., through a genogram (family tree) or table) their response. In-class discussion was encouraged, but the online activities did not include a discussion board, in response to previous findings that students did not enjoy or benefit much from online discussion (Kemp & Grieve, 2014).

Participants were asked to respond to four questions that could be analysed quantitively. They were invited to indicate how much effort they normally put into face-to-face and into online practical classes, and how much they felt that they usually learned from face-to-face and from online classes, on a 7-point Likert scale (from 1 = hardly at all to 7 = a large amount). They were also asked to respond why they gave these answers. In terms of perceived effort, participants were

given the choice of four given reasons (own expectations, tutor expectations, peer expectations, engagingness of task) or other. In terms of perceived learning, they were asked to provide their own brief written answer as to why, which was then subject to qualitative analysis.

Results

Figure 1 shows ratings of the amount of effort that students felt they invested, and the amount of learning they thought they gained, from face-to-face versus self-directed practical classes. The differences were slight, but in favour of face-to-face classes. This was confirmed in two paired-samples t-tests: students' perceived effort did not differ significantly between the two class types, t (129) = 1.85, p = .066, Cohen's d = 0.163, but their perceived learning was significantly greater for face-to-face than for self-directed practical classes, t (129) = 3.68, p < .001, Cohen's d = 0.322.

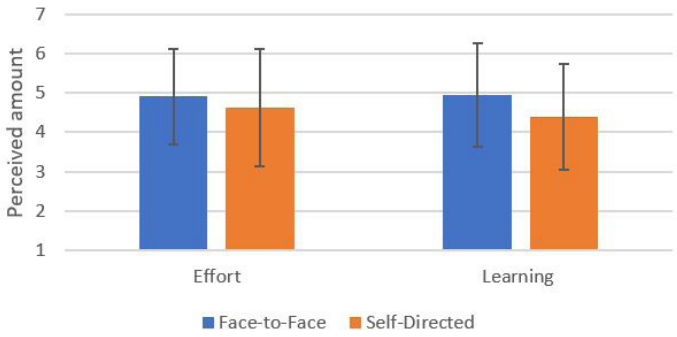

Figure 1. Mean perceived effort and learning for face-to-face versus self-directed practical classes, with standard error bars

Participants' written reasons for their perceived learning were examined at the broad level of whether they were exclusively positive (e.g., "I can work on my own and read through again and again until I actually understand"), exclusively negative (e.g., "less is learned because the option to have discussion and ask questions is not there"), or acknowledged both positive and negative aspects (e.g., "Allows for my own research, but not much opportunity for explanation if I get stuck"). As shown in Table 1, participants were overall more positive in their comments about face-to-face classes, and more negative and mixed in their comments about self-directed classes. A chi-square test showed this difference to be significant , $\chi 2$ (2, 3) = 13.46, p < .001.

Table 1: Number and percentage of positive and negative comments for both class types

Comment type	Face-to-face		Self-directed	
	n	%	*n*	%
Exclusively positive	90	72.6	63	50.0
Exclusively negative	25	20.2	45	35.7
Mix of positive and negative	9	7.3	18	14.3

Participants' reasons for their perceived extent of effort in face-to-face and self-directed practical classes are shown in Table 2. Students chose from four possible options, or selected other. As seen in the table, the responses were remarkably similar between the two class types, and a chi-square test confirmed that there was no significant difference in the pattern of responses , $\chi 2$ (2, 5) = 0.63, p = .96. For both face-to-face and online practical classes, half or more of the students cited their main reason for investing the effort they did was to live up to their expectations, with a further 20 percent or so putting in effort because they felt that the class was engaging. Expectations of tutors and peers were less common reasons for effort in both class types. A few students selected other, with some answers informative (e.g., "I don't like talking in front of people") and some less so (e.g., "I don't know ").

Table 2. Number and percentage of reasons for effort invested in both class types

Reason for effort invested	Face-to-face classes		Self-directed classes	
	n	%	*n*	%
Own expectations	64	50.0	68	52.3
Class is engaging	25	19.5	28	21.5
Tutor expectations	18	14.1	16	12.3
Peer expectations	13	10.2	11	8.5
Other	8	6.3	7	5.3

Participants provided written responses to the question of why they felt they had learned as much as they had learned in the two types of class. Thematic analysis was employed to analyse their responses. The chosen form of thematic analysis was the one explicated in detail by Braun and Clarke (2006), which has become an extremely popular method for analysing qualitative data in a reputable and respected way (Terry et al., 2017). In line with Braun and Clarke's recommendations, six phases were used to identify the themes as they emerged from the analysis. To this end, the author 1) familiarised herself with the data by reading and making notes about the entire list of comments, 2) systematically developed initial codes (each response was allocated to a single code that reflected its core meaning), and 3) collated these codes, and their associated data, into possible themes. The themes were then 4) reviewed and refined until they were satisfactory for the entire dataset, and five) finalised as a complete set, including specific theme names and definitions. The final step, 6), was to produce a narrative about the data, with examples, explained further below.

This qualitative section of the study also satisfied Tracy's (2010) eight criteria for excellent qualitative research. The topic is worthy of research, with its theoretical and practical implications, and the study was conducted ethically and with rich rigour, from the underlying constructs examined to the appropriateness of the data collection and analysis. The author has striven for sincerity in terms of awareness of potential bias, and transparency about the methods and potential limitations of the work. The detail and

description, and the inclusion of example responses from a range of participants contribute to the study's credibility, and an awareness of the extent and the limits of the data's generalisability means the conclusions can be transferred as appropriate, allowing adequate resonance. An important aim has been to achieve coherence across the multiple parts of the study, and ultimately to make a significant contribution to the field.

The careful application of Braun and Clarke's (2006) six phases of thematic analysis yielded two sets of themes (with a small amount of overlap) from the responses about the face-to-face and self-directed practical class activities. The themes are described below, and further below, Table 3 shows the number and percentage of responses (with examples) that were assigned to each theme, for both class types.

Themes from face-to-face classes

In terms of face-to-face classes, six major themes emerged, as well as a handful of other answers, not otherwise classified.

Allow questions and clarifications. Nearly one-third of responses mentioned the benefit of being able to ask questions or seek clarification when explaining the learning they had experienced in face-to-face classes. Students valued the in-class opportunity to gain further information from the tutor as the need arose, often commenting that this improved their understanding of the material.

Revise course content. Equally popular as the theme above, nearly one-third of responses focused on what they saw as the helpful opportunity to go over course content that had been introduced in lectures.

Are engaging. A substantial proportion of students commented that they found the face-to-face practical classes to be engaging, often in comparison to the lectures, or to self-directed classes. Students felt that this greater engagement led to greater understanding of the course material.

Promote discussion. In this theme, students noted that having in-class discussions helped them hear and learn from others' opinions, often improving their own learning.

Cover repetitive content. Some of the smaller themes reflected more negative views of the face-to-face classes, and reasons for expending effort on them. Some participants felt that the revision of material was a nuisance rather than a help.

Cover irrelevant content. Another relatively infrequent and negative set of comments reflected the view that the face-to-face classes covered material that was not relevant to the course.

Other. Finally, a small proportion of responses were too diverse to fit into any of the themes above, or simply unclear.

Themes from online classes

A mainly different set of themes emerged when students explained the reasons for how much they felt they learned during self-directed online practical classes.

Require independent thought. More than a quarter of responses noted that self-directed classes had the benefit of forcing students to come up with their own ideas in response to questions, rather than just listening to their peers or waiting for the tutor to provide an answer.

No chance for discussion. The same number of responses had a negative theme, with students bemoaning the lack of verbal interaction that came with doing practical classes online and alone. Given the positive comments on the discussions facilitated in the face-to-face classes, this is not a surprising finding, but underscores the continued importance of synchronous, real-life discussion for many students.

Are engaging. A smaller proportion of students found that doing the self-directed classes on their own, online, engaged their attention and encouraged them to complete the work, for example, However, as seen further below, another group of participants had the opposite response.

Less pressure. Although there was little mention of the potential stresses of personal interaction, timed tasks, and tutor expectations in the face-to-face practical classes, these concerns were alluded to by responses that noted that the self-directed tasks did not exert so much social/time pressure.

Are not engaging. Another group of students found the self-directed, online nature of these activities to be difficult to interact with. The mixture of comments provided about the self-directed classes suggests that one group of students appreciated the quietness and independence provided by self-directed activities, while the other found it frustrating and unengaging to be working on their own without social interaction.

Cover repetitive content. Another more negative theme, as for face-to-face classes, was that some respondents were unhappy with the coverage of what they perceived as repetitive content.

Can rush through. A similar number of students noted that their (presumably more limited) learning from self-directed classes resulted from the fact that they could get the activities completed in a hurry, without outside scrutiny to check they were being done properly.

Revise course content. A small but more positive theme was that the self-directed classes allowed the revision of some course content. It is interesting that the repetition of content was perceived as a negative experience for some students, and a positive one for others. It would be worth exploring in future research whether these perceptions were related to students' abilities (better students might see the value in revision, or conversely, might become bored more easily with perceived repetition of content).

Puts knowledge into practice. The final theme concerned the applied focus of the self-directed practical classes, commenting on how the activities showed how the lecture material made sense in the real world.

Table 3: Numbers and percentages of responses fitting the themes that emerged about the learning experienced in both class types, with example responses

Theme	*n*	%	Example Response
			Face-to-face classes
Allow questions/ clarification	30	24.2	"Because the tutor makes the pracs interactive, and I am able to ask questions and seek clarification on aspects of the content."
Revise course content	30	24.2	"It's another way to reinforce the information on top of watching lectures and reading notes."
Are engaging	20	16.1	"Because the activities allow us to actively engage in theories/ideas in a way that encourages us to ask questions and be involved [*sic*] in our learning process."
Promote discussion	17	13.7	"Experiencing tasks and discussing with peers helps me to think deeper, and sparks new trains of thought."
Cover repetitive content	12	9.7	"Sometimes the content is similar to lectures' content, gets boring."
Cover irrelevant content	7	5.6	"I feel like the face to face pracs have been informative however sometimes it has felt like we have spent time doing irrelevant tasks."
Other	8	6.4	"Because it's rude not to pay attention in class", "I don't know", "Some of the face to face content seems"
			Self-directed classes
Require independent thought	27	21.4	"Because you are taken from class and asked to work on your own without guidance therefor [*sic*] relying on yourself to learn."
No chance for discussion	19	15.1	"I spend less time on them. I often do the required bits, and then glaze [*sic*] over the rest. There isn't anyone to talk to about your ideas."
Are engaging	17	13.5	"More engaging/interactive – easier to be motivated."
Less pressure	15	11.9	"They allow me to work at my own pace, and Able to focus more, without having to focus on class interactions."
Are not engaging	12	9.5	"I struggle to engage."
Cover repetitive content	11	8.7	"Content was somewhat repetitive from the lecture slides."
Can rush through	10	7.9	"I mostly try to get them out of the way as quickly as possible."
Revise course content	8	6.3	"Goes back over key points and make me revise."
Apply knowledge	7	5.6	"The lecture teaches the information and the pracs apply it."

Discussion

The aim of this study was to examine the extent of, and reasons for, undergraduates' perceived effort and perceived learning in two learning modalities: tutor-directed face-to-face practical classes, and self-directed online practical classes. Previous research has relied largely on the quantitative comparison of student outcomes. This study also included qualitative analysis of student responses, to gain a more detailed understanding of their reasons for (not) preferring each modality. In terms of overall preferences, the differences in between face-to-face and online classes were modest. Specifically, there was no significant difference between class types for perceived effort invested, a small but significant advantage for face-to-face classes in terms of perceived learning, and a significantly greater proportion of exclusively positive comments for face-to-face than online classes. The relatively minor differences observed here are in line with those of decades of previous studies (e.g., Means et al., 2009; Sitzmann et al., 2006), although it is less usual to find an advantage for face-to-face over online learning (e.g., Zacharis, 2010). The main conclusion on the question of modality, then, is consistent with that of many other authors: it is not the modality of teaching that determines student outcomes, but the quality of teaching (e.g., Bernard et al., 2004).

In terms of the effort that students felt they had put into their classes, the reasons chosen were very similar for face-to-face and online learning. In both modalities, students indicated that their effort depended mainly on the expectations that they had of themselves, and the extent to which they found the classes engaging, rather than what anyone else (tutor or peers) thought about their contribution. This pattern of responses is a reassuring one, in that it suggests that most students are engaging in these classes because of their intrinsic self-motivation, rather than simply to fulfil the perceived expectations of others.

However, in terms of the extent to which students thought that they had learned the class material, two rather different sets of reasons were given for how much was learned from each class type. In face-to-face classes, students valued most the chance to ask questions and seek clarifications in class, to go over course content, and the engaging nature of these classes. Together, these three themes accounted for 80% of responses. Unsurprisingly, having access to tutor responses and input is frequently identified as an important determinant of student learning and satisfaction (e.g., Martinez-Caro & Campuzano-Bolarin, 2011; Paechter et al., 2010), regardless of the modality of teaching. In the current study, the fact that so many students found the face-to-face classes engaging might help to explain why the revision of course material was generally seen positively: it provided an interactive and interesting way of revising for later assessment.

In contrast, for online classes, it was most often noted that these self-directed activities had the advantage of obliging students to think for themselves, rather than to rely on others' answers. This was an unanticipated first response, but fits with previous findings that completing tasks online in their own time allows students the scope to consider the tasks more carefully and to develop their responses more thoughtfully (Alexander et al., 2014; Skylar, 2009). The second most common response about learning in an online context was a negative one, focusing on the lack of discussion afforded by the online activities. It is true that by design, these self-directed activities did not include an online discussion component (as discussion was included instead in the face-to-face classes). However, even when students are provided with internet-based discussion forums, this modality is often perceived as inferior (Kemp & Grieve, 2014), and often does not encourage such cohesive or critical points to be made (Bliuc et al., 2011). In the current study, some students enjoyed the perceived lack of time pressure or social pressure from the online

practical classes, feeling that they could work through the activities at their own pace, without judgement from peers or tutors. Previous researchers have also noted this as a benefit of online learning for some students: those who feel apprehensive about joining in face-to-face discussions or answering questions on the spot in front of others, can feel less intimidated when supplying their responses more slowly and thoughtfully online (e.g., Hobbs, 2002; Warshauer, 1997). In contrast, other students in the current study liked being able to "rush through" the self-directed activities and get on to other tasks.

The main impression that emerges from this wide range of themes is that different students engage in, and experience, learning in very different ways, whether that learning is in a classroom or via a computer screen. Some students specifically noted that they found the online classes engaging; others indicated that they found them unengaging. Having the opportunity to revise course content was seen in a positive light (as useful revision) by nearly one-quarter of students in their face-to-face responses about learning, but the type of revision was seen negatively (as a repetitive nuisance) by another 9-10% of students in both the face-to-face and the online responses. Taken together, this pattern of themes in student responses serves as a reminder that it can be quite misleading to draw broad conclusions about what students (dis)like about tutor-directed, face-to-face learning versus self-directed, online learning. It does seem that undergraduates generally benefit from the flexibility afforded by self-directed, online tasks (e.g., Brown et al., 2018; Hratinski, 2008). However, as noted by previous researchers (e.g., Anthonysamy et al., 2020; Owston et al., 2013), those with high levels of self-motivation and self-regulation appear best able to apply themselves and gain the most from these activities.

The findings from this small study are generally consistent with those from much larger studies, as well as meta-analyses. However, their importance lies in the contribution that they can make within their context. Specifically, the perceptions that these students reported about their own learning and effort are now being used by the class co-ordinator to improve the content and structure of these and similar future classes. For example, more focus will go into helping students to understand and learn the material presented in online practical classes, given that students felt they learned slightly less online than face-to-face. It is also important to provide more scope for discussion and for questions in online classes, and to require more students to contribute their ideas in face-to-face classes, to avoid the discussion being dominated by those who are more engaged, knowledgeable, or confident. The present results could also make a contribution beyond a specific set of classes. Asking students for their anonymous responses to these types of simple yet focused questions could help other educators to identify the strengths and weaknesses of their own class structures and teaching. This kind of method could thus serve as a starting point for other educators who are eager to identify students' perceptions about their learning experiences, and to use similar methods to improve their teaching in their particular context.

This study is not without its limitations. One is the imbalance in the level of detail invited from participants in explaining the 'why' of their perceived effort (for which they chose from a set of answers) and of their perceived learning (for which they provided a written response which could then be analysed thematically). It would have been preferable to ask for open-ended responses for both question types, to allow richer analysis of the reasons for students' effort, as well as for their learning. Another limitation is the restricted scope of the questions asked. Future, larger studies would do well also to collect data on individual student characteristics, and their academic performance.

Conclusions and recommendations

The results of this small-scale study are in line with those from decades of previous research: any differences in student experience and outcome between face-to-face and online learning seem to depend more on the quality than the modality of instruction. However, this study also provides insights into some of the reasons why students give to, and gain from, their in-class and on-screen studies. Overall, different students have quite different experiences of the two class modalities: a fast-paced classroom discussion might be perceived by one student as engaging and full of opportunities for gaining new knowledge, but by another student as intimidating and with little scope for developing a thoughtful response. It is not practical to suggest that every university instructor take student-centred learning to the lengths of developing a personalised learning plan for every student, based on their individual work/family commitments and personal characteristics. Nevertheless, a blended learning approach allows instructors to provide students with a range of in-class and online tasks. The current results suggest that giving students some choice about how they complete some task types might provide an efficient way for more students to feel in control of their own learning, and to fit that learning in more easily amongst their other work and family roles.

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