Understanding students' views on the efficacy of video technology to promote engagement in higher education.

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This article examines student engagement with video technology in a large undergraduate university subject. Drawing on a mixed methods study that included a survey and focus groups with students, we analyse students' experiences with and perspectives on the videos to gain insights into their effectiveness in supporting student engagement and learning. By analysing engagement along three distinct, yet interconnected, dimensions – cognitive, behavioural and affective – our study highlights differences in the ways in which students engage with videos as one key form of technology enhanced learning. We find that videos can promote cognitive engagement by helping students to understand key concepts and making them more relatable, and that they can foster affective engagement, especially by creating an increased sense of teacher presence. However, while the students in our study largely perceived the videos to be engaging and beneficial to their learning, behavioural engagement was inconsistent across the cohort and often lacking. Student concerns about investing time in engaging with video resources suggest that communication from educators on their role in the curriculum is especially important. These findings contribute important insights into students' video technology use which in turn can inform the pedagogical use of technology in teaching and learning.

Introduction

In recent years, the use of video technology in higher education has dramatically increased, not least since the onset of the Covid-19 pandemic in 2020. Videos are used in many ways – from entirely replacing lectures to supplementing them in various ways, and with various purposes, either focusing on improving student learning and performance or strengthening student engagement. Despite their popularity, the degree to which video technology is successful in meeting these objectives differs. Research exploring the impact of video technology on academic performance shows mixed results. Some studies report noticeable improvements to academic performance with the incorporation of video content (Choi & Yang, 2011; Nagy, 2018), while others report no significant improvements (Hsin & Cigas, 2013; Henderson & Schroeder, 2021; Draus et al., 2014).

While studies exploring the impact of video technology on student engagement find more positive results, showing improvement in engagement and satisfaction (Hsin & Cigas, 2013; Guo et al., 2014; Bialowas & Steimel, 2019), these benefits tend to be contingent upon the purpose of the videos, design features, and their role in the curriculum. For example, research suggests that video resources are most effective when employed in combination with other teaching methods, including live lectures and tutorials, and integrated into a program of learning, rather than when used in isolation (Hadie et al. 2019; Noetel et al. 2021). Yet, our pedagogical understanding of student engagement with video resources often stems from analytics data and is confined to behavioural engagement. As Kim et al. (2014) observe, the proliferation of predominantly video-based Massive Online Open Courses (MOOCs) dictated the interest in behavioural engagement and established ideas, such as six minutes being the optimum length (Guo, et al., 2014). The universality of these rules is questionable though. For example, Lagerstrom and colleagues (2015) show that in a standard university course students can sustain attention on a video for significantly longer than six minutes, underscoring that students' engagement with video content is multifaced.

What characterises most existing studies on the use of video technology in higher education is that they have been conducted in controlled environments, rather than in what Fyfield et al. call "authentic learning environments" (2019, p.2). 'Authentic' in this setting refers to a situated study within a real learning context as opposed to an experimental study conducted in laboratory conditions. The few existing studies to examine authentic learning environments (for instance Muller et al., 2008; Stiller et al., 2009; Merkt et al., 2011) have contrasted student performance within controlled and authentic environments, focusing on student learning rather than engagement. Yet, the general lack of focus on authentic learning environments means that we know little about students' perceptions of the utility of educational videos. Similarly, while

some insights on students' intentions can be inferred from analytics data, self-reported data on these questions can tell us more about the use of video as part of learning (Largerstrom et al., 2015).

To that end, this paper addresses a gap in the existing research by exploring how undergraduate students experienced a suite of short videos produced to increase both student learning and engagement in an authentic learning environment in a large undergraduate subject. The use of video in teaching and learning can incorporate a range of variations and technologies. In this paper 'video' refers to a series of pre-recorded resources that the students viewed asynchronously, and that were designed to complement the other teaching and learning activities in the subject.

Through a mixed methods design, we explore students' own perceptions of the utility of these videos for their learning and their effect on students' overall engagement with the subject. Engagement is a complex concept to define and measure (Kahu 2013) and is often a vague term in educational settings that is used to refer to different concepts. Drawing upon the educational literature, in this paper we employ a tripartite definition of engagement as being comprised of cognitive, behavioural and affective components (Fredricks et al., 2004; Kahu and Nelson 2018; Bond et al., 2020). Cognitive engagement involves the investment of intellectual processes to learn concepts, behavioural engagement refers to the active participation in learning activities, and affective engagement relates to emotional, relational, and embodied interactions with course content, teachers, and peers. In this paper we interrogate student engagement with the short videos along these three interconnected dimensions. Our analysis examines each dimension separately to highlight distinctions between the ways in which students engage with videos across the different categories and provides insights into how pedagogical and appropriate learning designs can best stimulate such engagement.

Methods

This paper draws on data from a mixed methods study conducted in 2022 that examined how students in a large cohort subject experienced and engaged with a set of short educational videos. The subject is a second-year subject that introduces students to research methods, taught in the Bachelor of Arts degree at a large, Australian university, and it is compulsory for students majoring in Sociology, Criminology and Political Science. In 2022 677 students were enrolled in the subject. The subject is taught using a conventional lecture/tutorial format and taught weekly over a 12-week semester, with additional (optional) activities available in online, weekly modules, including the videos that we focus on in this paper.

The videos were developed to increase student engagement and learning by providing a short and accessible introduction to the topic each week for 9 out of 12 weeks of the semester. The videos sought to take their starting point in an everyday situation or in other ways be relatable for students, to allow them to relate the complex ideas examined in the subject to real-world examples in their own lives. Each video was 3-4 minutes in length, with the exception of one longer (8 min) video and almost all ended with a question for students to consider as they started engaging with that week's content. They were high-quality videos, professionally produced by the University's multimedia team and featuring the subject coordinator as the main presenter in a studio or on campus. They were embedded in the subject's site hosted on Canvas, the Learning Management System (LMS) platform, and intended to be viewed by the students prior to the weekly lectures and tutorials. In some weeks, the videos were actively mentioned and drawn on in the lecture, while in other weeks it was assumed students would watch these videos as they started their weekly preparations. As we return to in the Conclusion, this assumption was wrong and potentially naïve and more detailed instruction around and embedding of the videos were necessary. The classes were delivered in-person in 2022, however, lectures were also livestreamed and recorded for students who could not attend in person, typically due to COVID-19 related concerns. Students could attend tutorials either in-person or online, and in 2022 10 of the 34 tutorials were delivered online. For the majority 2students then, the subject was experienced as a blended or hybrid subject, while for a significant minority (around 150) it was experienced as wholly online.

The study generated quantitative and qualitative data on student engagement with, and experience of, the 9 short videos developed for the subject. The study was approved by the University Human Ethics Committee (Ethics ID 24426). Informed consent was sought from students who were promised confidentiality. To ensure this and address perceived concerns about partiality, the subject coordinator (the second author) was not involved in data collection and only had access to anonymised data. In the analysis we draw on user data from the LMS system, on survey data collected from a survey with 105 students who undertook the

subject in the first half of 2022, and on focus group data from focus groups with 12 students and 4 tutors in the subject. Here we briefly describe each component.

At the end of the semester, all students enrolled in the subject received an email with an invitation to a short survey about their experience of the short videos used in the subject. The survey received 105 responses, a response rate of approximately 15%, which has been found to be a reliable response rate for student surveys in higher education contexts (Fosnacht et al., 2017). The survey questions were designed to gain insights into the students' levels of engagement with both the subject as a whole and the videos, and to interrogate the nature of their engagement in relation to cognitive, behavioural and affective dimensions.

The survey instrument drew on the definitions of the three dimensions of cognitive, behavioural and affective engagement as described by Fredricks at al. (2004) and built upon pre-existing empirical studies that have employed surveys to measure student engagement across these three dimensions ((Al-Obaydi et al., 2023; Ben-Eliyahu et al., 2018; Bowden et al., 2021). To examine behavioural engagement, we focused the survey items on students' involvement with the activity of viewing the videos, including how often they viewed the videos (if at all), and when they watched them (before the lecture, after the lecture or at the end of the subject). To explore perceptions of cognitive engagement, we focused on the impact of the videos on student learning, including responses to the question 'the videos helped me to better understand ideas and materials covered in the subject,' measured on a 5-point Likert scale. For affective engagement, we asked about the extent to which the videos fostered a sense of emotional investment through creating a sense of teacher presence.

At the end of the survey, respondents were asked whether they were interested in participating in a focus group, and all respondents who expressed interest were given the opportunity to participate. A total of 12 students participated in a 45-minute focus group discussion across four focus groups with between two and five students in each group. A fifth focus group was conducted with four tutors who taught in the subject in 2022. All focus groups were moderated by the lead author. The focus group discussions focused on the student and tutors' perceptions of the videos and their role in promoting engagement and reflected on some of the findings from the survey. The sessions with students also involved watching segments from two different videos to allow for a more in-depth discussion of the purpose of the videos and their success in facilitating learning and engagement.

The focus groups were transcribed verbatim and coded in Nvivo using an inductive coding process that allowed key themes to emerge from the transcripts. A thematic analysis was conducted (Braun & Clarke, 2012) to identify key recurring themes and collate key quotes. The themes were then grouped together according to whether they reflected cognitive, behavioural, or affective engagement, or in some cases a lack of engagement along these dimensions.

Findings

Cognitive Engagement

Cognitive engagement relates to investment in learning, as well as to student motivation and the capacity to undertake self-regulated learning (Fredricks et al., 2004). Within this dimension, we explored whether students perceived the videos as engaging, helpful to their understanding the key concepts of the subject and motivating to engage with the other components of the subject.

A small majority (57%; n = 58) of respondents found the weekly videos engaging (Figure 1). However, the responses suggest some discrepancy in perspectives, as 20% (n = 22) of respondents either disagreed or strongly disagreed with this statement, while 24% (n = 24) had a neutral view.
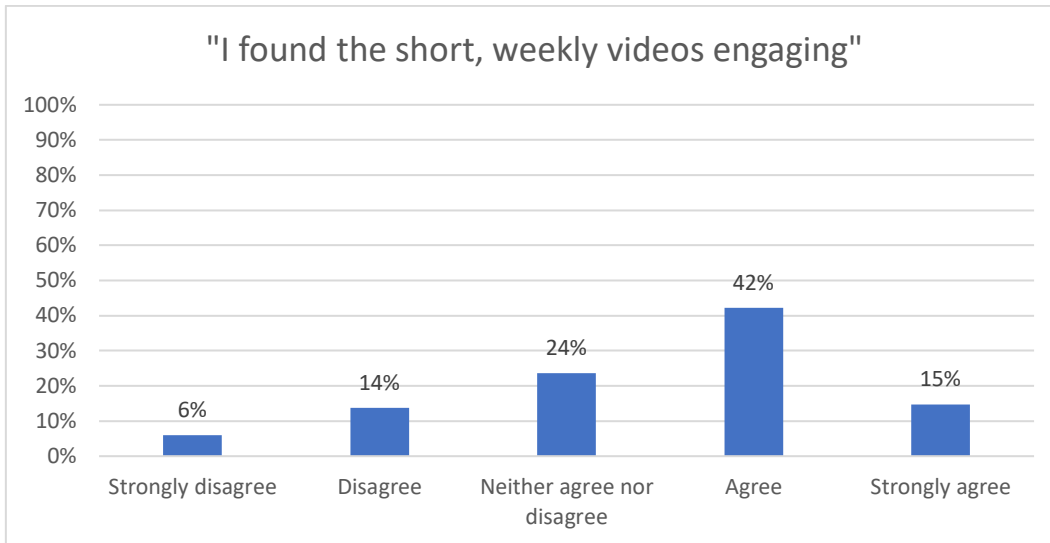
Figure 1. Responses to the question: to what extent do you agree with the statement "I found the short weekly videos engaging"?

When considering these numbers alongside students' overall engagement with the subject, we find a similar distribution across the response options, revealing diverse levels of engagement with the subject itself. 59% (n = 60) of respondents indicated that they agreed or strongly agreed with the statement "I found this subject engaging," while 28% (n = 29) either disagreed or strongly disagreed with this statement, and 13% (n = 13) indicated a neutral response (Figure 2).
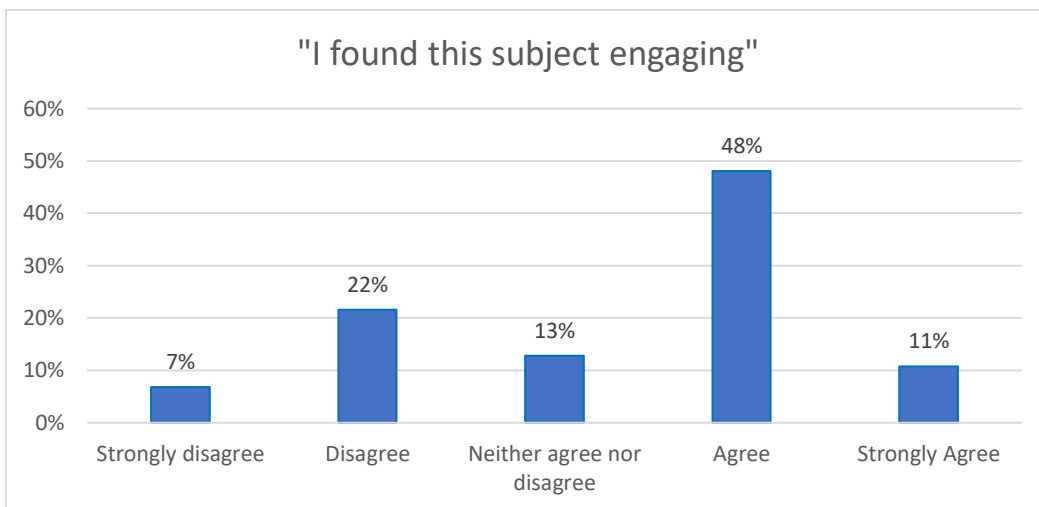

Figure 2. Responses to the question: to what extent do you agree with the statement "I found this subject engaging"?

In the focus groups students and tutors also reported a lack of engagement with the subject, citing a variety of reasons that included the compulsory status of the subject and the perceived lack of relevance of research methods. Others suggested the lack of engagement could be linked to the COVID-19 pandemic, which is known to have had an impact on student wellbeing and learning (Wang et al., 2020). The fact that this coincided with the implementation of the video resources present compounding factors, which need to be kept in mind in terms of their impact upon students' engagement with the videos.

To determine the relationship between engagement with the subject and with the videos, the responses related to video engagement were separated for those students who were and were not engaged with the subject as-a-whole (Figure 3).
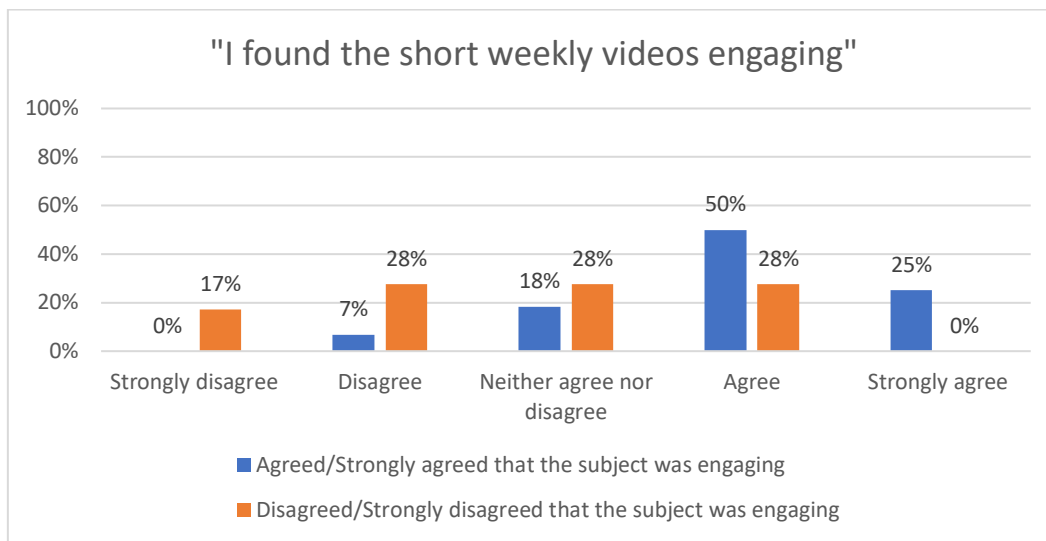
"I found the short weekly videos engaging"

Figure 3. Responses to the question: to what extent do you agree with the statement: "I found the short weekly videos engaging" according to students' engagement with the subject as-a-whole.

This figure illustrates that students who were engaged in the subject mostly also found the videos engaging, and conversely, a lack of engagement with the videos at least in part also reflected of a lack of engagement with the subject. Notably, some students (28% n = 8) who disagreed or strongly disagreed that the subject was engaging, agreed that the videos were engaging, suggesting that the videos may have assisted to lift levels of engagement, even for those students who did not perceive the subject itself to be engaging.

According to the survey responses, students largely felt that the videos assisted in their learning. A small majority of survey respondents (52%; n = 48) thought that the videos reinforced ideas covered in class, while only 6% (n = 6) felt the videos opened-up their thinking beyond what they had previously considered (Figure 4). A substantial number of respondents (33%; n = 31) felt the videos were 'somewhat helpful.' Only 9% (n = 8) perceived that they did not assist with their learning at all.

"To what extent did the video content assist in your learning?"
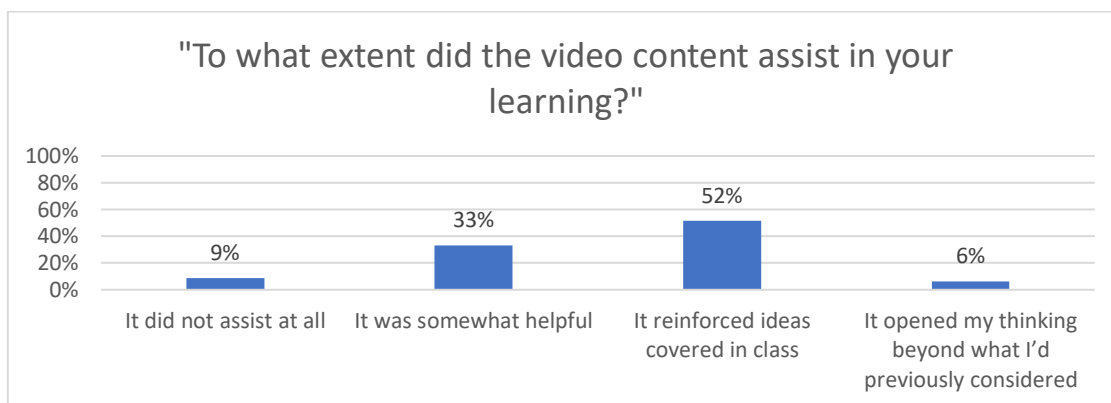

Figure 4. Responses to the question: "to what extent did the video content assist in your learning?"

Findings from both the survey and the focus groups support the view that short videos can be effectively used to enhance cognitive engagement by introducing students to course content in an accessible manner. 75% (n = 68) of survey respondents either agreed or strongly agreed that the videos helped them to better understand ideas and materials covered in the subject (Figure 5). In the focus groups, as well as in the open-ended survey responses, students noted that the videos reinforced the key concepts in the course in a "simple and digestible" format and served as a helpful overview for revision and assignment preparation. In this way, the videos served this key purpose.

The videos "helped me better understand ideas and material covered in the subject"

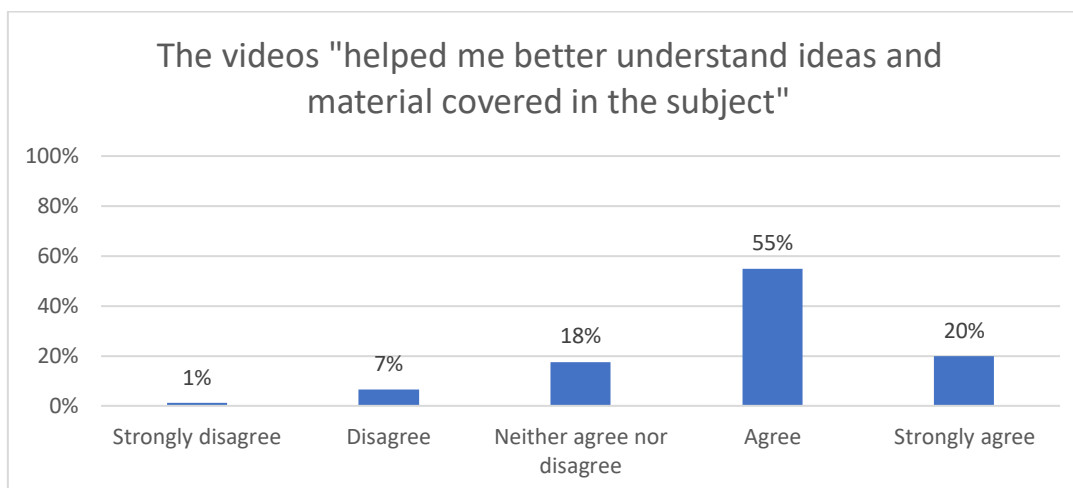| Response	Percentage
Strongly disagree	1%
Disagree	7%
Neither agree nor disagree	18%
Agree	55%
Strongly agree	20%

Figure 5. Responses to the question: How did you experience the videos? – To what extent do you agree with the statement: "They helped me to better understand ideas and materials covered in the subject?"

Qualitative responses in both the survey and focus groups suggested that many students appreciated the role the videos played in preparing them for class:

Isabelle: I definitely enjoyed having them [the videos]. For me, at least in the way it was used in [subject], it was more of, like, an introductory snapshot for what we're doing for the week […]
Moderator: Yeah, and what about you, Yasmin, how do you see them?
Yasmin: Definitely, I think, videos and more visual depictions can make it easier to understand a concept, or comprehend it thoroughly. For example, if you read, do a reading, sometimes things can be taken out of context, 'cause you're just reading what people wrote, not really their emotions attached to that. But by watching videos, or, like in [subject], we have introductory videos for each week, so that allowed us to really delve into the topic, and really understand and prepare for that topic.

According to these students, the videos were a useful way of attuning themselves to the subject content in the week ahead. This resonates with other groups where students emphasised the "background knowledge" that the videos provided, while one of the tutors suggested that the videos were a "nice way to start engaging with the rest of the materials." One survey respondent commented that the videos made them "feel less frazzled when watching the lectures" and a focus group participant commented that, "there's no pressure of learning additional content from the videos. They're there to reinforce your learning."

These comments demonstrate the role that short videos can play in reducing cognitive load by providing students with prior knowledge and increasing their understanding of key concepts before they attend lectures (Hadie et al. (2019). Supplementary video materials are known to help achieve optimum cognitive engagement (Mayer & Moreno, 2003; Ljubojevic et al., 2014), provided that video design assists in balancing cognitive load. This can be achieved through techniques such as segmenting material, highlighting key information through signalling, using keywords on screen, weeding out any extraneous information, and matching auditory and visual modalities to illustrate and explain concepts (Brame 2016; Ibrahim et al. 2012), which were all techniques employed in the short videos created for this subject.

Another way in which the videos aimed to promote cognitive engagement was through the inclusion of examples, case-studies and real-world scenarios, which have the potential to allow students to see the videos as useful and relevant to their own lives (Galatsopoulou et al., 2022; Nagy, 2018). While the survey responses show that students had differing perceptions as to whether the videos successfully achieved these goals, the majority of students (65%; n = 59) either agreed or strongly agreed with the statement that the videos "made the subject content feel relatable, interesting and/or engaging" (Figure 6). Similarly, the majority (56%; n = 51) either agreed or strongly agreed that the videos enabled them to connect topics covered in their studies to their everyday life (Figure 6). Many students in the focus groups commented on the relatable aspects of the videos; for example, one participant stated, "I think that's what did make it a

little bit more engaging where you can be like, "Ah." Like, you can relate it to the, it has some kind of real-world application."
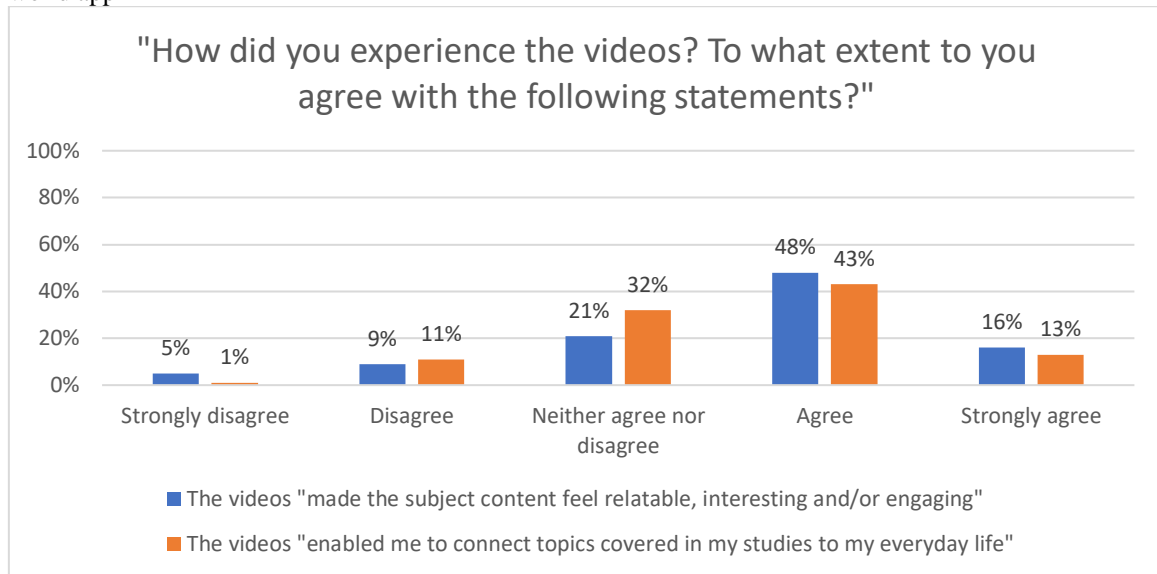

Figure 6. Responses to the questions: How did you experience the videos? – To what extent do you agree with the statements: "They made the subject content feel relatable, interesting and/or engaging?" and "They enabled me to connect topics covered in my studies to my everyday life?"

Behavioural Engagement

Behavioural engagement involves students' active participation in teaching and learning activities. In our study it relates to *how* students engaged with the videos, including whether they chose to watch them and if so, when, as well as their self-reported reactions.

The survey results reveal that students' engagement at the behavioural level was diverse across the cohort. Of the 102 students who responded to the survey question asking how often they viewed the videos, only 23% (n = 23) of respondents stated that they watched the videos every week, while 28% (n = 29) watched them most weeks, 40% (n = 41) watched them occasionally and 9% (n = 9) didn't watch them at all (figure 7).
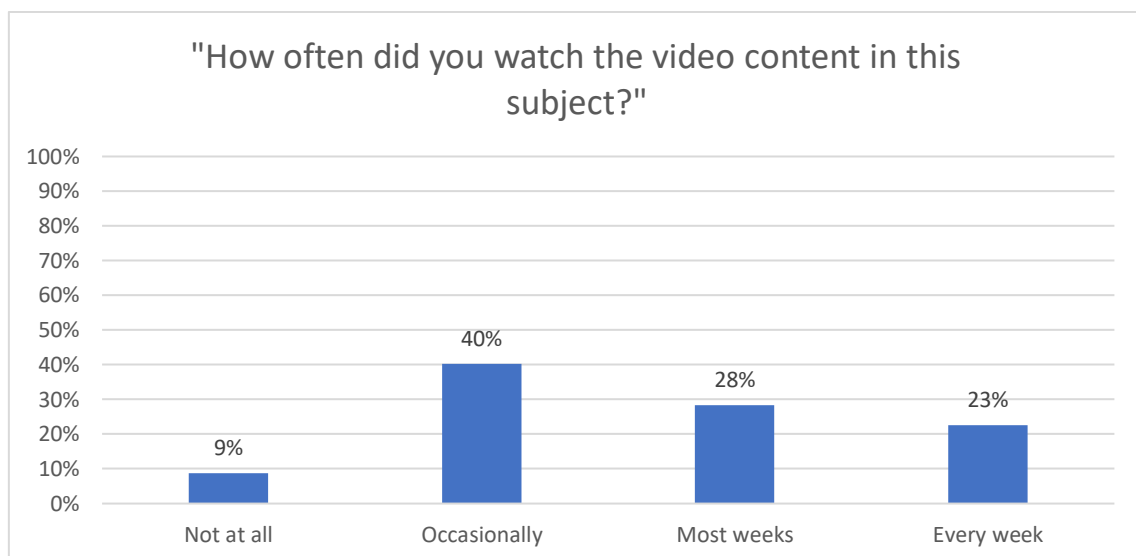

Figure 7. Responses to the question: "How often did you watch the video content in this subject?"

Again, we cross-tabulated the results for this question with the responses from those students who stated they did and did not find the subject engaging (not shown here), which revealed that students who never watched the videos or watched them only occasionally were largely those who reported disengagement with the subject as-a-whole, while those engaged with the subject tended to watch the videos more often.

These results are supported by the unique viewer counts obtained from LMS analytics which show that on average, across the 9 videos, 57% of the full cohort of 677 students viewed the weekly videos. Further, these analytics indicate that the majority of unique views for each video occurred within a two-week period around a given lecture. The survey provides further insight into this: although the majority of survey respondents (62%; n = 58) who watched the videos stated that they viewed them before the weekly lecture, a considerable percentage of students (32%; n = 30) viewed them after the weekly lecture, and a smaller percentage (6%; n = 5) only viewed them when reviewing material at the end of the subject, showing that student engagement behaviours did not always correspond with the intentions of the subject design. Another insight that emerged from the analytics data, is that there was a drop in engagement in the second part of the semester, which corresponded to assessment deadlines. This finding corroborates previous research showing that student engagement not only varies across the semester but that assessments tend to cause changes in behaviour (Boulton et al. 2019).

Many focus group participants saw the videos as an "extra thing" and one of the tutors observed that the videos tended to be viewed as "another burden." Similarly, the survey responses to the open-ended follow-up question targeting those respondents, who stated that they did not watch the videos at all (n=9), clarify that students either felt that the compulsory materials were sufficient for understanding the weekly topics, or that they lacked motivation or time to engage with the video content. This reason may seem surprising, given that the videos were mostly only around 3-minutes in length, but it emerged repeatedly in our study. While the videos aimed to introduce the weekly topics succinctly and might be perceived as a way for students to save time later by being 'primed' for the readings and lecture content, it is clear that this was not how most students viewed them. One survey respondent commented that, "Whilst the videos might seem like a good idea, in reality they present extra work for students already busy with multiple lectures, readings and essays."

Given that students spend much longer periods of time on other teaching and learning activities, including attending lectures and engaging with required readings, such comments and behaviours suggest that students may not perceive videos to be especially beneficial to their learning. This also reveals a potential misunderstanding of the function of the videos and their potential value, which could be related to a lack of familiarity with using videos as supplementary materials, to lack of communication from teaching staff on the benefits of the videos and/or to a lack of integration of the videos into the other parts of the curriculum. The possible reasons for disengagement are synthesised well in one student's response to the survey, which simultaneously conveys an appreciation for the videos and an absence of engagement with them:

> I should have made the time to watch the video content as well as doing the lectures and readings. However, given the combined workload of all my subjects, and feeling as though I understood the weeks' content from the lectures and readings, I didn't feel the need to engage with more material. Particularly, because it wasn't required in order to engage in and contribute to the tutorials (if this was the case it wasn't clear to me). With this said, in hindsight the videos did look really useful, and I do wish I watched them and did the weekly quiz modules as I'm sure it would have reinforced my learning.

Existing studies suggest that incorporating interactive elements or assessment tasks into or alongside video resources help to boost student engagement and active learning (Brame, 2016; Zhang et al., 2006; Lawson et al., 2006), and videos that encourage passive viewing of content have received criticism (Winslett, 2014). Therefore, in the focus groups, we were interested in exploring whether adding an assessment component that was directly related to the videos might have increased student engagement, at least by providing an extrinsic motivation for students to watch the videos (Serin, 2018). With only one exception, the focus group participants were adamantly against this suggestion, arguing that such an approach would deter students from engaging with and learning from the content because of the added workload and "learning pressure." Opposition was also reflected in one of the tutor's comments that the

students would "resent that." One of the aspects that students appreciated about the use of videos in this subject was precisely the optional role that they played in the curriculum.

The preferences students expressed when discussing their behavioural engagement with learning in the focus groups – a broad range of delivery modes, a combination of written, visual and aural content – support general principles of multimodal learning (Sankey et al., 2010). In fact, the multimodality provided by these videos was one of their key benefits for many students. Some focus groups participants specifically noted that they valued the "visual representation" of the content, especially since most of the material they come across in their studies is written. Others preferred to engage with them aurally, and appreciated the flexibility offered by the videos. For example, one student said, "I would, like, put in my headphones and, like, listen to them when I'm walking down the road towards uni." Such comments reinforce a study by Guo et al. (2014) that found students enjoy the agency videos provide, both in that they allow them to pause, skip and re-watch learning materials, and to use those materials to tailor their study to meet their own learning needs.

Affective Engagement

Affective engagement is associated with students' emotional and embodied responses during their learning and is also related to a sense of identification and belonging (Fredricks at al., 2004), which can be brought about by investment in academic content or a teacher. Given that the teacher played a central role in the videos created for this subject, we were especially interested in the extent to which the videos had succeeded in creating a sense of teacher presence for the students, and in turn, whether teacher presence could enhance students' connections to the subject content, the subject, and the University.

Student responses in the survey and focus groups generally reinforce findings from previous studies that teacher-generated video content has a positive impact on teacher presence, particularly for large cohort, flipped subjects, where students do not have much opportunity to interact with the lecturer/subject coordinator one-on-one (Draus et al., 2014; Bialowas & Steimel, 2019; Dart et al., 2020; Wong et al., 2021). 73% (n = 67) of survey respondents either agreed or strongly agreed that the videos made the subject coordinator feel more present and approachable (Figure 9). Of all questions relating to the students experience of the videos, this question received by far the smallest indication of disagreement or strong disagreement (only 3%; n = 3), although there were a considerable number of neutral responses (23%; n = 21).
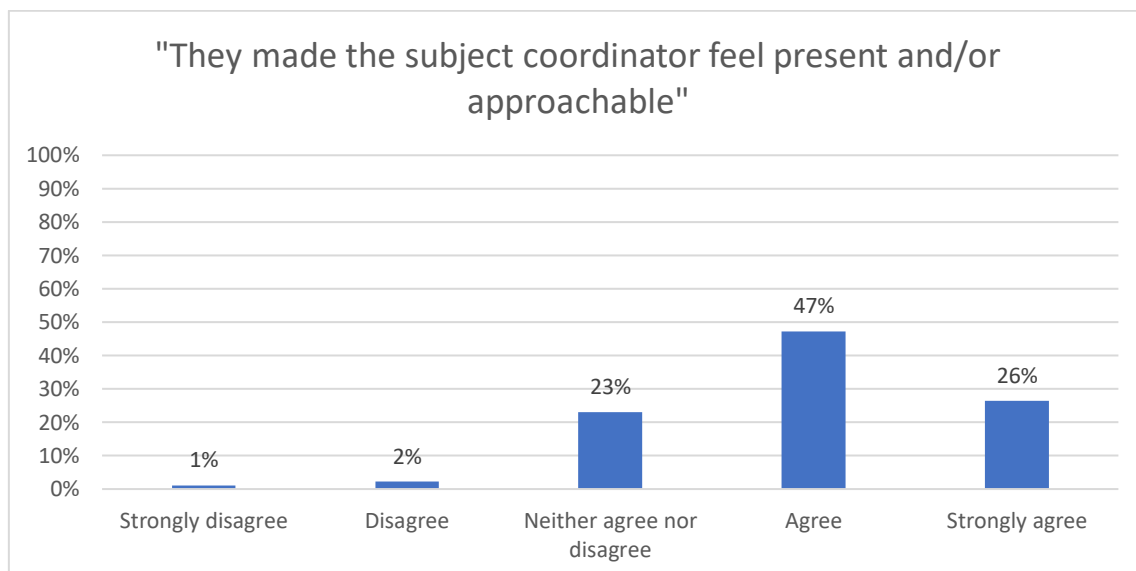

Figure 9. Responses to the question: How did you experience the videos? – To what extent do you agree with the statement: "They made the subject coordinator feel present and/or approachable"?

The survey results were supported by the findings of the focus group discussions in which most students agreed that the videos helped them feel connected to the lecturer. This is clear from the focus group excerpt below:

> John: Yeah, overall, the production was really good, and I did find it, like, engaging.
> Moderator: Mm-hmm. What about, you, Georgia?
> Georgia: Yeah, I thought they were really well-made […] when you can tell that effort's been put into something, you have to like, you're more inclined to actually engage with it and give it the time of day. So that was motivating. Yeah, it was nice to kinda see the lecturer in like, a, more like, not casual but not, you know, lecturing kind of environment. […]
> Moderator: Yeah. And did you feel like they helped you feel connected to the teacher in any way?
> Georgia: Yeah, definitely, I think so. For sure.
> Moderator: You felt that too, John? It helps you get a sense of-
> John: Yeah. I guess, it's just sort of, expanding on that point, Georgia explained that well, where seeing [the lecturer] in a context beyond the lecture hall was...yeah, it just, it felt... like, a YouTuber, like the feeling you get when you watch YouTube, and you're like, 'mm-hmm', like 'I sort of connect with you', but in a different realm […]
> Moderator: What do you think, Quinn?
> Quinn: Yeah, I do agree with both of them, and I think the videos are kind of, like, more casual for me.

The students in this group all agree that the videos were effective in creating a connection to the lecturer, which for them is due to the "casual" nature of the videos that show the lecturer outside of the "lecturing kind of environment". Students in other focus groups mentioned similar aspects, like "it kind of makes her seem more approachable as a lecturer, which I think is important for engagement as well" and, "seeing her in different settings, and different environments, and different clothing, and, you know, even just little things like what jewellery she's wearing, all those sorts of little bits and pieces, you kind of piece together more of an idea of her and get a little bit more familiar with her." In this sense, the videos seemed, at least to some extent, to aid in representing the lecturer as more than a one-dimensional person. The tutors echoed this point, adding that the videos helped the students connect with the teacher and see her as an actual person, rather than a "mythical figure".

The role the videos played in enhancing teacher presence appeared to be especially important for those students who were studying remotely and didn't have the opportunity to attend live lectures. These students were largely international students who had never been on campus. In the focus groups, some of the international students residing overseas mentioned that despite never meeting the subject coordinator in-person, the videos made them feel more comfortable and connected. As one student said: "If I walk down the street and I saw her, I know, 'okay, she's my coordinator. I can say hello to her.'" This was in contrast to local students who were able to interact with the coordinator during the weekly lectures.

What is also clear in the except above is that the style of the videos mattered. The videos were filmed and edited by a video producer and had high production values. However, they had both formal and informal stylistic features as they were conversational in tone, and the coordinator spoke in a relaxed and personal manner aiming to connect the course concepts to the students' everyday lives, as discussed earlier. This appeared to impact upon students' motivation to engage with the videos; for instance, a focus group participant suggested that "the professionalism and the documentary style" gave the impression that the subject was "like legit . . . I better take it seriously." However, there was disagreement on this in some groups as some students perceived the high production quality created a sense of distance from the teacher. One student stated: "I feel like there's a distance between me and her because, like, she's so professional" and another suggested that: "If it was done in a more kind of candid, um, manner, it would maybe be a little bit more effective." This disagreement does raise the question as to whether it is necessary or advantageous to invest in high-quality video production for teaching and learning purposes if affective engagement and teacher presence can be just as effectively created through amateur self-recorded videos.

In previous studies, the style of the videos has been shown to have an impact on students' sense of connection with the teacher. Some argue that professional videos with high production quality are not as

effective for student engagement as informal videos (Guo et al., 2014; Dart et al., 2020). Dart et al. (2020) for example, found that the students in their study were not critical of amateur or unskilled video production and appreciated the personal, conversational style from the teacher, adding that it made them feel more connected to them. Similarly, students are often drawn to open access educational video content on online media and social media due to the simple and friendly production style (Shoufan, 2019). This was reflected in the focus group discussions in which multiple students pointed to their preferred platforms for accessing video materials (e.g., YouTube) and felt that the videos in the subject were emulating these.

Conclusion

In this paper, we have reported on the findings from a mixed methods study that examined how students perceive and engage with video technology that is presented as one (optional) element to enhance student learning and subject engagement. Analysing our data on technology use through a tripartite definition of engagement as consisting of cognitive, behavioural and affective dimensions enabled us to identify nuanced insights into how student engagement can operate. While we found that students reported considerable cognitive as well as affective engagement with the video materials, the behavioural dimension was less strong. Hence, our analysis of the data revealed a gap between how students perceive the educational value of the videos (their cognitive engagement), and the affective reactions to them (their increased sense of teacher presence) on the one hand, and the ways in which they engage with them (their behavioural engagement) on the other. Data from both the survey and the focus groups suggested that students mostly appreciated having the videos available to them, and that they largely perceived them to be beneficial to their learning. However, this did not mean that they engaged with them, or if they did, that they engaged with them in the intended way, in relation to timing and sequencing. This finding is consistent with other research, such as a study by Henderson et al. (2017) that argues learning technologies are simultaneously central to the student experience at university *and* not particularly transformative or disruptive to the student experience. In other words, students appreciate the availability and flexibility of learning technologies such as videos and make use of them according to their own perceived needs, but these uses are not always in line with the intentions of their teachers, or with best pedagogical practice.

Of particular interest were the discussions around time use. Students seemed to perceive a linear or accumulative time investment, where all activities were simply adding up, meaning that additional content like the short videos became yet another thing to do, rather than seeing some activities (like the videos) as 'time investments' that might enable them to save time later (e.g., by being able to read required materials faster or understand lectures better because they would already be 'primed' for key concepts). This suggests that more explicit communication and instruction around the aim and intended use of the videos might be necessary. While the videos attempted to 'demonstrate' (cf. Merrill 2017) the everyday relevance of concepts rather than mainly present key ideas, they nevertheless remained a predominantly passive rather than active format as they sought to prepare students for the subsequent learning activities. However, it might also be that students do in fact not experience a later 'return' on such a time investment in terms of easier digestion of other learning materials, in which case the inherent value of each video needs to be clear.

Given that short supplementary videos are not customarily used as pre-lecture resources in university courses, there is a pedagogical need to ensure that their value and purpose in the curriculum is clearly explained to both students and teachers. Responses in the focus groups suggest that in this case this was not fully achieved within the first year of implementation, particularly not for tutors. While some tutors integrated discussion of the videos into their classes, others never referred to them. This inconsistency was reflected in both the survey and focus groups as some students said that they were unaware of the videos as their tutor had not mentioned them or underlined their importance.

This paper has contributed important insights into how students engage with specific learning technologies, in this case short videos. Understanding how and why students choose to engage with such materials or not may challenge our assumptions about what they value and how they engage with such technologies. In this reported study, student uses, and perceived value of the videos, did not fully match the intentions of learning designers and the subject coordinator, however, it is important to take note of how students navigate their learning journeys in 'real life' if we are to develop effective uses of learning technologies.

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