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Authors

Jackie Hammill[a]*
First Year College, Victoria University, Melbourne, Australia

Thinh Nguyen[b]
First Year College, Victoria University, Melbourne, Australia

Fiona Henderson[c]
College of Arts and Education, Victoria University, Melbourne, Australia

Suggested running head: Mindfulness in Higher Education

*Jackie Hammill: Corresponding author
Email: Jackie.Hammill@vu.edu.au
ORCiD: 0000-0002-3408-6127
Address: Victoria University, Ballarat Rd, Footscray VIC 3011
Phone: +614 357 35732

Word Count: 6959

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Most of our current university student cohort, known as GenZ, have grown-up in a digitally connected world with access to various technological devices and social-media platforms. While technology can assist to engage students, in the learning environment many students spend a significant amount of time switching between devices engaging in non-learning activities. This results in decreased engagement which can adversely affect their academic performance. Conversely, students who can self-regulate their technology usage are more likely to be engaged in the learning process. Mindfulness is a strategy that can encourage students to self-regulate their thoughts and behaviours to stay on task. Previous research has focused on student's in-class technology usage, self-regulation and mindfulness to enhance engagement. This study adds to current research by investigating short mindfulness practices in a higher education first year business degree. The paper examines the usefulness of two mindfulness interventions to encourage students to self-regulate their in-class technology use and enhance engagement. Using a critical realist lens, the paper incorporates quantitative and qualitative data analyses through student surveys and focus groups. Twenty-nine first year undergraduate students were exposed to the mindfulness interventions. Results indicate the mindfulness interventions improved students' ability to self-regulate, contributing to student engagement and feeling connected at university.

Keywords: Higher education, Student engagement, Mindfulness, Self-regulation, Critical realism

Introduction

The majority of today's university student cohort are born between 1996 and 2010. Known as GenZ (Turner, 2015), they have grown up in a hyper-connected technological world. While technology has made it easy to access vast amounts of information

instantaneously and connect with others, it has led to many people developing unhealthy relationships with their mobile devices (Cheever et al., 2014). Within the higher education context, the prevalence of smart devices in the university classroom have led to innovative uses of technology to enhance teaching delivery and student engagement (Howard et al., 2016). Often however, mobile devices have had the negative effect of distracting students from their learning. When technology is used in class, for non-learning purposes, it decreases students' ability to engage with other students, the curriculum and the wider learning environment (Cao & Taian, 2020). Various strategies have been considered to minimize the unwanted distractions caused by smart devices in the classroom. One such strategy includes increasing students' mindfulness and self-regulation of their device use. Through a critical realism lens, this study uses a mixed methods approach to investigate the effectiveness of brief mindfulness interventions, for encouraging students to self-regulate their in-class use of technology thus enhancing student engagement.

GenZ and Technology

When students access their technology in class for non-learning purposes, they are engaging in multitasking, the act of undertaking two or more tasks simultaneously. Multitasking divides students' concentration on each task (Thompson, 2017) which distracts from learning time. This leads to poor understanding of the course content (Kuznekoff & Titsworth, 2013), weakens learning outcomes (Mercimek et al., 2020) and negatively affects class engagement (Jamet et al., 2020). In Jamet et al.'s research on 187 first-year university students, 91% disclosed they multitasked during class for

75% of the time, indicating an inability of students to regulate their use of technology in the classroom.

The authors in this study acknowledge that the use of technology can be beneficial in the learning process and when used purposefully, can encourage student engagement (Howard et al., 2016). Law and Stock (2019) demonstrated that the use of technology for academic related tasks can be beneficial in the classroom; such as, using cell phones for answering polls or taking notes on a computer. Social media can also assist to expand students' networks. In a study involving 224 undergraduate business students, Pan et al. (2019) found social media platforms had the ability to enhance social connectedness. However, while Pan et al. noticed that the use of social media added to students' social networks no significant findings were seen in the area of bonding, strengthening of trust or emotional support between students. Therefore, it appears that while student networks grew, there was not a strong sense of engagement, with these new connections.

Contrastingly, Goodchild and Speed (2019) found that there was a lack of evidence that technology-enhanced learning practices or added value to learning environments arguing that it "is fundamentally additive technology that does little to transform the pedagogical task of learning" (p. 960). There is no guarantee that technology will transform the learning environment and can indeed be detrimental to student engagement and academic outcomes.

It is not technology itself that is of concern in the current study but how students use it in-class. Research shows that students' in-class use of technology is mainly for non-educational purposes such as sending texts, making calls and accessing social media (Villena-Martínez et al., 2021). This lack of technological regulation leads to

decreased learning, collaboration and engagement within the learning environment (Cao & Tian, 2020).

Self-Regulation

Where technology is readily accessible, the ability to self-regulate is essential for personal and professional success (Zimmerman & Schunk, 2001). This is especially so in higher education where students are expected to be autonomous learners (Jansen et al., 2019). Autonomous learners self-regulate their thoughts, feelings and behaviours to better focus and achieve their academic goals. Zimmerman (2002) suggests there are three phases of self-regulated learning; forethought, performance and self-reflective. The forethought phase involves setting goals; the performance phase involves self-regulating strategies; and the self-reflective phase involves reflection after learning. These phases assist learners to be conscious of, and take steps to control distractions (Pintrich & De Groot, 1990).

Encouraging students to monitor and self-regulate their use of off-task technology use assists students to be more engaged in the learning environment (Cheever et al., 2018)**.** This encouragement needs to be explicit and come from the educator, even if this is not normally seen as part of an academic's role. Deng (2020) urges educators to discuss the negative effects of off-task multitasking with students and provide them with strategies to regulate their technology access. These strategies can encourage behaviour changes (Terry et al., 2016) and influence students' usage of, and thinking around, their multitasking behaviour.

This study investigates the use of brief mindfulness interventions to encourage students to self-regulate their in-class multitasking behaviour to enhance engagement. Henrie et al.'s (2015) definition of student engagement as "a commitment to

participation and/or involvement in learning" (p.2) is used here. This participation involves a learner being cognitively and behaviourally involved in a learning task (Pellas, 2014). When students are involved in technology multi-tasking, they are less engaged with the learning environment (Soomro et al., 2019), hence the importance of encouraging self-regulation behaviours. Mindfulness is a strategy that can assist students to be conscious of their self-management of technology in order to decrease its negative consequences (Hartley et al., 2020).

Mindfulness

Brown and Ryan (2003) define mindfulness as "the state of being attentive to and aware of what is taking place in the present" (p.822). Huppert (2017) theorises that awareness and attention are fundamental to learning new skills and can contribute to an individual's ability to self-regulate behaviour (Kaiser et al., 2020) which can lead to heightened student engagement (Noble & McGrath, 2015).

According to Langer and Moldoveanu (2000) mindful students actively engage in the learning process and are aware of what is happening in their immediate surroundings. Mindfulness training can assist to increase students' concentration (Thompson, 2017), and self-awareness (Huppert, 2017). Students who are more aware of their environment are better able to regulate their thoughts and actions which can enhance engagement (Garland et al., 2015).

Mindfulness research has shown that even brief interventions can produce positive outcomes for students (Reilly, 2020; Miller et al., 2017). Although both Reilly and Miller et al.'s research implemented short mindful interventions, like many studies in higher education, the interventions were based on meditation practices (Blackburn, 2015). In addition, although there has been a plethora of studies on mindfulness in

clinical and non-clinical environments, there have been few in higher education (Prado & Anastacio, 2018) and even fewer within business schools (Bukeavich, 2020).

This study adds to current research surrounding mindfulness, self-regulation and engagement in that it is situated within a higher education first year business degree, and investigates short mindful practices, not based on meditation practices. The authors use Langer's (Langer & Ngnoumen, 2017) concept of "mindfulness without meditation" (p. 98) to explicitly address the importance of students self-regulating their use of in-class technology to improve their engagement.

Method

This mixed methods study utilises both quantitative and qualitative data, through a critical realist lens, to investigate student engagement at an Australian university. Sturgiss and Clark (2020, p. 144) describe critical realism as a "set of philosophical tenets" that can inform mixed-methods designs, which "seek to understand different phenomena". A critical realist approach is useful in complex environments, such as universities, to help understand why an intervention may or may not work (Sturgiss & Clark, 2020). Unpacking the elements that lead to student engagement is complex as psychosocial, cultural and environmental factors need to be considered (Kahu & Nelson, 2018). Critical realism assists researchers to "unpack the influence of context on intervention effectiveness. Rather than assuming that interventions hold the power in and of themselves to effect change" (Sturgiss & Clark, 2020, p. 144). Our study recognises students as agents within the engagement process and aims to identify similarities between student voices and quantitative data from student surveys, together with self-regulation and engagement theory, to help understand the interventions' effectiveness.

Setting

This study was undertaken at an Australian university in 2019. In 2018 the university transformed its first-year delivery from a traditional 12-week course to a four-week intensive block course. In part, this transformation was undertaken to enhance student engagement and retention. With the block course, classes were delivered in-person, three days a week, for three hours each day. Student class numbers were capped at 35 and courses became sequential rather than concurrent.

This research investigates the potential of mindful self-regulation interventions, to assist with first-year business students' perceived ability to self-regulate their in-class multitasking in order to enhance engagement in the learning process. The first-year business program consists of eight compulsory courses. At the time of data collection students were in the second half of their first year of study, undertaking a marketing course.

Participants

Twenty-nine first year undergraduate students participated in the study. Females represented 21% of the sample and males 79%. All participants were domestic students, and ages ranged from 18 to 37 with a mean of 21 (SD = 3.9). The majority of students were undertaking a business major (94%), with one student embarking on a psychology-business degree and another a sport-business degree. Students' previous experience with mindfulness interventions were unknown. The study was approved by the university's Ethics Review Board and written consent was received from participants.

Measurements and Procedure

Results were analysed with qualitative and quantitative data from student self-

perception surveys and focus group comments. Henrie et al. (2015) assert that self-reported statistics are an appropriate tool to use when assessing student engagement as engagement includes aspects of self-perceptions and behaviour. One data set looked at students' perceptions of how engaged they were with the two mindfulness interventions. A second data set asked students to indicate the extent the course made them feel engaged and connected to the learning environment. The final data set collected at the end of weeks one-to-three reflected students' perceptions of their mindfulness within the class. The above data were collected via paper-based activities in-class. Students were asked to write comments to support the data and, where appropriate, these individual and focus group comments are included in the findings. All data were anonymous. The specifics of each intervention are described below.

Mindfulness Interventions

Students experienced two interventions, the first was a three-minute video (Gehart, 2017) viewed in the first class and the second intervention was a weekly discussion around being mindful in terms of students' use of technology. With the first intervention, students watched a short mindfulness video that discussed neurological changes that occur in the brain when mindfulness is practiced. The video, based on scientific research, provided a transition into the discussion interventions.

At the beginning of the course students were asked to think about the grade they wanted to achieve for the course. They were encouraged to consider their life-load and be realistic as to the amount of time and focus they could put into their studies as the higher the grade expectation, the more time and focus was required. This process of considering expected outcomes, reflects the first phase, forethought, of Zimmerman's (2002) self-regulated learning framework.

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In Zimmerman's (2002) performance phase of self-regulation, students self-observe and control their environment. This phase is evident in the mindfulness interventions where students were encouraged to be aware of the distraction their technology posed. Once aware, students were better able to control the urge to access technology for non-academic activities. Zimmerman's third phase, self-reflection, involves students evaluating their progress towards their goals. In this study, at the end of each week students were asked to reflect on how present they had been in class in terms of not accessing their technology. Table 1 displays the interaction between elements of critical realism, mindfulness and self-regulation phases that worked together to influence student engagement.

INSERT TABLE 1 HERE

At the beginning of the first class each week there was a class discussion on in-class distractions, multitasking and self-regulation. During that first class, student groups identified their top three classroom distractions. All groups reported their phones, and technology in general, were the main distractions.

As students acknowledged the distractions that their technology presented (see Findings), at the beginning of each class the instructor encouraged students to be mindful of and to self-regulate their technology multitasking behaviour. This involved the instructor recommending that students put their technology away when it was not required for class activities. Saying this, it was up to students to choose if and how they exercised their technological regulation.

Engagement and Connection Perceptions

As both engagement and connection are important to academic success, students were asked to comment on two questions based on current research surrounding elements that affect student performance (Pekrun & Linnenbrink-Garcia, 2012). The survey asked to what extent the course made them feel: engaged in the learning process and connected to people at university. Items were rated on a 10-point Likert scale, from 1 = not at all, to 10 = very much. Reliability for the 4-item scale showed good internal reliability consistency, Cronbach's alpha = 0.95 for the current sample (Pallant, 2016).

The 10-point Likert scale was used as many individuals are familiar with giving ratings out of 10. Dawes (2008) analysed 5-, 7- and 10-point scales to ascertain if scale format might influence data and identified that 5-, 7- and 10-point scales were all comparable for analytical purposes.

Student Mindfulness Perceptions

To assess the effect of the mindful interventions, students' perceptions of their ability to self-regulate their technology while in class was measured at the end of weeks one, two and three. At the end of each week students were asked to reflect on the extent that they perceived they were mindful of, and able to, regulate their device usage during class that week. Their self-perceived levels of mindfulness were anonymously expressed as a percentage, on a sticky-note and posted on a white board. The notes were used to measure participants' self-perceived engagement, a technique previously used by Tassone (2015). The percentages were collated each week and the weekly average for the participant group calculated. Obtaining data at three touch points recognises, as Kahu et al. (2020) note that engagement is not static, it is influenced by both context and time; therefore, data from three intervals provides fuller insight into possible

fluctuations in engagement levels.

Focus group

A focus group was undertaken on the last day of the course. Five students self-nominated to participate. The focus group was conducted by the study's secondary researchers to decrease bias. Using a critical realist approach, the "interviewee is cast as the expert…and the interviewer, as the learner" (Sturgiss & Clark, 2020, p. 144). In practice, the interviewer asks questions to gain a better understanding of the interventions' effectiveness. Also, in keeping with a critical realist approach, through reflective thematic analysis (Braun & Clarke, 2021), the data were coded using NVivo software. The coding process allowed for reflection on participants' comments and led the generation of initial themes. Themes were then used to identify connections between students' qualitative responses, existing engagement and self-regulation research and quantitative data from student surveys. As Kahu et al. (2020) affirm, the student voice "is a valuable tool for understanding student engagement" (p. 660). The focus group was digitally recorded and transcribed by the primary researcher. Students' reflective perceptions supported the effectiveness of the mindful interventions to enhance students' self-regulation of technology to engagement.

Data analysis

At the end of the course, data were analysed to assess the interventions' impact on student mindfulness. A chi-square test ($\alpha = 0.05$) assessed the significance of students' perceptions to survey questions surrounding their perceived engagement and connection during the course and the end-of-week mindfulness percentages. Prior to conducting the chi-square test the expected frequency assumption was assessed, no cells had expected frequencies below five, indicating the expected frequency assumption was not violated.

Results

Students were asked to reflect on their engagement with the interventions at the course end, the course overall and how present they were in class each week. Students' comments were collated from the anonymous student surveys in class and the focus groups. Extracts from student surveys are illustrated using an 'S' and a number representing the student who gave the comment, likewise, focus group comments are represented with FG and a number corresponding to a student.

Mindfulness Interventions

At the end of the course, students were asked to comment on how useful they perceived the mindfulness video and the discussion intervention. Students generally found the neuroscience video on mindfulness interesting and useful with one student commenting 'the strategy about mindfulness was encouraging, my attention span is really bad, and the video showed how if you work at it you can improve' (FG1). This example provides insight into this students' fixed mindset, and how the video offered evidence and 'hope' for change. Zimmerman (2002) refers to causal attribution, part of the self-reflection phase where an individual judges their future performance based on past experiences.

From a critical realist perspective, the mindfulness video intervention, was the mechanism that led to the outcome of the student recognizing they could increase their attention span through mindful self-regulation, thus assisting to change a previous fixed mindset. Figure 1 shows that 85-90% of students found both the video and the mindfulness discussion intervention useful.

INSERT FIGURE 1 HERE

The chi-square test was positively significant indicating a high level of interest in both interventions ($p = 0.001$). Cohen's w was above 0.7 indicating a large effect size. The expected frequencies assumption was not violated.

The survey questions explored students' perceptions of the mindfulness discussions which encouraged students to develop self-regulation in regard to their use of technology in the classroom. In the focus group and in the end of course survey, students were asked if they would continue to focus on being mindful in future. The majority, 97% stated they would, with only one student (S4), being unsure. Although S4 was unsure about future mindfulness behaviour, this student's comments reflected those made by 14 other students who said that focusing on mindfulness assisted them to concentrate on what was happening in class. For instance, S14 said minimizing 'the use of un-needed technology helped me focus more' and S23 thought 'it helped me be more mindful'. While S25 identified as being a good regulator of technology, also acknowledged the need to continue 'trying to stay in the moment longer and not let my mind wonder off'. The comments reflect that even students who identify as having good technology regulation, still benefitted from the intervention as they were aware of the need to regulate their thoughts to enhance engagement.

Students who identified as being good technology regulators (31%) and those who thought it was a good idea (35%) together make up 66% of the responses. It seems logical that if students are already regulating their technology, they therefore think it is a good idea to do so. Indeed, even though 14% of students commented that they found it difficult, these four students also recognised the importance of being mindful. For example, S24 stated 'I attempted trying to put my phone down, which sometimes worked' and that in future would try 'to not constantly touch my phone'. Another student (S26) acknowledged that regulating technology 'was difficult but also allowed

complete focus on discussions'. Only one student (S15) commented that the intervention was 'unnecessary because I would have preferred to type my notes'. Interestingly, S26 also indicated they would continue to practice being mindful, perhaps because if they did not they would 'get stuck talking to other people instead of listening' indicating their focus and engagement in the learning process would be negatively affected.

Engagement and Connection Perceptions

Students were also asked to self-reflect on the extent they felt engaged and connected during the course. Figure 2 provides the means and standard deviations of students' responses to the survey questions.

INSERT FIGURE 2 HERE

A chi-square test ($\alpha = 0.05$) was used to assess any significant difference in student responses in regard to the survey questions. The chi-square test was statistically significant for each question with $\chi^2 (1, N = 29) = 8.48$, $p = 0.004$ for both engaged in the learning process and connected to university. As an index of effect size, Cohen's w was > 0.5 which is considered large.

Student Mindfulness Self-Perceptions

In the last session of weeks 1-3 students were asked to consider how engaged they had been, on average, that week. Students' perceptions of their in-class engagement remained consistent through the course (see Figure 3).

INSERT FIGURE 3 HERE

Students in the focus group were asked why they thought the class engagement averages remained relatively high each week (80%, 75%, 74%). They attributed this, partly, to the in-class dynamics and connecting with other students 'I think we were all working together on the group activity so that is why our focus remained high' (FG3). Another student (FG5) said, 'the group dynamic helped, we connected and felt part of something.'

Students also felt that being mindful of accessing technology assisted them to be engaged and connected in the classroom processes, with one student commenting 'turning my phone off at the beginning of class helped me to be more involved in class activities' (FG1). In addition, having the instructor address the importance of being mindful of technology regulation released students from any perceived peer-pressure.

'Acknowledging that we were being distracted gave us the chance to reset and getting that okay to reset was nice coming from someone, because sometimes you don't want to give it to yourself but when someone says, okay you are allowed to reset, the pressure is off you.' (FG1)

These student comments support the quantitative data in Figures 1, 2 and 3. Encouraging students to be mindful of, and to regulate their technology access, enabled them to engage in the learning activities and connect with their classmates. It suggests that the short discussions each week may have provided an opportunity for students to re-focus and maintain a high level of engagement throughout the course.

Discussion

This study investigated the implementation of two mindfulness interventions to assess their influence on student engagement. Student engagement was analysed firstly

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through student interest in the interventions in the classroom; secondly, the link between engagement and feeling connected at university; and lastly, students' level of focus in the classroom. Quantitative data were supported by qualitative student comments. Findings indicate a significant number of students enjoyed the learning process, and felt engaged and connected to people at university during the course. In addition, most students indicated a significant interest in the interventions throughout the course.

The evidence presented in the mindfulness video convinced students they had the ability to improve their level of focus through mindful self-regulation. Students acknowledged the intervention video gave them confidence that through mindful practice, their ability to focus could improve. This change in mindset is an adaptive reaction which helps to "increase the effectiveness of one's method of learning" (Zimmerman, 2002, p. 68). The mindfulness discussion intervention encouraged students to implement strategies to decrease the potential for their devices to distract. This is an attention-focusing strategy related to Zimmerman's (2002) performance phase of self-regulation.

The interventions explicitly addressed the importance of students' self-regulating their behaviour in regard to their use of technology in the classroom in order to enhance student engagement and connectedness. Data reveal a positive significant correlation in students' interest in the interventions. This finding implies that explicitly discussing the importance of regulating technology when not required, for in-class activities, may foster multitasking regulation behaviours, an outcome identified by other researchers (Cheever et al., 2018).

Qualitative data collected related to Zimmerman's self-reflection phase of self-regulation. Students reflected that their technology was a distraction but it was easier to abstain if their peers were also not accessing their phones. This indicates, as Adorjan

and Ricciardelli (2021) suggest, that part of students' multitasking behaviour is associated with "peer perceptions, judgments, and one's reputation within their peer groups" (p. 55). Therefore, by openly discussing the repercussions of undertaking off-task multitasking, they were given a 'chance to reset'. Having the instructor encourage them to self-regulate was nice as it took the pressure off the student and any perceived judgement from other classmates in terms of technology access.

The multitasking discussions align with a critical realism view as reminding students to be mindful of their technology access was, in critical realism, the mechanism used. While the mechanism (intervention) may not guarantee engagement, it has the potential to impact on students' ability to engage. The discussion intervention endorsed a class culture that permitted and encouraged students to put aside their devices to promote focus, connectedness and engagement within the learning environment.

Data on students' perceptions of their feelings of being engaged and connected showed a significant number of students felt engaged and connected during the course. Feeling connected within the learning environment influences student engagement (Picton et al., 2018). When students are mindful of their technology regulation, they are more focused on what is happening in their current environment and are more likely to engage and connect with the instructor and other students, creating a feedback loop that further fosters engagement. The sense of engagement and connection with others comes out in students' comments, such as 'we were all focused and involved' and 'we were all part of something.' Students are not seeing themselves as a single entity but part of something bigger. This sense of belonging positively impacts students' engagement (Kahu & Nelson, 2018).

It needs to be acknowledged that distancing themselves from their technology is not always an easy process for students. Some students conceded that they found the

process difficult. Despite this, most agreed that when they removed their devices, they were less distracted and more present and engaged compared to previous courses where in-class technology was not regulated.

A few students disagreed with the concept of putting their technology away as they said they used it in-class for tasks such as taking notes. However, research investigating the use of laptops to take notes highlights that students who utilised their laptops during class engaged in more media multitasking activities and recalled less class content (Jamet et al., 2020). In a flipped classroom, all content is online for students to access pre and post class. The premise of the flipped approach is that students come to class prepared to participate in an active leaning environment. Therefore, during group activities that did not require technology, students were encouraged to engage in the activity rather than access their devices. The majority of students agreed that through regulating their devices they were more involved in class activities and felt connected to the students they worked with.

The self-perceived mindfulness data, calculated at the end of weeks one-to-three indicated students maintained their sense of focus within the class during the course. The results could question the effectiveness of the interventions as students' mindfulness did not increase during the course. However, student responses, inferring they were engaged in the teaching and learning activities, insinuate they were regulating their use of technology and were engaged in class activities. The authors assert that in the absence of interventions, students' cognitive and behavioural focus throughout the course would have decreased, as has been observed by Boulton et al. (2019). They investigated 175 undergraduate students' engagement during a 12-week semester and noticed engagement levels decreased as the course progressed. In addition, Cao and Tian (2020) found that the use of social media in-class negatively impacted on

collaborative learning, supporting the premise that a lack of interventions may have resulted in a decrease in student and task engagement.

Limitations

Our study had several limitations, the first is an absence of a control group. Further research with a control group would assist to make the impact of the interventions clearer. However, it is encouraging that student engagement levels remained stable throughout the course. In line with critical realism, the data, in conjunction with students' comments, suggest that the mindfulness interventions helped students to regulate their use of technology in-class which led to them being more engaged and connected in the learning environment. The research strengthens the belief that implementing mindfulness interventions which enhance self-regulation (Langer & Ngnoumen, 2017) should be integrated into the teaching process. While a control group may help validate the positive results, the authors recognise that each student has a different journey and what triggers engagement in one may not in another (Kahu et al., 2020). Therefore, reflecting critical realism theory, participants in a control group may show similar results, but engagement is activated by a different mechanism. It is through the student voice that the "unseen forces that trigger change" (Sturgiss & Clark, 2020, p. 144) can be identified.

Secondly, although the mindfulness interventions showed statistically significant results, the small number of participants, a constraint of the block model, may affect variability. Research on larger cohorts would be beneficial. Additionally, the course duration was four weeks, within one discipline in one university which decreases its generalizability. Thus, further investigations over a longer duration and in other disciplines are needed.

Conclusion

Despite the limitations the data has implications for curriculum designers and classroom instructors. The authors support Villena-Martínez et al.'s (2021) statement that there need to be changes in teaching methodologies so technology is used to encourage learning. The current results indicate that mindfulness interventions integrated into classroom practice can assist student engagement through students' regulating technology in-class, and the interventions do not need to be lengthy to have positive results. Although instructors may assume that HE students should already possess self-regulation strategies, this is not always the reality. Compared to secondary school, HE students experience a greater level of autonomy as attendance is not normally required and there are few external regulations on their learning processes (Bieshuizen & Steffens, 2011). This environmental change means there is a greater need for HE to focus on self-regulation strategies, especially in the first year of study. Therefore, curriculum designers should consider implementing interventions within the curriculum that explicitly highlight the positive and negative outcomes that using technology in-class can have on social and academic engagement.

Explicitly discussing the usefulness and disadvantages of accessing technology in-class, in terms of being focused, connected and engaged in the classroom environment provides students with the 'why' behind requests to abstain from technology and puts all students on a level platform, technology-wise. This frees students from potential anxiety from perceived peer judgements, as no one is accessing their technology. Instructors should consider that GenZ students are open to being given boundaries within the classroom environment and many may welcome the instructor implementing these boundaries as they adjust to their university environment.

Focusing on mindfulness in order to encourage self-regulation and enhance engagement, in a classroom environment means a change in class culture. We suggest that having not only a classroom, but also a university culture that encourages and develops self-regulation, social connectedness and engagement could assist with retention and completion rates, important to all universities.

Student comments touched on the psychological effect, from perceived peer judgement, that students experience when they are not able to access their technology. Although this was not a focus of the current research, it is an area that warrants more in-depth investigation. The technology discussions identified that GenZ students can, and have, reflected that their devices are the main distraction for them in class. The data show that when students are aware of the negative effects of multitasking on concentration and engagement, they are more likely to regulate their multitasking behaviour. The authors propose it is the role of the class instructor to provide a balanced perspective around in-class use of technology using Zimmerman's (2002) self-regulation model.

Disclosure statement: The authors report there are no competing interests to declare.

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