Teaching Mindfulness Online

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Abstract

This article outlines the design and delivery of sessions used and the results obtained from a 2016 pilot study investigating whether the use of mindfulness-based techniques could enhance the wellbeing and academic performance of university students. The study, a collaboration between counselling and chaplaincy at Charles Sturt University (CSU) had three aims: (1) to determine benchmark data of wellbeing, focused attention and academic motivation across the CSU student population; (2) to determine whether mindfulness training affected the emotional wellbeing, focused attention and academic performance of higher education students; and (3) because around 60% of CSU students study online, to examine the relative contribution of two different online modes for delivering mindfulness training, one in real time and one self-guided. Based on research that supports the assumption that 'mindful learning' benefits students by enhancing their cognitive and socio-emotional capabilities and improving their general wellbeing and academic performance, this study used three validated psychometric scales to measure the attention and awareness, wellbeing and academic motivation of the participants before and after a four week mindfulness training course. The results demonstrated three main findings: mindfulness training may contribute in the long-term to creating a mindset conducive to learning; mindfulness training can be successfully administered online, both in real time and self-guided; and mindfulness training may contribute to shifting patterns of motivation for learning from extrinsic to intrinsic motivation.

Keywords

Attention, teaching mindfulness, motivation, student wellbeing, online, distance

Background

Mental health issues in university students are of significant concern. Psychological distress has been associated with low academic achievements and high attrition rates (Andrews & Wilding, 2004; Stallman, 2010; Szulecka, Springett, & De Pauw, 1987) and several Australian studies have shown significantly higher levels of distress and mental illness in student populations than in the general population (Cvetkovski, Reavley, & Jorm, 2012; Stallman, 2008; 2010). A recent European study found that, within the sample used, one in two PhD students experienced psychological distress, with one in three at risk of common psychiatric disorders (Levecque, Anseel, De Beuckelaer, Van der Heyden, & Gisle, 2017). There is evidence that these problems are increasing (Belfer, 2008; Schonert-Reichl & Lawlor, 2010), with university student health services recording increasing numbers of students seeking consultations for diagnosed mental health problems (Andrews & Wilding, 2004), regardless of culture (Giel et al., 1981) or socio-economic status (Kieling et al., 2011).

In response, many universities are developing strategies designed to improve student mental health (Greenberg et al., 2003). They are paying particular attention to mindfulness because there is increasing evidence that 'mindful learning' addresses student mental health and general coping abilities (Collard, Avny, & Boniwelly, 2008; Hassed, de Lisle, Sullivan, & Pier, 2009; Kang, Choi, & Ryu, 2009; Lynch, Gander, Kohls, Kudielka, & Walach, 2011), and also enhances students' cognitive and socio-emotional capabilities and improves their general well-being and academic performance (Hassed & Chambers, 2014; McCloskey, 2015; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013; Ritchhart & Perkins, 2000; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). A number of Australian universities (such as Monash University, the Australian National University and the University of South Australia) are thus offering mindfulness programs to help students both with stress management and to develop cognitive strategies to enhance academic performance (Hassed & Chambers, 2014). A wide variety of online resources are also available (e.g. the Australian

'Smiling Mind' (n.d). website).

Mindfulness has been defined as 'paying attention in a particular way: on purpose, in the present moment, and non-judgementally' (Kabat-Zinn, 1994, p. 4). Originating from the Hindu and Buddhist traditions, it is a form of mental training that improves the ability to raise awareness levels and to direct attention intentionally (Johannes, 2012). As such, it does not need to be set within a particular religious tradition, and can readily be used by people who practise other religious traditions, such as Judaism (Gefen, 2011, p. 110) and Christianity (Symington & Symington, 2012; Trammel, 2015) or as a secular practice. The program outlined in this paper was presented to participants as a secular practice, but with information about its use in religious traditions.

Hassed and Chambers (2014) argue that when mindfulness is not presented in ways that are clear, practical and relevant, it does not lead to the long-term engagement that is necessary for long-term benefits. They also argue for the need to promote mindfulness in an evidence-based way. The principles of clarity, practicality and relevance informed the development and delivery of this program. Wherever it was possible to do so, the program provided the evidence and rationale for the content and the recommended practices.

Goretzki and Zysk's (2017) study of the University of South Australia's three-week, face-to-face mindfulness program provided an analysis of student evaluation feedback on the program over a three-year period. The feedback consistently indicated significant improvements in participants' capacity to manage stress and maintain focus. Complementing this, and in recognition of the fact that the majority of Australian universities now offer some online learning components in their courses (University Rankings, n.d.), this study looks at the outcomes from providing a mindfulness program delivered entirely online (compared with face-to-face delivery). A four-week course was designed and developed in two online modes: one offering four 90 minute real-time sessions in the early evening with material presented by a tutor, and one which presented the same material as a largely text-based self-guided online course to be followed over four weeks. Both also encouraged participants to do regular, ideally daily, practice between teaching sessions. The analysis used three validated psychological scales in addition to participant feedback.

While the scope of this pilot study made it impossible to measure academic success directly, it was possible to investigate whether mindfulness training could benefit students in three areas known to contribute to academic success:

- Wellbeing, including managing stress
- Ability to pay attention in the here and now (mindful attention) and
- Academic motivation.

This paper reports on the results in relation to the first two of these aims. Although some promising results were found in relation to academic motivation, the sample size was too small to provide definitive information and it is beyond the scope of this paper to report these findings.

The Charles Sturt University context

Charles Sturt University (CSU) is a regionally based university with approximately 30% of its students studying face-to-face on six main campuses and the remainder studying online (by distance) or mixed mode (part face-to-face, part online). In 2017, approximately 21% came from low socio-economic backgrounds and 68% were the first in their family to attend university. Anecdotal evidence suggests that a relatively high proportion of its students study part time whilst in full-time or part-time employment and/or with family care responsibilities, although the university does not collect

these figures. Some students fall into all these categories.

In Australia all tertiary institutions charge students a government-sanctioned compulsory Student Support and Amenities Fee (SSAF). The Federal Government has specified 19 areas in which these fees can be spent by universities. In 2015 the CSU SSAF Steering Committee surveyed its students to determine which of the 19 areas were considered most important by students, in terms of how SSAF funding should be used. Developing study skills and providing health and welfare services were amongst the top five priorities. In 2016, the Office for Students obtained SSAF funding for a pilot project to investigate whether levels of well-being, focused attention and academic motivation changed after an intervention of mindfulness training, examining, in particular, the relative contribution of two different online modes for delivering mindfulness training outlined above. In addition, it aimed to determine benchmark data for levels of wellbeing and academic motivation within a sample of the population of students at CSU.

The mindfulness training

Development of the course

In recognition of the developing literature about the effectiveness of mindfulness, sessions have been offered in various formats and iterations for students and/or staff across the various campuses of the University over a number of years. Notably, the Faculty of Business, Justice and Behavioural Science has funded mindfulness programs for academic and professional staff and these programs have been shown to help participants cope with work-related stress and anxiety, as well as improving job satisfaction (Wongtongkam, Krivokapic-Skoko, Duncan, & Bellio, 2017). At the time of writing this paper, the University Human Resources (HR) division was funding lunch-time mindfulness sessions for University staff. Some members of the academic staff were also embedding mindfulness practices into subjects, particularly those that focused on professional practice, reflection and self-care (for example, in undergraduate nursing subjects). A Graduate Certificate in Applied Mindfulness has been developed, with enrolments commencing in 2018. One of the authors of this paper (Simmons) had devised and conducted several previous iterations of this training based on the Monash University Mindfulness for Academic Success program (Health and Wellbeing, Monash University, 2017; Dobkin & Hassed, 2016). They were delivered online via real-time meetings, with students recruited on a small scale. During these previous iterations there had been little organisational support or interest for the program and, while there was some evaluation of student satisfaction, there was no attempt to research the outcomes of students who participated. In addition, none of these offerings involved a scalable program accessible to both online and internal student populations and with an explicit focus on enhancing skills for improved wellbeing and academic performance.

The call to staff to submit for SSAF funding offered an opportunity to seek funding to undertake a properly resourced research project. The funding from the SSAF program was directed towards the research aspect of the project, rather than content delivery. All content development work occurred within the duties of the existing Student Counsellor role (one full-time position).

Content overview

A four-week program called Mindfulness for Wellbeing and Academic Success (MWAS) was developed and delivered in the two modes described – self-guided online and in real-time sessions.

Table 1 presents an overview of the four- week program:

Table 1. Mindfulness program overview

Week One Content	Week One Practices
Week One Content Introduction to mindfulness, thoughts and awareness, how we learn mindfulness, making a commitment to practice.	**Week One Practices** Three-minute Breathing Space (everyday mindfulness), Using the Breath as an Anchor (guided mindfulness practice)
Week Two Content Default mode brain function, negativity bias, responding to negative emotions mindfully.	**Week Two Practices** Three-minute Breathing Space (everyday mindfulness), Thoughts and Feelings as Waves (guided mindfulness practice)
Week Three Content Attention, training attention, dealing with distractions, multitasking, stress and performance, applied mindfulness, procrastination.	**Week Three Practices** Mindfulness Bells (everyday mindfulness), Body Scan and Mindful Movement (guided mindfulness practices)
Week Four Content Being intentional, ethics, values and spirituality, maintaining motivation, finding teachers, wellbeing and positive psychology, using apps for guided meditation.	**Week Four Practices** Befriending Meditation (guided mindfulness practice) and practice of participants' choice.

Challenges

Timing challenges

Sessions were scheduled for times when participants would be less likely to be already overloaded with coursework demands, preparation for exams and so on. The length of the program was partly determined by available time frames and constrained by the fact that academic sessions at CSU are 12 weeks in duration, which leads to content-heavy subjects and tight timeframes for students to complete assessment tasks. There are also session breaks to be navigated. The final four weeks of academic session were avoided, to allow students to focus fully on their studies at that time.

Because of this, students arrived at the end-point of the program after only three weeks of practice, so opportunity for reflection and feedback on the practices in week four was severely limited. However, a number of studies have demonstrated the effectiveness of brief (two- to four-weeks' duration) mindfulness training programs for university students (Zeidan et al., 2010, Mrazek et al., 2013, Goretzki and Zysk, 2017)

Limits to presenters' expertise with online platforms

The authors had limited experience in formal teaching, although they had experience in training, mainly consisting of ad-hoc presentations to students and/or staff members. They also had little prior experience or expertise with online content platforms (CSU uses BlackBoard, branded as Interact2), other than limited experience with AdobeConnect online meetings. Academic content developers were therefore engaged to assist with putting content online for the self-guided version of the program. Even so, the content was presented in a way that did not take full advantage of the interactivity possibilities afforded by the online platform. This could be improved in future offerings.

Teaching mindfulness

A major challenge was to devise a coherent learning trajectory for participants seeking to learn mindfulness in a scaffolded way. The final content for the program included elements from the Monash University Mindfulness for Academic Success program (Hassed & Chambers, 2014), Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn, 1990), Mindfulness integrated Cognitive Behaviour Therapy (MiCBT; Cayoun, 2011), Mindfulness Based Cognitive Behaviour Therapy (MBCT; Segal, Williams, & Teasdale, 2002) and Mindfulness: An Eight Week Program for Finding Peace in a Frantic World (Williams & Penman, 2011).

Among these different approaches to teaching mindfulness, several features stand out as being

particularly important in developing a graduated learning pathway for participants:

1. Duration: beginning with practices of shorter duration and graduating to longer practices.

2. Density or frequency of instruction: 'Density' refers to frequency of instructions within specific mindfulness practices. More basic practices provide more instruction to participants, with shorter gaps between the delivery of instructions. More advanced practices can have fewer instructions and longer spaces for participants to engage with the practice in silence.

3. Type or object of focus: Another dimension of scaffolding or increasing challenge for participants is the type of focus that the practices employ. It appears to be useful to use practices which engage a variety of sensory modes as a focus for attention, including, for example, body sensations, mindful eating and mindful movement. Nearly all the mindfulness programs examined use these. Different participants tend to engage more strongly with different activities; for example, some may engage more strongly when the focus is on body sensations (body scan activities), while others may prefer mindful eating, or mindful movement activities (such as 'mindful standing yoga' in MBSR training). Through the use of such activities, participants are helped to move from a clearly defined focus (say, the breath) towards a more open – truly mindful – undirected awareness of experiences unfolding moment by moment.

4. Acceptance: This relates to when it is most helpful to transition from teaching the skills of 'bare attention' (Kabat-Zinn, 1982) – the focusing element of mindfulness – to self-compassion, the other important component of mindfulness, which allows participants to remain open to unpleasant experiences that inevitably arise in their awareness at times, without judgement or the tendency to draw away from these experiences. Withdrawal can happen in a variety of ways – such as abandonment of practice due to agitation and restlessness, boredom or sleepiness. Acceptance is an essential part of the training and needs to be introduced early in the process, at least briefly, then elaborated and expanded upon later in the program.

5. Teacher-student relationship: Many traditions use a kind of 'master-apprentice' approach that emphasises the teacher-student relationship as the focus for the transmission of learning. A more technical or technological approach, where techniques and skills can be articulated in a more instrumental way is less dependent on the teacher-student relationship. The latter is clearly more acceptable and appropriate to a modern, secular environment such as this one, where we are offering university students a chance to learn skills to enhance their wellbeing and academic performance.

The importance of practice

The well-established principle followed within the program, was that, above all, mindfulness arises from direct experience and as a result of practice, rather than purely from description or instruction, although those things are necessary (Crane et al., 2012, p. 32; Segal, Williams & Teasdale, 2002). Therefore, there was a heavy emphasis on the importance of practice; a number of resources were developed to assist and support participants' practice and to trouble-shoot when the inevitable problems arose for them. Participants were encouraged to commit to practising each week's exercises as close to daily as possible for the duration of the course.

Placing mindfulness in the learning context

A challenge was to include a practice that would place mindfulness squarely in the context of being a student and would allow participants to explore for themselves how mindfulness might be usefully employed 'on the run' while they are striving to focus and direct their attention to a study task. An activity that forms part of the Mindfulness for Academic Success Program at Monash University (Hassed and Chambers, 2014) was therefore used. It involves selecting a task to perform, from three different options – a Sudoku task, a spot-the-difference task and a brief reading comprehension task. Participants first cultivate mindfulness, then undertake the task of their choosing, in mindfulness, and simultaneously reflect and write down their unfolding experiences (thoughts, feelings, distractions and so on) in real time. Describing this task adequately for self-guided participants was a particular challenge. Even for the real-time participant groups, it was a challenge to understand the experiences that individual participants were having and whether they were able to undertake the task in the intended way, and gain some insight or benefit from it.

Limits to participants' opportunities for reflection, sharing and feedback

Another challenge in the design and delivery of this program was designing opportunities for participants to reflect on, seek feedback and learn from the experiences that arose in the practices – a crucially important task. Goretzki and Zysk (2017) note the benefits that accrue from a group program focusing on knowledge acquisition and skills development. For purely practical reasons, this needs to be handled differently in the online environment than in a typical group or classroom learning environment.

The real-time sessions were structured so that there was an opportunity for participants to share and discuss experiences from the previous week's practices early on in each session. However, minimal discussion ensued. Although the AdobeConnect room was set up and managed so that participants could use a microphone where one was available, all of the discussion that occurred happened in the text-based 'chat' feature. Unfortunately, the resultant lack of verbal discussion diminished this element of the program, hence feedback on experiences and difficulties arising during practices was more limited than it might have otherwise been.

In an online learning environment collaboration is typically encouraged using online discussion forums, so forums were set up within the program for both delivery methods (self-guided and real-time participants). However, engagement in this aspect of the program was low. One contributing factor to this may have been that although project team members recognised discussion amongst participants as being an important aspect of the program, they found it difficult to generate this via the forums, due to lack of dedicated staff time allocated. As previously mentioned, the program development was undertaken while normal work commitments and expectations remained in place, which was a serious limitation, timewise. Despite this, attempts were made to encourage discussion, but most participant activity consisted of requests for help with technical issues. While there is minimal attention to this in the literature, discussion with experienced online teaching academics at a number of universities also suggests that low engagement is normal for activities that are non-assessable components of a course, so it is unclear whether this could be changed in a course that does not involve credit points.

Despite the limitations mentioned, statistically significant improvements were seen for participants in both groups (real-time and self-guided), in mental wellbeing (WEMWBS), mindful attention (MAAS) and, with some qualifications, academic motivation (AMS).

The research

The research was conducted in two stages and participants could take part in either stage one only or

both stage one and stage two. Stage one was for benchmarking; students were asked to complete three self-report questionnaires and provide some demographic and general background information to enable the authors to assess the general levels of wellbeing, academic motivation and mindful awareness in the student population. The questionnaires used were the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Stewart-Brown & Janmohamed, 2008), the Mindfulness Awareness Scale (MASS; Brown & Ryan, 2003; Stewart-Brown & Janmohamed, 2008) and the Academic Motivation Scale (AMS; Vallerand, Blais, Briere, & Pelletier, 1992).

Stage two involved participating in the four-week mindfulness training program outlined above and completing the same questionnaires, together with the standard participant satisfaction questionnaire given to everyone who attends activities run by the CSU counselling service. This enabled evaluation of whether participating in the program resulted in changed levels of wellbeing, motivation and mindfulness awareness. It also provided feedback about the course delivery.

The scales

The WEMWBS (Stewart-Brown & Janmohamed, 2008) scale is a 14 item self-report questionnaire used to measure participants' wellbeing. It looks at two perspectives of mental wellbeing: the subjective experience of happiness and life satisfaction; and psychological functioning in the domains of autonomy, self-acceptance, environmental mastery, personal growth and positive relations with others. The minimum score of 14 is the lowest level of wellbeing and the maximum score of 70 is the highest level of wellbeing.

The MAAS (Brown & Ryan, 2003) is a validated 15 item self-report questionnaire that was used in this study to measure students' levels of attention and awareness. Low scores (>1 and <3) indicate little attention to, or awareness of the individual's present-moment experience. High scores (≥3) indicate an overall ability to experience everyday life and activity with high awareness and mindful attention.

The AMS (Vallerand et al., 1992) is a 28 item validated self-reporting questionnaire. The wording was slightly adjusted to suit the Australian context. It measures seven types (seven subscales) of constructs related to motivation.

Recruitment

After the researchers obtained approval from the university's Human Research Ethics Committee, students received official email invitations to participate in the voluntary study, which was also advertised on the university website and through the use of posters. Any student aged 18 years or over, enrolled in any course, location or mode, was eligible to participate. Each was provided with a link to a SurveyMonkey site which contained the participant information sheet (PIS) and consent form. Once they had clicked on the 'consent to participate' button, they were taken to the first iteration of the three questionnaires and the demographic questionnaire. After completing the first set of questionnaires, participants could choose to go no further or to enrol in either the self-guided mindfulness course through Interact2, CSU's Blackboard-based Learning Management System, or one of two real-time presentations of the course using AdobeConnect. Those who only wanted to participate in the first stage could choose to be totally anonymous, while those who wanted to continue to stage two needed to provide a nickname so that we could match their pre- and post-participation scores on the questionnaires. At the end of stage one, participants were given general information about the significance of particular kinds of responses to the questionnaires, together with information about where to find resources to improve their wellbeing and academic motivation. At the end of stage two, participants were able to receive individual feedback about their scores.

Study design

The stage one data were designed to provide benchmarking information about the well-being levels of the CSU student population, to determine how representative participants were. In stage two, two designs were used to investigate the main effect of time (i.e. pre- and post-training), the main effect of mode of training, (i.e. real-time versus self-guided), and any interaction between mode of training and time. The aim was to determine whether participating in a 4 weeks' mindfulness training-program resulted in changed levels of wellbeing and focused attention and whether the mode of delivery had any effect. The mode of delivery is of interest because internal CSU statistics show that many of CSU's online students prefer to access support services outside normal office hours. For example, since the staff working within Academic Literacy, Learning and Numeracy began offering workshops outside office hours in 2016, approximately 42% of participants have attended weekend options. Staff report that the six o'clock to seven o'clock evening weekday timeslots are also popular, but no separate figures are available for these. The ability to provide effective self-guided online participation has significant (positive) resource implications for the University student support services, in that it would allow courses to be delivered to many students without taking counsellors' time away from other tasks. The second design looked at motivation, including any changes between type of motivation that participants experienced in the four weeks of the course. All statistical analyses were conducted using SPSS version 22 (Allen, Bennet, & Heritage, 2014). The significance for all parametric tests used was set at α=.05 and assumptions of normality and homogeneity of variance tested.

Results of the statistical analysis

Stage 1:The benchmarking data`

Of the 609 students who returned pre-training surveys (Stage 1), 589 provided a complete set of answers; these were 448 females (76% - compared with general enrolment figures of 69%), 136 males (23% - general enrolment = 31%) and five participants who preferred not to specify their gender (1%) with a mean age of 36 years (SD±11.7). Of these, 33% were enrolled full-time (general enrolment = 39%) and 67% part-time (general enrolment = 61%); 73% were studying externally, online (general enrolment = 60%), 23% were studying on campus (general enrolment = 30%) and 4% were studying in a blended mode of some on-campus attendance combined with external online study (general enrolment = 11%). These statistics indicated that the participating sample was similar to the general makeup of CSU students, although online students and female students were somewhat over-represented. The over-representation of females within the stage one sample matches the current participation trend in mindfulness training courses around the world, with the literature indicating that it is not clear why this is so (Hattori, 2013). The over-representation of online students was not problematic, given that a major concern of the research was the ability to deliver effective mindfulness courses to this cohort.

Stage 2a: Comparison of pre- and post-training scores on the three questionnaires

Two hundred and sixty-two students, 44% of those who completed stage one, signed up to participate in stage two. Of these, 74 chose to follow the online training in real time while 188 chose the self-guided mode of delivery. Seventy-one of the participants, representing 26% of those who had enrolled in the real-time sessions and 28% of those enrolled in the self-guided mode, provided sufficient feedback to enable matching of pre- and post-training data. These response rates are slightly better than the 21% that Sax et al. (2003) reported for other studies using web-surveys with students. The study controlled for variables of adverse life events, exercise and previous mindfulness experience. Effect sizes were correlated with levels of engagement with the mindfulness practices, as reported by participants.

Post-training scores on the WEMWBS significantly increased from pre- to post-training ($F(1,69)=13.38$, $p<0.001$) suggesting a positive effect of the mindfulness-training on general wellbeing. Similarly, the mindful attention (MAAS) scores were significantly higher than pre-training scores ($F(1,69)=19.65$, $p<0.001$), suggesting a positive effect of the mindfulness-training on ability to stay focused and aware. Overall, 62% of participants showed an improvement on the scores of the WEMWBS wellbeing scale and 75% on the scores of the MAAS scale. Scores on the WEMWBS ($F(2,728)=3.56$, $p=0.029$) and the MAAS ($F(2,728)=7.94$, $p<0.001$) were statistically significantly higher than benchmark-scores of the general CSU population of students who participated in stage one.

Analysis of the motivation scores was more complex and, while detailed discussion of this is beyond the scope of this paper, it is intended that this will form the subject of a future publication. Of particular interest was that while, as expected, the younger participants started with relatively higher levels of extrinsic motivation and lower levels of intrinsic motivation than the older participants, by the end of the program younger participants were reporting a decrease in their extrinsic motivation and an increase in their intrinsic motivation. This is an encouraging outcome because the literature indicates that higher intrinsic motivation levels are associated with better academic achievement (see, for example, Walker, Greene & Mansell, 2006).

Stage 2b: Comparison between the two modes of delivery

As noted above, post-training scores on the mindful attention and well-being questionnaires were significantly higher than pre-training scores. Importantly, there was no significant difference between the two mindfulness training groups (self-guided and real-time) in the scores for any of the three questionnaires, pre- and post-training, suggesting positive effects regardless of the mode of training delivery. These results should be treated with caution, however, because the sample sizes of the groups that were compared were not large enough to provide a high statistical power. Although prior experience of working in these environments indicated that there might be a higher drop-out rate in the self-guided group, there was no significant difference in drop-out rates between the two groups.

Stage 2c: Overview of the results of participant satisfaction surveys

The results of the participant satisfaction surveys were overwhelmingly positive. Ninety percent of participants agreed or strongly agreed that the resources were useful, with: 91.5% agreeing or strongly agreeing that the information provided was relevant to them; 71.5% agreeing or strongly agreeing that they felt confident about applying the skills they had learned; 74.3% agreeing or strongly agreeing that the program had been beneficial; 82.9% agreeing or strongly agreeing that they knew where to find further information and resources; and 91.5% agreeing or strongly agreeing that they would recommend the program to other students. The remaining responses to each question were mostly neutral, with the highest disagreement score being that 7.1% of participants were not confident that they could apply the new skills they had learned.

Discussion

As reported in the statistical analysis section, participation in the MWAS training program appeared to lead to significant improvements in all of the three dimensions that were investigated: mental wellbeing, mindful attention and academic motivation (as measured by three scales: the Warwick Edinburgh Mental Wellbeing Scale, the Mindful Attention and Awareness Scale and the Academic Motivation Scale, respectively).

Given the continuing growth in online study in higher education, the finding that improvements in all three dimensions were seen in both the real-time group and the self-guided group, is important. The results suggest a way for support services to meet the challenge of providing effective strategies to

assist online students to maintain wellbeing, focussed attention and effective motivation for their studies. There were limitations on the statistical power of some findings, due to sample sizes, but overall findings were robust.

The observed changes in extrinsic versus intrinsic motivation in the younger cohort of participants suggest that these practices may be particularly beneficial for younger students. This is particularly important as it has become widely recognised that motivational and cognitive factors interact to influence students' academic success (Pintrich & Schunk, 2002).

A note on attrition

In the study overall, 67% of participants who signed up for the training failed to submit the final questionnaires, 70% of those in the two real-time groups and 65% of those in the self-guided group. These figures include participants who signed up but did not actually begin the training (29, or 15%, in the on-line group and 20, or 27%, across the two AdobeConnect groups), those who started the training but left along the way, and those who may have completed the training but not the final questionnaire. There was no way of differentiating between the latter two groups. The study design did not allow investigation of this outcome, although some of the participants in the real-time training groups did communicate their reasons for leaving the training. Reasons included unforeseen additional time challenges and life events arising during the training. Anecdotal evidence suggests that high drop-out rates are common in online training offerings which do not bear credit points and do not form part of students' degree courses, and our attrition figures are significantly better than the less-than-13% completion rates generally reported for MOOCs, which offer certificates for satisfactory completion (Onah, Sinclair & Boyatt, 2014), even for five and seven week short courses (MOOCs at Edinburgh Group, 2013).

Perhaps of more importance is the effect of the experience of learning mindfulness on these participants, and what, if any, conclusions they have reached for themselves regarding their capacity or willingness to continue practising mindfulness in the future. It would be unfortunate if these participants found that some aspect of their experience of mindfulness was negative and did not have the chance to process this or gain feedback from the instructors, something that is less likely to happen in face-to-face courses.

For further investigation

A number of issues would merit further investigation. First, it would be useful to follow participants over a longer period to see whether and for how long the benefits lasted and under what conditions. Second, a larger sample size with a more balanced age distribution would enable better data to be gathered on the effect of mindfulness on motivation. It should also be noted that the improvements that students in our study reported in focused attention and wellbeing after the mindfulness training paralleled the common relationship found between mindfulness training and wellbeing (see, for example, Carmody & Baer, 2008), but are still correlational, rather than demonstrating a causal relationship.

Conclusion

Participants in the MWAS program appeared to experience improvements in mental wellbeing, mindfulness and academic motivation, but there is room for further development of these research findings. In particular, we know that mindfulness training works best when teachers/facilitators can help students to connect their learning with their own experiences (Crane et al., 2012, p. 32). This requires opportunities for teacher-learner engagement and feedback. Possibilities for further research are being pursued, with the intention that future iterations of MWAS will involve enhanced opportunities for interaction during (and after) mindfulness training for the significant

online learning student population at CSU. It seems highly likely that these results are transferrable to other universities with high numbers of online and mixed-mode students since, at least in Australia, all universities that teach online use Learner Management Systems with the same kinds of facilities.

Acknowledgements

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