Exploring the Impact of an Open Access Mindfulness Course with Online Graduate Students: A Mixed Methods Explanatory Sequential Study

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Abstract

As enrollment in online graduate education increases, retention continues to be problematic for many colleges and universities across the United States. Non-traditional students, who represent the majority of online graduate student enrollment, have unique issues related to persistence considering they often must juggle the demands of graduate school with work and families. The competing demands can lead to increased levels of perceived stress, which can impact academic performance due to increased mind wandering and decreased attention. Mindfulness is a practice that has been shown in the literature to decrease levels of perceived stress and mind wandering, therefore, the integration of mindfulness practice could have a positive effect on student persistence in online graduate education. Therefore, an online open access mindfulness course was created at one large urban university. The purpose of this explanatory sequential study was to explore the impact of teaching mindfulness to online graduate students. Self-report levels of perceived stress and mind wandering were significantly lower after students completed Module One of an open access mindfulness course. Self-reported perceived persistence levels were found to be significantly higher after Module One with students in the first or second quarter of their program, students with little or no mindfulness experience, and students who meditated four or more times a week. Furthermore, students interviewed felt that the course provided excellent foundational information about mindfulness that could be immediately applied, and therefore should be a requirement for all incoming students.

Keywords: mindfulness, stress, online learning, graduate students, open access, mind wandering

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A Mixed Methods Explanatory Sequential Study

Enrollment in online education has continued to grow over the past 17 years (Seaman, Allen, & Seaman, 2018). However, persistence and retention in online programs remains a significant problem for colleges and universities across the United States (Muljana & Luo, 2019). Student persistence is often a challenge with online graduate students, who are typically non-traditional students juggling multiple responsibilities outside of school, including full- or part-time employment and families (Muljana & Luo, 2019; Spadaro & Hunker, 2016). When students do not persist to graduation, they can be left with a significant amount of student debt and no degree. In the United States, student debt is a serious problem, considering there are 44.7 million borrowers with student loan debt who owe $1.56 trillion (Friedman, 2019).

The perceived flexibility of an online program is what draws students to this type of learning (Muljana & Luo, 2019, Sorensen & Donovan, 2017; Zimmerman, 2012). However, research reveals several key obstacles associated with online attrition. Obstacles include structural factors like tuition cost, not being able to balance the demands of school with personal responsibilities, and not receiving institutional support (Sorensen & Donovan, 2017). Additionally, there are obstacles that are psychological in nature, which include levels of stress, poor time management, and learner self-efficacy (Farrington et al., 2012; Stelnicki et al., 2015). Ultimately, to better support students and improve retention, particularly with non-traditional students, it is imperative that colleges and universities provide education, support, and resources so that students can be successful in online programs (Muljana & Luo, 2019). This can include initiatives on how non-traditional students can manage their stress, inside and outside of the classroom.

Providing support to students for how to handle life's stressors is important, as stress can lead to increased mind wandering and decreased focus. *Mind wandering* can be defined as a distraction from an external stimulus to a self-generated thought (Smallwood & Schooler, 2015). Mind wandering can have a negative impact on learning including decreased reading comprehension, attention during lectures, and academic performance (Dixon & Bortolussi, 2013; Farley, Risko, & Kingstone, 2013; Wammes, Seli, Cheyne, Boucher, & Smilek, 2016). Decreased retention in online graduate programs could be partially due to students' stress levels, considering the evidence that increased stress leads to increased mind wandering (Crosswell, Coccia, & Epel, 2019; Smallwood & O'Connor, 2011) and decreased academic performance (Lukasik et al., 2019; Klein & Boals, 2001).

Mindfulness is a practice that has been shown in the literature to decrease levels of perceived stress (Chin, Slutsky, Raye, & Creswell, 2019; Hölzel et al., 2012; Shapiro et al., 2012) and mind wandering (Bennike, Wieghorst, & Kirk, 2017), however, research is lacking on the impact of mindfulness with online graduate students. Additionally, no research could be found on the impact of mindfulness on online graduate student persistence.

Ultimately, persistence for non-traditional students enrolled in graduate education is a challenge due to stress which can decrease attention, increase mind wandering, and affect academic performance; therefore, research is needed on the effects of implementing mindfulness in online graduate programs. An open access mindfulness course and associated mixed methods explanatory sequential study was designed in response to the research gaps. Quantitative data was collected through the use of reliable and valid instruments administered via Qualtrics before and

after participants completed Module One of an open access course titled "Mindfulness and Optimal Performance." The instruments measured levels of perceived stress, mind wandering, and persistence. A total of 31 graduate online students completed Module One and both the pre- and post-surveys. To gather qualitative data regarding students' perception of the course, six of the participants completed a 15-20-minute Zoom interview using a semi-structured interview template.

Review of Relevant Literature

Online Learning

The landscape of higher education has changed considerably since the introduction of online learning (Van Doorn, 2014). As of the Fall of 2016 over six million students were taking at least one online class, comprising 31.6% of all higher education enrollment (Seaman et al., 2018). These numbers represent an overall growth in online learning of 17.2% since the year 2012. Growth in online learning is partially due to the fact that online learning allows students to attend class anywhere, anytime, regardless of location (Van Doorn & Van Doorn, 2014). Additionally, online learning provides the flexibility to allow students to work while attending school (Bawa, 2016; Van Doorn & Van Doorn, 2014). While enrollment in online learning continues to increase, retention continues to be a problem for colleges and universities across the United States (Caruth, 2018). The problem of higher education retention is multifactorial, and the impact can have both short-term and long-term consequences on students and institutions.

Throughout the literature, factors that both support and hinder persistence in higher education have been identified (e.g. Bawa, 2016; Sorensen & Donovan, 2017).

Persistence

Noncognitive factors have been identified to support student persistence. Noncognitive factors include academic behaviors (i.e. participating in coursework), academic perseverance (i.e. grit), academic mindset (i.e. self-efficacy), learning strategies (i.e. study skills), and social skills (i.e. interpersonal skills) (Farrington et al., 2012; Farruggia et al., 2018). Particularly, an academic mindset has been identified as a factor that predicts persistence with higher education students (Farruggia et al., 2018; Stelnicki, Nordstokke, & Saklofske, 2015). To support an academic mindset, a recommendation from the literature is to offer mindfulness education (Caruth, 2018), as mindfulness has been correlated with increased self-efficacy, which is a crucial element of having an academic mindset (Sampl, Maran, & Furtner, 2017).

Factors have also been identified to hinder persistence, including having to balance the demands of school with work and personal obligations, which can lead to stress. (Spadaro & Hunker, 2016). It is known that graduate students experience higher than average stress levels. Specifically, in a study conducted during the Spring of 2017, 59.8% of over 14,000 graduate students surveyed reported experiencing higher than average stress rates (ACHA, 2017). Ultimately, stress can lead to burnout and attrition (McKinney, 2017). In a qualitative study by Stelnicki et al. (2015), the researchers identified that stress was one of the primary reasons students did not reach their academic goals. The researchers hypothesized that stress causes a decrease in attention, which prohibits students from focusing on their academic studies (Stelnicki et al., 2015). These findings reveal the need for colleges and universities to support the entire student, including how to handle life's stressors.

Mindfulness

Mindfulness is a practice that can be used to support students, as mindfulness has been shown in the research to decrease stress (Chin, Slutsky, Raye, & Creswell, 2019; Hölzel et al., 2012; Shapiro et al., 2012) and mind wandering (Bennike et al., 2017; Ju & Lien, 2018; Mrazek et al., 2012). Mindfulness can be defined as intentionally paying attention in the present moment, nonjudgmentally (Kabat-Zinn, 2013; Shapiro et al., 2006). In 1979, Jon Kabat-Zinn created Eight-Week Mindfulness-Based Stress Reduction clinics included both didactic and experiential content (Kabat-Zinn, 2013). Since creating these clinics, the research on mindfulness has exploded. Research shows that by cultivating this type of awareness, one can see changes in their emotional health and cognition (e.g. Bennike et al., 2017; Hölzel et al., 2012; Shapiro et al., 2012; Tang et al., 2007; Vago & Zeidan, 2016).

Perceived Stress. One of the most studied variables in mindfulness research is the impact on levels of perceived stress. The original eight-week mindfulness-based stress reduction (MBSR) course has been correlated with a decrease in levels of perceived stress through extensive research (Hölzel et al., 2010; Janssen, Heerkens, Kuijer, van der Heijden, & Engels, 2018; Shapiro et al., 2012). Research has also linked changes in improvements in perceived stress to structural changes in the brain (Hölzel et al., 2010).

While much of the research does focus on the impact of eight-week MBSR courses, not everyone can attend full courses due to financial and time restraints. Research has also demonstrated the effects of shorter mindfulness training (Economides et al., 2018; Lam, 2015). For example, research has shown that both five-minute meditations for one week (Lam, 2015) and ten days of meditations via the *Headspace* app (Economides et al., 2018) can decrease levels of perceived stress. Overall both studies support using short mindfulness meditations (five to ten minutes in length) to reduce levels of perceived stress, which is important when focusing on online graduate students because they have very little time as they are already juggling work, school, and family, so short mindfulness meditations may fit better into their schedules. Additionally, by introducing students to short mindfulness interventions students may be more inclined to continue practicing so that mindfulness can be fully integrated into their daily routines.

Mind Wandering. In addition to the emotional health outcomes related to mindfulness, research has also focused on mindfulness and mind wandering. Mindfulness practice can help to decrease mind wandering and as a result, studies have shown mindfulness can help to facilitate attention (Bennike et al., 2017; Tang et al., 2007; Vago & Zeidan, 2016). The mindfulness app, *Headspace,* was used in a different study to examine the impact of short mindfulness meditations on levels of mind wandering (Bennike et al., 2017). Mind wandering was indirectly assessed using the Sustained Attention to Response Task (SART) before and after the intervention. After only four weeks of guided mindfulness meditation via the *Headspace* app, researchers found that participants scored significantly better on the Sustained Attention to Response Task (SART) tool than the control group who used the *Luminosity* app. Therefore, the researchers concluded that four weeks of mindfulness training contributed to a decrease in mind wandering.

Mindfulness and Education. Given the research benefits, like decreased mind wandering and stress, mindfulness has become increasingly popular in education. Considering that the mind wanders almost 50% of the time (Killingsworth & Gilbert, 2010), students enrolled in higher education courses may be physically present or actively online, but their minds may be elsewhere. According to Langer (2014), many students are progressing through courses "mindlessly."

Research shows that mindless behaviors, like multi-tasking, reactivity, and denial, can lead to academic failure (Willgens & Sharf, 2015). This "mindlessness" comes from only striving towards an external goal, instead of being intrinsically motivated (Langer, 2014). For example, only striving for an A, as opposed to being motivated to study for the purpose of deep meaningful learning is an example of progressing through courses "mindlessly".

Mindfulness has been implemented in higher education in many ways including using formal eight-week in-person MBSR courses (Song & Lindquist, 2015), online MBSR courses (Sanko, Mckay, & Rogers, 2016; Spadaro & Hunker, 2016), and more informal, short meditation practices (Napora, 2013; Ramsburg & Youmans, 2014; Schwind et al., 2017; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). No one method has been found to be the best way to incorporate mindfulness, however, studies have attempted to determine the best method. For example, a meta-analysis looked at mindfulness interventions in higher education and found that interventions of at least two weeks produced positive outcomes, including decreased levels of perceived stress (Halladay et al., 2019). Of the interventions studied, the researchers found no significant difference between longer and shorter interventions. Another study looked at formal mindfulness training versus informal training (Hindman, Glass, Arnkoff, & Maron, 2015). Both methods produced positive outcomes, including a decrease in stress levels, but greater results were seen in the formal education group. However, students who went through formal mindfulness training, with assigned home mindfulness practices, reported not having time to complete the formal meditations outside of the mindfulness class (van der Riet, Rossiter, Kirby, Dluzewska, & Harmon, 2015). Given the lack of studies demonstrating best practices and the fact that various methods result in positive effects, there may be no "one" way to incorporate mindfulness into higher education.

When focusing on online graduate students it is important to design interventions that can easily fit into their busy schedules as they do not always have time to participate in full eight-week courses, in-person, or online. An open access course is one way to deliver the information in a meaningful way. One group of researchers created a "Learning Mindfulness Online" two-week course, delivered via Moodle (Cavanagh et al., 2013; Cavanagh et al., 2018). The course included videos, readings, daily practices, 10-minute daily meditations, and participants were encouraged to record their experience in a daily journal. Using a wait-list control group, the researchers studied the effects of this two-week course with university students (Cavanagh et al., 2013). Results demonstrated a statistically significant increase in mindfulness and a decrease in perceived stress, anxiety, and depression. Interestingly, the study was repeated to determine the impact that formal meditations have on the variables (Cavanagh et al., 2018). One group took the course with the 10-minute meditations and one group took the course without the meditations. Both groups demonstrated statistically significant improvements in mindfulness, perceived stress, anxiety, and depression when compared with the wait-list control group (Cavanagh et al., 2018). These results demonstrate that short, self-guided online mindfulness courses, with and without formal meditations, can positively impact university students.

Mindfulness in higher education is still new and little research has been done with online students. Furthermore, online graduate students have very little time for anything extra, so the mindfulness practices need to be designed so that they are seen as "value-added." Therefore, research is needed to examine the perceived impact of offering mindfulness education in online higher education. The purpose of this explanatory sequential study was to explore the impact of teaching mindfulness to online graduate students on levels of perceived stress, mind wandering,

and persistence. The following research questions guided this explanatory sequential mixed methods study:

1. Are there significant differences in online graduate students' self-reported levels of stress, mind wandering, and persistence when comparing before and after completion of an open-access mindfulness course?

2. What are the perceptions of online graduate students who complete an online open access mindfulness course?

Methods

Open Access Mindfulness Course

An open access course, titled "Mindfulness and Optimal Performance" was designed by a group of doctoral students with expertise in mindfulness and subsequently used for this study. The course was created using the university's learning management system. The open access course had three modules: (a) Mindfulness and Personal Wellbeing, (b) Mindfulness and Learning, and (c) Mindfulness, Culture, and Community. For this study participants only completed the first module, "Mindfulness and Personal Wellbeing." This module was intentionally selected for this study because it provided important foundational information about mindfulness. Additionally, the module included practical methods that could be immediately applied to students' personal and academic lives. Formal meditations were not assigned, however, suggestions for daily practice were included.

The content in the first module was divided into three sections: (a) What is mindfulness? (b) Stress, coping mechanisms, and learning, and (c) Sleep's impact on performance. Each section was designed with the adult learner in mind as information was presented in the form of short (<15 minutes) videos, brief readings, and engaging activities. Overall, the estimated time to complete the first module was three and a half hours. Students in the study had three weeks to complete the module. Weekly announcements were posted and emailed to remind students to participate in the course and encouraged students to practice mindfulness daily.

Data Collection Procedure

During the Fall 2019 Semester, after obtaining IRB approval, an email invitation for participation was sent out to all online graduate students in the School of Education and the College of Nursing and Health Professions at the study university. To obtain access to the course content, students had to complete the pre-survey. Quantitative data was obtained through a pre-test Likert-style survey. The survey contained demographic questions and valid and reliable instruments to gather quantitative data related to perceived stress, mind wandering, and perceived persistence. Participants then had three weeks to complete Module One of an open access course tiled, "Mindfulness and Optimal Performance." Upon completion of the module, additional quantitative data was obtained using a post-test Likert-style survey. Participants completed the same instruments on the post-test to measure levels of perceived stress, mind wandering, and perceived persistence. Students who completed the post-survey were entered into a drawing for six $50 Amazon Gift Cards. Six of the participants were invited to participate in individual interviews via Zoom to obtain qualitative data and gain insight into the participants' perceptions of the course.

Instruments

Perceived Stress Scale (PSS*).*** The Perceived Stress Scale (PSS) was used to measure levels of subjective (or perceived) stress after students completed Module One (Cohen et al., 1983). While the PSS was originally developed in 1983, it has been used in many mindfulness studies and continues to be used to measure the impact of mindfulness on levels of perceived stress (e.g. Epel et al., 2004; Hölzel et al., 2010; Lam, 2015; Spadaro & Hunker, 2016; Shapiro et al., 2012). The original survey included 14 Likert-style questions that asked participants to rate their feelings and thoughts over the past month (Cohen et al., 1983). Since then a shortened, four-question and ten-question surveys have also been developed. Reliability and validity have been established for both surveys (Cohen & Janicki-Diverts, 2012; Warttig, Forshaw, South, & White, 2013). Warttig et al. (2103) tested the 4-question survey with 1568 participants and the survey demonstrated internal reliability of .77. The four-question survey was used in this study, with one minor revision. Given that participants were surveyed after completing one mindfulness module from an open access course, instead of using a recall period of over "the past month," the recall period used was "the past week." The author allows free use of the tool and revisions of the recall period for educational research.

Mind Wandering Questionnaire (MWQ). The Mind Wandering Questionnaire (MWQ), a five-question Likert-style instrument, was utilized to measure levels of mind wandering before and after students completed Module One (Mrazek et al., 2013). Using a study with 663 undergraduate students, ages 18-58, the MWQ demonstrated internal reliability of 0.85 (Allan Cheyne, Solman, Carriere, & Smilek, 2009). Additionally, validity was established in a study with 77 undergraduate students, ages 18-22 (Allan Cheyne et al., 2009). The established reliability and validity, coupled with the short length of the survey, made the instrument ideal to measure the impact of mindfulness on mind wandering. The authors of the instrument allow researchers to use the MWQ for educational purposes, without written permission.

College Persistence Questionnaire (CPQ). The College Persistence Questionnaire (CPQ) (Davidson et al., 2009) was utilized to measure levels of perceived persistence before and after students completed the Module One. The CPQ was developed to both identify at-risk students and to determine variables that contribute to and hinder undergraduate student persistence (Davidson et al., 2009). The survey includes six student experience themes: (a) Institutional Commitment, (b) Degree Commitment, (c) Academic Integration, (d) Social Integration, (e) Support Services Satisfaction, and (f) Academic Conscientiousness. Studies using the CPQ both with undergraduate students (Davidson et al., 2009) and online students (Beck & Milligan, 2014), found that the CPQ predicted retention and institutional commitment. For the purposes of this study, questions relating to Institutional Commitment and Degree Commitment were utilized. Permission to use the CPQ for the purpose of this dissertation was obtained via email from Dr. Davidson.

Semi-structured Interview Template. Semi-structured interviews were held via Zoom and lasted 15-20 minutes. The purpose of the interviews was to gain greater insight into the results of the quantitative data and to explain any unexpected outcomes. The questions asked students to reflect on their experience completed Module One and the impact the module had on their level of stress, mind wandering, and commitment to their plan of study.

Study Population

A total of 104 online graduate students enrolled in the study. Of the students enrolled, 31 students completed Module One and the pre- and post-surveys. A full breakdown of the demographic data to describe the sample can be found in Table 1.

Table 1

Demographics Study Participants

	Number	Percentage
Gender		
Male	1	3%
Female	30	97%
Age		
20-29	7	23%
30-39	9	29%
40-49	8	26%
50-59	6	19%
60-69	1	3%
College and Degree Level		
CNHP Master's	15	48%
CNHP Doctoral	3	10%
SoE Master's	5	16%
SoE Doctoral	8	26%
Quarters Completed		
0	7	23%
1	2	6%
3-5	10	32%
>6	12	39%
First Family Member to Attend College		
Yes	10	32%
No	21	68%
Experience with Mindfulness		
No Experience	5	16%
A Little Experience	16	52%
Moderate Experience	8	26%
Very Experienced	2	6%

For the interviews, maximal variation sampling was used to identify participants for the interviews (Creswell & Guetterman, 2019). On the post-survey, students indicated if they were interested in participating in an interview. Using the pool of interested students, six participants (see Table 2), with varying characteristics including gender, enrolled plan of study (e.g. nursing, education), enrolled degree level (masters, doctoral), and mindfulness experience, were selected. The decision to interview six participants was made to ensure there was representation from the different demographic categories including degree program, college, and age group.

Table 2

Demographics for Interview Participants

	Age	Gender	First Generation Student	Degree Program	Quarters Completed	Mindfulness Experience
Participant 1	30-39	Female	No	CNHP Master's	3-5	Moderate Experience
Participant 2	20-29	Female	Yes	SoE Doctorate	>6	A Little Experience
Participant 3	40-49	Male	No	SoE Doctorate	>6	A Little Experience
Participant 4	40-49	Female	No	CNHP Master's	1	A Little Experience
Participant 5	60-69	Female	Yes	SoE Doctorate	>6	Very Experienced
Participant 6	20-29	Female	No	SoE Master's	>6	Moderate Experience

Data Analysis

To analyze the quantitative data, both descriptive and inferential statistics were used. Descriptive statistics were used to examine the average levels of stress, mind wandering, and persistence amongst online graduate students before and after completing Module One. Inferential statistics, specifically dependent paired t-tests (Salkind, 2017) were conducted to compare the means for each variable before and after the intervention. These quantitative analyses provided valuable information when examining the impact that the mindfulness module had on levels of perceived stress, mind wandering, and persistence.

To analyze qualitative data a thematic approach was then taken (Creswell & Guetterman, 2019) using first and second cycle coding (Saldaña, 2016) to identify themes and subthemes. The interviews were transcribed and coded using structural, descriptive, emotional, and in-vivo coding (Saldaña, 2016). After completing the first-cycle coding, second-cycle coding was used. Pattern coding was utilized to identify themes and subthemes (Saldaña, 2016).

Results

Quantitative Results

The results from the quantitative data analysis were used to answer the first research question, "Are there significant differences in online graduate students' self-reported levels of stress, mind wandering, and persistence when comparing before and after completion of an open-access mindfulness course?"

Perceived Stress. The Perceived Stress Scale (Cohen et al., 1983) consists of four Likert-style questions. Each question has answers ranging from 0 (never) to 4 (often), with the coding for questions two and three reversed. All answer values are added together, therefore, scores range from 0 (low perceived stress) to 16 (high perceived stress). The overall PSS mean on the pre-

survey was 7.19 and the overall PSS mean on the post-survey was 5.52, with a difference of 1.67 between the pre- and post-surveys (see Table 3). The dependent paired t-test results revealed that self-report levels of perceived stress after students completed Module One of an open access mindfulness course (M = 5.52, SD = 2.64) were significantly lower compared with levels of perceived stress before students completed Module One (M = 7.19, SD = 3.39); t(30) = 4.655, p =.000, one-tailed (see Table 3).

Mind Wandering. The Mind Wandering Questionnaire (Mrazek et al., 2013) has five Likert-style questions. Answers for each question range between 1 (almost never) to 6 (almost always). To interpret the MWQ results, all answers are averaged together, so final scores range between one (low mind wandering) and six (high mind wandering). Overall, the pre-MWQ mean was 4.06, the post-MWQ mean was 3.10, and the difference between the pre- and post-MWQ means was 0.96 (see Table 3). The dependent paired t-test analysis showed that levels of mind wandering after students completed Module One of an open access mindfulness course (M = 3.10, SD = 1.10) were significantly lower compared with levels of mind wandering before students completed Module One (M = 4.06, SD = 1.21); t(30) = 4.851, p =.000, one-tailed (see Table 3).

Perceived Persistence. Eight of the College Persistence Questionnaire (Davidson et al., 2009) survey questions specifically related to degree and institutional commitment were utilized for this study. Answers range from 1 (very unfavorable) to 5 (very favorable). "Not applicable" answers are not included in the calculations. All answers are averaged together for a total perceived persistence score, where a score of a one indicates low persistence and a score of five indicates high persistence. The overall pre-CPQ mean was 4.60, compared with the post-CPQ mean which was 4.69 (see Table 3).

Levels of perceived persistence before Module One of an open access mindfulness course (M = 4.60, SD = 0.57) were statistically similar compared with levels of perceived persistence after students completed Module One (M = 4.69, SD = 0.56); t (30) = -1.677, p =.052, one-tailed (see Table 3). To further explore the data, dependent paired t-tests were also examined for specific groups of participants (see Table 4). Higher levels of perceived persistence were found only with participants with little to no experience with mindfulness, participants who meditated four or more times a week, and participants in the first or second quarter of their graduate program.

Table 3

Dependent Paired t-Tests

	Mean	N	Std Dev	*dependent paired t-tests*		
				t value	Df	Sig (one-tailed)
Pre-PSS	7.19	31	3.39	4.655	30	.000
Post-PSS	5.52	31	2.64			
Pre-MWQ	4.06	31	1.21	4.851	30	.000
Post-MWQ	3.10	31	1.10			
Pre-CPQ	4.60	31	.57	-1.677	30	.052
Post-CPQ	4.69	31	.56			

Table 4

Dependent Paired t-Test Values for Specific Groups

|	t value	Df	Sig (one-tailed)		t value	Df	Sig (one-tailed)
Meditated >4 days/week				*Quarters Completed – 0-1*			
PSS	3.623	14	.015*	PSS	2.393	8	.022*
MWQ	3.567	14	.015*	MWQ	1.768	8	.058
CPQ	-2.116	14	.027*	CPQ	-2.234	8	.028*
Meditated <4 days/week				*Quarters Completed - >2*			
PSS	2.905	15	.001**	PSS	3.933	21	.000**
MWQ	3.242	15	.003**	MWQ	5.066	21	.000**
CPQ	-0.629	15	.270	CPQ	-0.899	21	.190
Degree Program – Master's				*Age – 20-29 years-old*			
PSS	3.203	19	.003**	PSS	2.151	6	.038*
MWQ	3.150	19	.003**	MWQ	1.240	6	.131
CPQ	-1.200	19	0.122	CPQ	-1.536	6	.088
Degree Program – Doctoral				*Age – 30-39 years-old*			
PSS	3.766	10	.002**	PSS	4.600	8	.001**
MWQ	4.079	10	.001**	MWQ	2.211	8	.029*
CPQ	-1.550	10	.076	CPQ	-1.809	8	.054
Mindfulness Experience - No Experience/ Little Experience				*Age – 40-49 years-old*			
PSS	3.234	20	.002**	PSS	2.646	7	.016*
MWQ	4.425	20	.000**	MWQ	3.201	7	.008**
CPQ	-2.942	20	.004**	CPQ	0.560	7	.296
Mindfulness Experience – Moderate Experience/ Very Experienced				*Age – ≥50 years-old*			
PSS	3.943	9	.002**	PSS	0.354	6	.368
MWQ	2.183	9	.029*	MWQ	3.011	6	.012*
CPQ	.200	9	.423	CPQ	-1.691	6	.071

**Significant at the .01 level
*Significant at the .05 level

Qualitative Themes

The themes from the qualitative data were used to answer the second research question, ""What are the perceptions of online graduate students who complete an online open access mindfulness course?"" The themes and subthemes that emerged can be found in Figure 1.

Figure 1.

Graphic Summary of Themes and Subthemes.
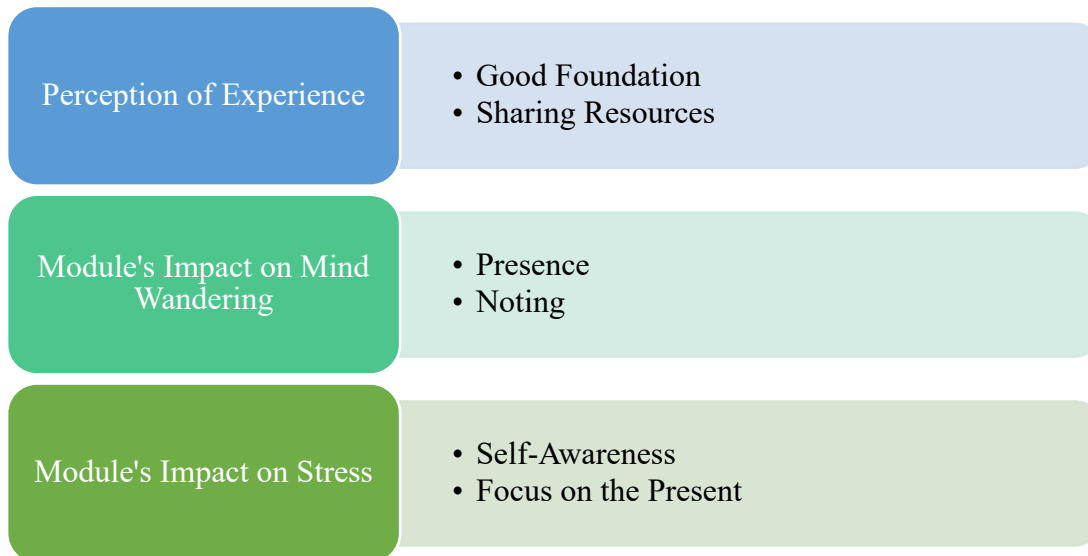
Perception of Experience. Participants were asked to describe their experience with completing Module One of the open access mindfulness course. All six interview participants stated that they enjoyed the course. Participant 1 stated, "So I loved it. You know, I was like super excited about it." Participant 5 commented that she thought the course "should be a requirement." Participant 6 said, "I looked forward to doing that [Module One] more than my other course work." Lastly, Participant 2 said:

> I was a little hesitant to complete [the course]. I saw the course [and thought], oh, this looks like work. Oh no, what did I signed myself up for it? But as I started doing it, I was like, oh, this has actually been very, it was very, very helpful. I was like I do need to just take that time to step outside of myself for a minute

When moving past the participants' initial reactions and delving deeper into their perceptions of the course, four subthemes emerged: "good foundation" and "sharing resources."

Good Foundation. Four of the participants felt that Module One of the course provided a good foundation of mindfulness education in an easy-to-understand manner. Participant 1 explained why she felt the course was a good foundation:

> I love it. I love the videos like I, you know, because it's also easy, it's not really like dense and difficult to understand. It's like easy and it makes a lot of sense. So it's been really good. And I've really enjoyed it.

Participant 3 echoed this response when he stated:

> I thought it was good, especially for someone like me who doesn't know a lot about it [mindfulness]. It didn't talk over my head. You know, it was basic. And when I say basic. I don't mean this in a bad way.

Participant 2 also thought it provided a good foundation and should be a requirement before students start their program. She explained:

> I think it's something important to do. I think it's something that should be done in the beginning of the program. Yeah, I think that in the beginning when they start like that cohort class you [should] have access to it right there because you kind of need. And I think it's something you sometimes need to go back to.

For Participants 1, 2, and 3, the course provided a good base since they only had a little experience with mindfulness. On the other hand, Participant 5 was very experienced with mindfulness. From the perspective of someone who had extensive mindfulness experience, Participant 5 shared that she thought:

> [Module One] was a good class. I mean, I think, for, for those who have not done anything with mindfulness it was a nice introduction. You know, I've had some experience in mindfulness and it really brought me back to where I knew I need to be daily and you know how I can include that into my life more.

While Participant 5 may have been familiar with the content, it was still a good reminder for how she can incorporate mindfulness into her daily life. Therefore, overall the participants felt that Module One provided a good foundation for mindfulness.

Sharing Resources. Another subtheme that emerged was "sharing resources." In two of the interviews, the participants discussed extensively how they shared the resources from the module. Participant 1 said:

> Module One I thought like had so many good resources that I wasn't aware of like all the videos and stuff. I was like I was like texting them to my husband. I was like, listen to this, like, this is so cool. And then I liked one of the websites, mindful.org, I think, which I wasn't familiar with either. And then it took me to a link and it was on mindful leadership, so like I shared that with my nurse managers and my director and the clinical coordinator. I shared it with all them as well because we're like struggling in general with mindfulness at my hospital.

Participant 1 also shared information about the meditation apps with her family and colleagues. She stated, "Calm is like my absolute favorite. I shared it with some of my colleagues and I have a lot of nurses in my family so shared it with them too."

Participant 4 explained that she shared information with her family member who has been hospitalized to help him manage his pain more effectively. Participant 4 explained, "I actually shared it with my [family member], who's been in the hospital for a long time to kind of do it for pain management purposes, you know, guided imagery, to help control pain." Overall, two participants found resources in the module that they felt other people in their life would benefit from.

Module's Impact on Mind Wandering. The second theme identified was "module's impact on mind wandering." The majority of the interview participants said that their minds

significantly wanders. For example, Participant 1 said that her mind wanders a lot and that she is "significantly distracted." She elaborated:

> I would say in general like I'm pretty easily distracted. Like significant mind wander[ing]. A lot of times I'll drive to work and like I won't remember…I'm like going through [the motions]. Like I arrived, but I don't remember anything about the drive because I'm not paying attention. I'm just like doing it. So, and I thought that was interesting about the module, because I had not connected mind wandering to mindfulness. But I am pretty guilty of watching a lecture and then I'll just like look away and put stuff on my to-do list or, you know, like remember stuff in a meeting. I'll be in a meeting at work, and I'll write down a bunch of stuff that I have to do after the meeting because and I'm not like [focused].

Participant 4 explained that her level of mind wandering can vary, but when it is high it impacts her quality of life. She explained, "um, it [level of mind wandering] really varies. [When] it happens more frequently it does impact, like the quality of life because I find myself sometimes I'm not mentally present with my kids."

When Participant 3 was asked about his level of mind wandering, he said 'I wander a lot!" and Participant 4 said her level of mind wandering is "pretty high." Participant 6 answered with, "It [mind wandering] is higher when I am stressed."   Participants 1, 2, 3, 4 and 6 all felt that the module impacted their level of mind wandering. Participant 5 already had methods to identify when her mind had wandered to improve her focus. For example, she uses the phrase "not now" when her mind starts to wander.

> It's just like when you sit down to spend time just getting grounded. I want to meditate, I want to think about something that is going to calm me, that centers me, and anything else that comes up is, is "not now," you know, and so those are my words, "not now."

For the other five participants, the subthemes that emerged were "presence" and "noting."

Presence. A common subtheme that emerged was the idea of "presence" or being able to live in the present moment. When Participant 3 was asked about the impact of the module on his level of mind wandering, he stated, "I think for me, more or less it's about just being in the present moment." Participant 2 echoed this response. She stated, the course:

> helped me, you know, not be kind of everywhere because a lot of times we're kind of our brains are everywhere, your brain is in like 9,000 places at one time. So, it was just nice to kind of just be present in the moment. To remember to be present in the moment.

Participants 1 and 4 specifically shared how they would practice being present. Participant 4 said she would practice with her kids "while we were eating lunch. We'd play a game together and just really [I would think] I'm here, I need to be here." Participant 4 also went on to explain that as a result of Module One, she practiced presence through the use of mindful eating so that she was not eating on autopilot while her mind was thinking about unrelated things. She explained that she practiced mindful eating "with my lunch. [I would say] okay, stop. You're inhaling your food, but you're not feeling the textures. You're not enjoying what you're eating and you're just eating."

Participant 1 said that she practiced presence while commuting. She elaborated that was able to apply what she learned in the course…

…especially on my commute. I drive to and from work every day and then like I would notice in the morning like kind of zoning out and then. So sometimes I do like some of the Calm commuting meditations. If I'm zoning out. I'll be like, okay, my mind is wandering. So I would say yes just that it [Module One] kind of like brought it to the forefront of my mind that you know some things like I do go through the motions and I don't pay attention to what I'm doing.

Overall, four of the participants took away the importance of presence to increase this focus and decrease mind wandering.

Noting. In order to decrease mind wandering, mindfulness teaches people to recognize when their mind has wandered so that they do not get tangled up in the unrelated thought. "Noting" when their mind had wandered was another subtheme that emerged. Participant 6 stated that the module "improved my ability to note the stress and still continue on with what I need to be doing." Participant 4 echoed this response and stated:

Mindfulness also is helping me catch myself when my mind starts wandering and starts getting on this negative path of thinking… It doesn't necessarily take a completely away but it helps catch me and tells me, okay, no. You need to stop and you need to focus on something else.

Participant 1 had a similar response and stated "if I'm like zoning out. I'll be like, Okay, my mind is wandering." Overall, three of the participants took away the ability to notice when their mind wanders.

Module's Impact on Stress. The third theme that emerged was the "module's impact on stress." While the majority of the participants felt that the module significantly helped their mind wandering, not all participants were sure that the module impacted their level of stress or if their stress improved due to external factors, such as the ending of the fall quarter. For example, when Participant 1 was asked if Module One had any impact on her level of stress, she replied: "It's hard to say that is was the module or the combination of factors in my life that tied up and I was able to move on." Participant 6 also was not sure that Module One improved her level of stress, but stated:

I would say it was, it was kind of nice to see the videos about stress. And because it's always a nice reminder that [stress] is a universal experience. It's not something unique to me. It's something that everyone goes through.

While two participants were not sure their stress improved as a result of the module, two subthemes did emerge including, "self-awareness" and "focus on the present."

Self-awareness. The first subtheme that emerged was "self-awareness." Participants 1, 4, and 6 felt that the module impacted their level of stress by making them more self-aware. While Participant 1 was unsure if the module reduced her level of stress, she did say that the module helped her to become more aware of her stress. She explained:

I think one of the things that helped about the module especially was some of the videos about the actual structural changes in the brain that occur with, you know, stress and anxiety. There was one, it says, like what you practice you become. I don't know if I'm saying it correctly, but the awareness of that all of the stress is not always good. So I think it made me just become more awake, like, okay, I am feeling stressed. Like, take a deep breath. So I would say more aware just more aware that you know what's going on right now. Trying to connect it with like what's actually happening in my brain and like what's good to do right now.

Participant 4 stated, 'I think for me, one of the big things was just kind of becoming more aware." The following quote by Participant 6, which also fell under the subtheme of "noting," illustrates how the module helped Participant 6 be aware of her own stress and still be able to be in the present moment: "[Module One] improved my ability to note the stress and still continue on with what I need to be doing."

Focus on the Present. The second subtheme that emerged was that Module One improved participants' ability to "focus on the present" and respond, as opposed to react in stressful situations. For example, Participant 3 described a big take-away from Module One as:

> You know, when the world is on top of you. And you're like, Whoa, whoa, whoa. We got to chill here and just being able to take that step back. That was one of the big things that I can recall.

Participants 2 and 4 had similar responses when discussing the impact of Module One. Participant 2 was currently working on her dissertation while completing Module One, so she stated when she was trying to focus on preparing her proposal defense she would apply what she learned in the module and say to herself, "I was like, okay, breathe. Think about what you're going to do. Just think about it." Participant 4 elaborated on the idea of focusing on the present moment to help with their stress, and also added the concept of responding, as opposed to reacting.

> I do think mindfulness is really helpful. At the end of the day, we have so many stressors. I think it's kind of like that halt. It gives you time, your brain time to think. And also, just being mindful, it helps you stop and pause. I think it helps you put things in perspective because you are not just reacting.

Discussion

Mindfulness Module's Impact

When looking at the overall data, self-reported levels of perceived stress and mind wandering were significantly lower after students completed Module One. Self-reported levels of perceived persistence were slightly higher after students completed Module One; however, the t-test value was statistically insignificant. Possible explanations for the lack of statistically significant results are the same as detailed above for the first research question. Most significantly, the overall perceived persistence values on the pre-survey were high, therefore, there was not much room to see an increase in perceived persistence values.

The overall data was also divided into groups to examine the impact of Module One on specific subsets of the sample. Statistically significant higher levels of self-reported perceived persistence were found only with participants with little to no experience with mindfulness, participants who meditated four or more times a week, and participants in the first or second quarter of their graduate program. Several possible explanations exist for these unique results. First, most attrition in online programs usually occurs early in the students' plans of study (Willging & Johnson, 2009). Therefore, students who are just starting their program may be less committed than those students who have a considerable amount of coursework completed. Second, there are mixed results in the literature regarding if formal meditations are required to see a positive impact on self-report scores. For example, in a study by Hindman et al. (2015), researchers found that a six-week course with formal meditations produced more favorable results than a course without formal meditations. However, in a study by Cavanagh et al. (2018), a two-

week online course with and without formal meditations produced positive outcomes. It is important to note that neither of the studies examined the impact on persistence.

Overall, Module One of an open access course which provided foundational information about mindfulness resulted in significantly lower levels of self-reported perceived stress and mind wandering. While self-reported perceived persistence levels were slightly higher after Module One, the t-test value was statistically insignificant, indicating that more research is needed on the impact of mindfulness education on persistence and retention.

Perception of the Course

The overall perception of the open access mindfulness course from the students interviewed was that the module provided a good foundation using easy to understand language and included engaging resources. Participants felt that the course was beneficial and should be required for all incoming students. Regarding the resources and mindfulness practices, students felt that the videos were particularly engaging and impactful. During the interviews, participants mentioned using mindful eating, the *Calm* app, and simply taking deep breaths.

The students interviewed also felt that what they learned in the module impacted their rates of mind wandering, more so than their levels of perceived stress. Five of the six participants rated their mind wandering as high during the one-on-one interviews. These participants said that while their mind wandering did not disappear, which was not expected, they felt that as a result of the module they were better able to notice when their mind had wandered and bring their focus back to the present moment.

As stated, the participants felt that their level of stress was not impacted as much as their level of mind wandering, however, they did identify several ways in which they were able to apply what they learned to manage their stress. For example, students felt they became more aware of their stress so that they were able to focus on the present, as opposed to engaging with unrelated stressful thoughts.

The fact that participants were unsure if the module impacted their level of stress was surprising, given the number of studies, including this one, that found a decreased level of perceived stress after the mindfulness intervention. It is possible that participants' levels of perceived stress decreased partially due to the fact that the post-survey was administered during the final week of the quarter. While this week could have potentially been very stressful, many students are also wrapping up assignments, so their stress could have been lower compared to mid-quarter when they took the pre-survey. Another possible explanation is that meditations or daily practices were not required, so that could have contributed to the participants' feeling unsure that the module impacted their level of stress. Lastly, there were only three weeks between the pre- and post-surveys. In one study by Baer, Carmody, & Hunsinger (2012), researchers examined participants' levels of perceived stress weekly during an eight-week mindfulness-based stress reduction course and did not find improvements in levels of perceived stress until week four. This finding presents the question of how much mindfulness training and practice is needed to see improvements in levels of perceived stress?

Overall, participants perceived the module as an excellent foundational course that included strategies that could be immediately applied to impact their level of mind wandering. They found the resources to be interesting and engaging and cited no barriers to completing the

course. Participants felt that the information in the course was important for new students and should be a requirement for all students prior to entering their graduate program.

Implications for Online Education

Online graduate students often must balance competing demands, such as school, work, and families, which can lead to increased levels of stress (Spadaro & Hunker, 2016). Stress can increase mind wandering (Banks & Boals, 2017) and decrease attention (Lukasik et al., 2019). Therefore, while students may be physically present or actively trying to engage with coursework, their minds may be ruminating on other life stressors. As a result, finding strategies to mitigate stress is critical for higher education institutions. This study revealed that enrollment in an open access mindfulness course can decrease levels of perceived stress and mind wandering. Additionally, self-reported perceived persistence may be increased for students in the first or second quarter of their academic program and with students who meditate four or more days per week. Therefore, institutions need to explore ways to support students holistically by offering an open access course during student onboarding to help students develop non-cognitive skills for persistence.

A recommendation is to offer an open access mindfulness course to all students upon acceptance into their graduate program. The students interviewed felt that the course provided an excellent foundation of mindfulness in an easy-to-understand manner. That self-report levels of perceived stress and mind wandering were significantly lower after the completion of Module One indicates that the skills learned in the course may be beneficial for students throughout their entire graduate program. Additionally, one of the only groups of students that showed statistically significant higher levels of perceived persistence were the students in the first or second quarter of their graduate program. Therefore, offering a mindfulness course early could increase persistence.

The design of the course is also critical because students in online graduate programs are often juggling many commitments, so the course needs to be valuable and not just "one more thing to do." When creating an open access mindfulness course, it is important to include short, engaging resources with practical strategies that students can immediately apply. The videos were the most viewed resource in the module. Additionally, the videos were the most cited resource during the interviews. Therefore, a recommendation would be to include short, engaging videos to capture the students' attention. The course should also not take too much time to complete, include only what students need to know, and offer realistic mindfulness strategies that can be immediately applied. While students in this study who meditated greater than four times per week did show an increase in persistence, the researcher recommends cautiously requiring students to meditate a specific number of times per week as the results in the literature vary. For example, in one study researchers found that a mindfulness course with assigned home practice results in more significant results, however, students reported not having time to complete the formal meditations outside of the mindfulness class (van der Riet et al., 2015). Therefore, the risk in assigning required meditations is that students may drop out of the course because of lack of time to complete them. In this course, that did not utilize formal meditations, students did not report any barriers to completing the course.

Limitations and Future Research

There were several methodological limitations, or potential weaknesses, in this study. The first is that a convenience sample was utilized, as opposed to random sampling. There is a possibility that all students who were interested in the mindfulness course and the research study

already had an interest in mindfulness and believed the course would be beneficial. The sample that was used was also small and therefore results cannot be generalized. Additionally, it is possible that only the participants who enjoyed the course volunteered to be interviewed, given the overall positive feedback. A second limitation of the study is that there was no control group used in the design. Therefore, the impact of this one intervention was examined, however, there was not a comparison to another type of intervention. A third limitation is that the sample population was almost all female, with only one male participant. Additional research would need to be done to see if male students respond the same to the open access course. Last, the open access course that was used in this study has three modules, however, only the impact of the first module was examined in this study design.

Based on the findings and limitations of this study, there are several recommendations for future research. This study should be replicated using a larger and more diverse sample of students and across disciplines, especially with disciplines that report high attrition rates. Since this study focused on graduate students, a study should be conducted with undergraduate students to examine the impact of an open access mindfulness course with this level of students. Last, a longitudinal study should be conducted to examine the long-term impact on persistence. It is imperative that research continues to find ways to support students holistically.

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