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Mindfulness Training for Pre-Service Teachers Using Ecological Momentary Assessment

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School Psychology, The University of Montana

Mindfulness Training for Pre-Service Teachers Using Ecological Momentary Assessment

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Thesis

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Abstract

There is a high-rate of burnout among teachers around the US often linked with the increasing stressors and demands (e.g., Iancu, Rusu, Măroiu, Păcurar, & Maricuțoiu, 2018). Additionally, Jennings and Greenberg (2009) demonstrated the importance of teachers' social and emotional competence for promoting well-being and academic success in classrooms. Stress that is overwhelming or unaddressed can lead to teacher burnout, but there may be effective ways of promoting self-care among teachers, such as mindfulness-based practices. The current project included psychoeducation on the applications of mindfulness for teachers and repeated collections of self-report questionnaires to investigate the utility of mindfulness-training for pre-service teachers. Ecological momentary assessment was used to allow for real-time data to be collected about stress, coping techniques, and engagement with mindfulness. It was anticipated that daily reminders to practice mindfulness would increase levels of state-mindfulness and decrease stress levels. Analysis found a significant increase in participant understanding of mindfulness after 100 minutes of psychoeducation, as demonstrated by an increase in the accuracy of the definitions written by participants. Results also revealed significant positive relationships between frequency of mindfulness engagement and both the reported level of state-mindfulness and momentary stress. Implications for these results include future research, mindfulness education, and intervention programs for pre-service teachers.

Mindfulness Training for Pre-Service Teachers Using Ecological Momentary Assessment

Chapter I: Introduction

The school environment consists of many systems nested within the larger framework of educational law and society. The daily schedule, discipline policies, and school layout make up the environment in which teachers, students, and school staff spend approximately 1,000 hours a year. The overall climate of a school is made up of dynamic relationships between and within the populations of students and staff. School climate can be measured by various constructs, such as teaching and learning, interpersonal and institutional relationships, and the safety of the school (e.g. Skalická, Belsky, Stenseng, & Wichstrøm, 2015). Working within the system of a school, the climate serves as the foundation of student learning and teacher satisfaction. Research on school climate suggests that disruptive behavior and discipline are problematic in many schools, but that these negative outcomes may be reduced when teachers and administrators reward positive behaviors and seek out opportunities to work with smaller groups of students (Sulak, 2018). Improving the school climate can result in higher academic achievement (Noltemeyer, Ward, & Mcloughlin, 2015) and increased student morale (Cornelius-White, 2007).

Within the context of a school, individual classrooms serve as a place for students to grow and learn throughout childhood and adolescence. Education programs for students that improve skills in identifying and understanding emotions, or social-emotional learning, can aid students' social and academic development (Li, Allen, & Casillas, 2017). Social-emotional learning (SEL) includes skills in relationship building, strategies for positive self-talk, and guidance toward healthy attitudes about self and others (Stalker, Wu, Evans, & Smokowski, 2018). Teaching these skills to students has been shown to be helpful above and beyond typical behavioral management techniques (Domitrovich et al., 2016). Additionally, introducing SEL for

teachers can also positively influence classroom management and student outcomes, as teachers are role-models for students' social and emotional development (Jennings & Greenburg, 2009).

As a positive role model for children, teachers can demonstrate adaptive coping and emotion regulation within the classroom. Furthermore, the ability to regulate emotions is important, as teachers are faced with dynamic challenges in an often-chaotic work environment (Jeon, Hur, & Beuttner, 2016). The stressors that teachers commonly face include disciplinary problems, time pressure within the workload, low student motivation, and dissatisfaction in the value of their career (Skaalvik & Skaalvik, 2017). These stressors may build up over time, and, without effective coping methods, lead to poorer job performance and satisfaction (Carson, Baumgartner, Ota, Kuhn, & Durr, 2017). Furthermore, the number of stressors teachers face is positively associated with symptoms of burnout, such as exhaustion and low personal accomplishment (Richards, Levesque-Bristol, Templin, & Graber, 2016; Wong, Ruble, Yu, & McGrew, 2017). Thus, teacher emotion regulation is worthy of study and interventions aimed to improve emotion regulation among teachers is warranted.

The preparation and education of teachers is important for teaching efficacy, school cohesion, and the relationships between members of a school system. Pre-service teachers must be encouraged to develop coping methods for stress, including the use of social support and individual coping strategies. Teachers with more effective methods of coping show resilience against the effects of burnout and report lower perceived stress (Richards, Levesque-Bristol, Templin, & Graber, 2016). Skills in emotion regulation appear to protect teachers against the harmful side effects of stress and burnout. Loon, Heerema, Weggemans, and Noordegraaf (2018) demonstrated that job satisfaction and work engagement were positively associated with teachers' ability to cope with stress.

Many researchers argue for the importance of training teachers and pre-service teachers with social-emotional skills, such as stress management, coping, and discipline. Prior to the first year of teaching, pre-service teachers are often enrolled in both traditional coursework and practicum field work as student-teachers. It is as a pre-service teacher that many of the skills of teaching are being learned. Zimmerman (2018) claimed that the “importance of teacher resilience and wellbeing” is directly tied to pre-service teacher training (p. 57), and that social-emotional skills, such as mindfulness training, are vital components to preparing the next generation of teachers.

Mindfulness is an accessible coping strategy that teaches individuals to focus their attention on the present moment without judgment or attempts to change (Kabat-Zinn, 1994). The operational definition of mindfulness includes the key components of *self-regulation of attention* (i.e., to the present moment) and an *orientation to experience* (i.e., non-judgment; Bishop, et al. 2004). Mindfulness practice trains a person to acknowledge the temporary nature of emotions, feelings, and sensations, and has been shown to correlate with resilience, or the ability to withstand adversity and stress (e.g., Zhou, Liu, Niu, Sun, & Fan, 2017). Mindfulness has been conceptualized as both a trait and state, but key features are consistent and include awareness and non-judgment (Bishop et al., 2004).

Mindfulness-based interventions have increasingly been applied within the school system for students and children. For example, Zhou, Liu, Niu, Sun, and Fan (2017) found mindfulness to promote resilience among children who were being bullied by their peers. Additionally, Quach, Mano, and Alexander (2016) used a mindfulness intervention to show an improvement in working memory capacity compared to students in a control condition. The application of mindfulness in the schools appears to be widespread; however, considerable research must be

completed to find the best interventions and positive outcomes expected from mindfulness-based interventions.

Within the school setting, teachers have limited time and resources to devote to self-care and building skills that are not directly related to academic teaching, such as social-emotional intelligence. Brief interventions and informal practices may effectively improve coping skills and the ability to regulate emotions and respond to stress adaptively, while balancing the amount of time and money spent on trainings. Furthermore, researchers such as Zimmerman (2018) argue that cultivating mindfulness in teachers may help to boost their resilience to burnout and improve classroom outcomes. Methods to ensure consistent mindfulness practice among teachers have yet to be discovered. Brief interventions and the cultivation of an individual practice may have positive effects on stress and burnout among teachers.

Ecological momentary assessment is a relatively new measurement technique that allows researchers to collect vast data over brief periods of time. Participants are prompted throughout the day to complete self-reports or engage in experimental interventions; however, participants are not required to leave their current location (e.g., home, work) to complete study tasks. This measurement technique has been used to study various psychological phenomena, such as addiction (Swendsen, Serre, Fatseas, & Auracombe, 2014), psychopathology (Schlier, Winkler, Jaya, & Lincoln, 2018), and mindfulness practice (Ruscio, Muench, Brede, MacIntyre, & Waters, 2016). Ecological momentary assessment can be used to track participant fidelity to experimental intervention, changes in outcome variables, and frequency of behaviors.

Teachers are fraught with stressors and challenging situations they must face each day; however, mindfulness may be taught to teachers as a way to promote adaptive coping to stress and reduce the symptoms of burnout. Mindfulness practices are cultivated over time, as

individuals hone the ability to be consistently aware of and non-judgmental about the content of the present moment. Introducing mindfulness early within a teacher's career may prove to establish positive habits that will disrupt the development of burnout. Targeting pre-service teachers allows researchers to gain a sense of the intervention feasibility prior to competing with the schedule of teaching within a school. Through momentary assessment, the routine methods of coping with stress can be examined for individuals dealing with daily stressors. Additionally, prompting individuals to engage with a mindfulness exercise daily may increase intervention fidelity and promote positive outcomes. The cultivation of a mindfulness practice warrants research within the school system and among teachers.

Chapter II: Literature Review

School Climate

School climate involves academic performance, teacher-student relationships, and relationships between students. School settings are filled with a myriad of factors that contribute to the success of students, including the location of the school (e.g., Sulak, 2018), relationships between students and teachers, (e.g., Cornell & Huang, 2016), classroom size (e.g., Skalická, Belsky, Stenseng, & Wichstrøm, 2015), and the form of discipline used (e.g., Hoffman, Hutchinson, & Reiss, 2009). The established rules of conduct, the materials presented, and the individuals who make up the staff and student populations combine to affect the overall school climate. By considering the effects of school climate, teachers, administrators, and school psychologists can establish positive learning environments and problem-solve on a scale that affects all students. For example, the location and population size of a school contributes to the overall school climate. Sulak (2018) found that negative school behaviors (i.e., bullying, disrespect for teachers, and sexual assault) were highest among schools that hosted over 1000 students and were in crime-rich neighborhoods. This researcher suggested that administrators and teachers seek out opportunities to serve small groups of students and promote positive behavioral support within classrooms. As a measure of overall school success, school climate can inform how academic and social-emotional development should be serviced to children in the school (e.g., Gage, Larson, Sugai, & Chafouleas, 2016). Ultimately, the school climate should be molded to best support the growth and development of children and adolescents. Considering the numerous aspects of school climate, this section will briefly discuss disciplinary approaches, teacher-student relationships, and social-emotional education within the classroom.

Disciplinary Approaches. There are many approaches to improving climate in the schools, such as ensuring students are aware of specific disciplinary regulations and the rationale behind the school or classroom rules. For example, without clear expectations of their behavior, students may be more likely to talk out of turn and disrupt classroom learning. Additionally, schools with a high frequency of disruptive behaviors and school suspensions can see lower academic achievement among students compared to schools with fewer disciplinary problems (e.g., Noltemeyer, Ward, & Mcloughlin, 2015). As a way to promote positive school climate and academic achievement, teachers and administrators can adopt different styles of dealing with disruptive and problematic behavior. Teachers have the opportunity to establish classroom settings that are welcoming and supportive to all students. Students appear to become more engaged with holistic, learner-centered classrooms (Cornelius-White, 2007). Positive classroom climate has been associated with more consistent achievement of developmental goals (Jennings & Greenburg, 2009). Jennings and Greenburg (2009) introduced the pro-social classroom as a method of promoting social-emotional competency (SEC) among teachers and students to improve classroom and school-wide climate. The researchers argue that teachers' SEC influences the atmosphere of classrooms and the success of students; teachers that are able to empathize with students' emotions show greater concern in handling disciplinary problems (Jennings & Greenburg, 2009). By equipping teachers with SEC, classrooms become supportive of students' emotional development in addition to academic learning. Despite these promising findings, more research needs to be conducted to find effective SEC interventions that can be used with teachers.

Training pre-service teachers in discipline practices that are both efficacious and in-line with social-emotion wellbeing may provide classrooms with an overall positive climate. Jong

and colleagues (2014) found that the discipline practices of pre-service teachers predicted the quality of the student-teacher relationship. The results suggest that aggressive discipline styles are detrimental to the dynamic of student-teacher relationships. Jong and colleagues argue that pre-service teachers must be made aware of the effects of their discipline style. This suggests that students and the school climate may benefit from training pre-service teachers in social-emotional skills and effective discipline.

Hoffman, Hutchinson, and Reiss (2009) demonstrated that school climate may be improved by disrupting the disciplinary system within schools, with a lower reliance being placed on rewards and punishment, and an increased focus on the promotion of conflict resolution and emotional intelligence for staff and students. This study examined the effects of training teachers in emotional intelligence and a curriculum of classroom management entitled *Conscious Discipline*®, which instructs teachers to 1) embrace conflict resolution, 2) implement a reward system based on emotional intelligence, and 3) acknowledge the lack of control over external factors in classroom disruptions. Teacher education can be designed to include evidence-based practices that are aimed at improving school climate and effective discipline management. Teachers who completed the coursework on *Conscious Discipline*® reported more positive school climate, and some showed improved teacher-student relationships (Hoffman, et al.). These findings are especially impactful when considering that positive teacher-student relationships increase learning outcomes and support positive classroom climate (Skalicka, Belsky, Stenseng, & Wichstrom, 2015). This suggests that targeting teacher-student relationships can improve students' academic performance.

Teacher-student relationships. The school climate is positively influenced by the teacher-student relationships based on the expected behavior and consequences; schools with

clear discipline practices and supportive teacher-student relationships show less substance use, bullying, and mental health problems among students (e.g., Cornell & Huang, 2016). Cornell and Huang used self-reports from students as a measure of teacher-student relationships, perceptions of the disciplinary structure, and risk-taking behaviors. These researchers demonstrated that students who attended schools that use fair discipline and supportive teacher-student relationships as part of the overall school climate had lower rates of all risky behaviors measured (e.g., alcohol use, suicidal thoughts). This suggests that the relationship between teachers and students affects students' behaviors and perceptions of school climate. Quin (2017) conducted a systematic review of current literature on teacher-student relationships and revealed that teacher-student relationships positively influence student engagement and motivation, stating that “[l]ongitudinal and cross-sectional associations remained when covariates from the individual, family, school, and teacher contexts known to influence student engagement were controlled for” (p. 345). Researchers concluded that the more positive the teacher-student relationship, the greater the student outcomes. Becker, Gallagher, and Whitaker (2017) found a positive relationship between the quality of student-teacher relationships and the level of dispositional mindfulness of pre-school teachers. This suggests that internal factors, such as coping style, influence the way that teachers interact with their students. Promoting mindfulness among teachers may positively influence teacher-student relationships.

It is well established that internal factors, such as engagement and motivation, influence students' academic success (e.g., Lei, Cui, Zhou, 2018). Fan and Williams (2018) revealed that student motivation plays a mediating role in the relationship between specific aspects of school climate (i.e., fairness, discipline, and teacher-student relationships) and academic performance. For example, if students perceive that the rules of the school are clearly stated and fair, they

showed higher confidence in math and reading abilities. Furthermore, high self-efficacy in math and reading was positively associated with achievement (Fan & Williams, 2018). McBride, Chung, and Robertson (2016) revealed that social-emotional learning programs can help prevent academic disengagement among students. In other words, social-emotional learning promotes individual skills that produce positive outcomes within the schools.

Social-Emotional Learning. School climate can be improved by providing individuals with social-emotional learning or competence in the recognition and regulation of emotions. Social-emotional learning (SEL) includes knowledge of the spectrum of emotions, strategies to identify and moderate experiences of emotion, and potential consequences to emotions in daily life. As part of social-emotional learning, many interventions and education programs include curriculum on making and maintaining healthy relationships, identifying and regulating emotions, and recognizing emotions in others (e.g., Domitrovich et al., 2016). Dysregulated emotions underlie many behavioral disruptions (e.g., feelings of anger may lead students to engage in physical violence); thus, SEL is a core component of school climate. Competency in this area includes a set of skills, which enable an individual to understand emotions and motivation in the context of social interactions with others. McCormick, Cappella, O'Connor, and McClowry (2015) revealed that a social-emotional education program reduced the frequency of disruptive behavior among students in urban elementary schools. Parents and teachers were recruited to participate in a training on supporting emotional development and students were provided with a classroom-based SEL intervention. Among students receiving the SEL intervention, reading achievement increased and behavioral problems decreased compared to those enrolled in supplemental reading coaching as a control (McCormick et al., 2015). The reduction in behavioral problems after receiving social-emotional education suggests that

students can learn to identify their emotions and the consequences of their emotions and change their behavioral reactions.

Students provided with social-emotional education are taught to identify emotions and reactions to emotion, empathize with others, and resolve conflicts (e.g., Stalker, Wu, Evans, & Smokowski, 2018; Taylor, et al., 2017). In a meta-analysis of recent literature on social and emotional learning interventions, Taylor, Oberle, Durlak, and Weissburg (2017) found that children who had received SEL interventions showed significantly better outcomes compared to controls (e.g., better graduation rates, greater social-emotional skills). Providing social-emotional education to students appears to be related to many aspects of achievement, well-being, and positive growth.

Relatively few studies have looked at the impact of social-emotional education for teachers. However, Domitrovich and colleagues (2016) compared behavioral management programs to understand the effect of including components of SEL. Teachers using programs that integrated SEL reported greater efficacy of behavioral management compared to those only using a classroom behavior management program. Supporting social development of students through SEL can aid teachers in classroom management (Domitrovich et al., 2016). This suggests the utility of training teachers in SEL as part of general classroom management. Furthermore, if teachers demonstrate high levels of social-emotional competency themselves, the instructional behavior can promote classroom cohesion and positive outcomes (Jennings & Greenburg, 2009).

Teacher Emotional Regulation

Within the classroom, teachers are faced with circumstances that can challenge their ability to remain calm and effective in classroom management. Equipped and practices with

skills of emotional regulation, teachers can model social emotional competence and demonstrate the importance of monitoring one's emotions. Domitrovich and colleagues (2016) describe the effect of social-emotional programs on teachers as a "proximal outcome" in relation to students' social and behavioral outcomes. The focus of this research included teacher self-efficacy, burnout, and social-emotional competence. Results showed that teachers benefit most from behavioral intervention curriculum that includes social emotional competence (Domitrovich, et. al). This suggests that teachers and students can both benefit from social-emotional programs that teach participants how to identify and regulate emotions. The ability to regulate one's emotions can lead to resilience against the negative effects of stress among teachers (Lavy & Eshet, 2018). Researchers revealed that teachers who used active regulation (e.g., cognitive reappraisal) in response to negative emotions reported higher levels of job satisfaction compared to those who used passive emotion regulation strategies (e.g., "faking in bad faith," p. 152, Lavy & Eshet). This suggests that teachers with emotion regulation strategies are better equipped to face the daily stresses of the profession.

Through a literature review for resilience among teachers, Mansfield, Beltman, Broadley, and Wetherby-Fell (2016) demonstrated that personal factors (e.g. understanding resilience and overall well-being), along with contextual factors (e.g. relationships with colleagues and supervisors) influence the amount of resilience that teachers demonstrate within their careers. Jennings and colleagues (2017) claim that professional training that improves teachers' emotion regulation skills also increases emotional support within the classroom. Jennings and colleagues introduced an intervention program entitled *Cultivating Awareness and Resilience in Education* (CARE), which includes instruction on emotion regulation skills, mindful awareness skills, and empathetic listening skills. Participation in the CARE program provided teachers with increased

levels of emotion regulation and mindfulness, and decreased levels of psychological distress (Jennings et al., 2017). This program presents the foundations of mindfulness and social emotional skills with a direct focus on application for teachers in classrooms.

Stressors. Teachers must navigate these stressors to best create classroom environments that aid in students' success. There are various stressors found within the school system, such as when limited resources dictate the amount spent on equipment and lesson materials for the classroom. Also, disruptive student behavior can interrupt lessons and cause difficulty in managing classrooms. Using self-reports from over 1,000 teachers in elementary, middle, and high schools, Skaalvik and Skaalvik (2017) collected data on the perception of various established stressors within the schools. These stress factors are found in varying amounts in every school and can lead to the negative symptoms of burnout for school staff. Skaalvik and Skaalvik identified four major stressors that impact teacher performance and satisfaction: discipline problems, time pressure, low student motivation, and value dissonance. These stressors were then related to three areas of teacher burnout, including emotional exhaustion, depersonalization, and personal accomplishments. Significant findings include a positive relationship between time pressure (or work overload) and emotional exhaustion, and an influence of the teacher-student relationship on depersonalization and feelings of personal accomplishment. This research suggests that various stressors within the classroom are related to aspects of school climate, teacher burnout, and teacher satisfaction.

Carson, Baumgartner, Ota, Kuhn, and Durr (2017) conducted an ecological momentary assessment of burnout among childcare teachers, finding a relationship between stress, job satisfaction, and quitting intention. The results included a positive relationship between the amount of emotional exhaustion teachers felt and the intention of quitting. Researchers have

suggested that the emotional stress associated with teaching is at least partially responsible for the high turnover rate of teachers (e.g., Hale-Jinks, Knopf, & Kemple, 2006). By introducing teacher training in emotional regulation and other coping strategies, the burnout and turnover rates of teachers may be improved.

Burnout. Teachers must be prepared to face daily stressors due to the nature of their profession. Unfortunately, professions with high levels of stress often lead to an increased number of burnout symptoms. Symptoms of burnout include chronic fatigue, emotional exhaustion, insomnia, anxiety, depression, and even an increased risk of illness. Burnout is associated with poorer quality teaching due to exhaustion and negative emotions (Klusman et al., 2008). Wong, Ruble, Yu, and McGrew (2017) found the sense of accomplishment teachers report is directly related to educational outcomes for students receiving special education services. This suggests that symptoms of burnout (i.e., low personal accomplishment) may interfere with student success. Wong and colleagues (2017) also suggested that other symptoms of burnout, including perceived stress, emotional exhaustion, and depersonalization, were negatively related to student success. Richards, Levesque-Bristol, Templin, and Graber (2016) revealed that stressors associated with the role of teaching (i.e., conflict, work overload, and role ambiguity) increased the symptomology of burnout among teachers; however, resilience acted as a protective factor against feelings of burnout. Another study by Richards, Hemphill, and Templin (2016) interviewed teachers and demonstrated that although all reported dealing with workplace stressors, those who showed low-levels of burnout perceived the work environment as supportive, while those who showed high-levels of burnout perceived a hostile work environment. These two studies suggest that promoting teacher resilience and a positive school environment may help reduce feelings of burnout and promote teacher retention.

There are two major approaches to preventing the negative symptoms of burnout among teachers. First, social support may be provided within the school to alleviate the burden of the profession. This can include structured groups, training for teachers and staff, and community-based programming that allows teachers to form positive relationships with each other outside the workplace. Research suggests that administrative support positively relates to teachers' intent to stay in the field (Cancio, Albrecht, & Johns, 2013). A second approach to prevent the negative symptoms of burnout among teachers is to provide education about emotional intelligence and adaptive coping skills for feelings of stress. Mérida-López and Extremera (2017) looked at teacher burnout and emotional intelligence and results showed a negative association between emotional intelligence and teacher burnout. This suggests that education or targeted training for teachers to increase emotional intelligence is likely to result in fewer symptoms of burnout. Herman, Hickmon-Rosa, and Reinke (2018) established that teachers who reported high levels of stress and low levels of coping showed the worst student outcomes compared to teachers with different levels of these measured variables. A meta-analysis by Iancu, Rusu, Măroiu, Păcurar, and Maricuțoiu (2018) revealed that interventions aimed at reducing symptoms of burnout among teachers have variable, but positive, effects. Strongest effects showed decreased emotional exhaustion and increased personal accomplishment, and researchers concluded that mindfulness is one intervention that acts as a moderator for the improvement of these burnout symptoms. Finally, Väisänen, Pietarinen, Pyhältö, Toomd and Soinie (2018) indicated that proactive coping strategies served as a buffer against the feelings of burnout among student teachers.

Coping. Coping with stress is important to combat negative side effects, such as the development of burnout symptoms. Loon, Heerema, Weggemans, and Noordegraaf (2018)

showed that a higher level of coping among teachers was related to higher work engagement and lower intent to leave the field, compared to teachers with relatively low levels of coping. A strategy for coping with emotions that has demonstrated efficacy against stress and burnout is self-regulation (e.g., Pas, Bradshaw, & Hershfeldt, 2012; Mansfield, Beltman, Broadley, & Wetherby-Fell, 2016). Through a process of identifying and understanding emotions, self-regulation allows individuals to acknowledge the emotional responses they are feeling and attempt to regulate, or change, the expression of the emotion. Self-regulation equips individuals with the tools necessary to respond to various emotional states; for example, when feelings of anxiety arise, self-regulation strategies can be employed to relieve or redirect the energy in a productive way.

Furthermore, Jeon, Hur, and Beuttner (2016) investigated the links between teacher coping and responsiveness to students in the classroom. Researchers revealed that teachers who perceive the classroom as a chaotic environment were less likely to use reappraisal skills (e.g., self-regulation) and showed less positive responsiveness to students. This suggests that teachers with higher levels of coping skills may be better prepared to handle the chaos of teaching. Zurlo, Pes, and Capasso (2016) showed that the ability to focus on the problem, on innovation, and on pastime hobbies was the best defense against stress-related burnout. Furthermore, Jiang, Vauras, Volet, and Wang (2016) demonstrated that students' perceptions of their teachers' emotion regulation was associated with the teachers' self-report, suggesting that students are aware of how their instructors handle their emotions. Jiang and colleagues also found that reappraisal was more effective at increasing the expression of positive emotions among teachers compared to suppression, which increased negative emotions.

To increase coping skills and emotion regulation in teachers, Justo, Andretta, and Abs (2018) used a dialectic behavioral therapy skills training session. The training was designed to act as continuing education, rather than the typical application of dialectic behavioral therapy in treating psychopathology. Teachers were trained on mindfulness as a “skill to help develop the five social-emotional competencies of self-awareness, self-management, social awareness, relationship skills, and responsible decision making” (Justo, Andretta, & Abs, 2018, p. 3). Researchers claimed that this approach to teacher training showed increased emotional awareness during the intervention period and concluded that the skills gained could apply to the classroom through an improved ability to explain emotions to children. Thus, teacher training in emotion regulation could directly influence the emotional development of students.

Many emotion regulation strategies actively attempt to change the experience of emotion; a process that begins with an awareness of emotions. Alternatively, mindfulness-based practices focus on the awareness of emotions without judgment or attempts to change the emotion. Although both mindfulness and reappraisal appear useful for coping with stress, each has distinguishing characteristics (Hayes-Skelton & Graham, 2013). Mindfulness-based interventions may have useful application within teachers’ training and daily routines on the job.

Pre-Service Teachers. Prior to licensure and the first-year of independently teaching a classroom of students, pre-service teachers go through formal education and practical experience (i.e., student teaching or practicum). Pre-service teachers learn ways to structure lessons, how student behavior is guided and managed in the classroom, and the utility of stress-management related to the career. Klassen and Chiu (2011) looked at the influence of self-efficacy and stress play in commitment and intention to quit for both pre-service teachers and practicing teachers. They revealed that both groups of teachers (i.e., practicing and pre-service) report similar factors

that influence commitment to the career and the intention to quit. Self-efficacy, job stress, and teaching context were shown to play important roles in reported intention to quit and commitment to the field of teaching (Klassen & Chiu, 2011). This suggests that pre-service teachers are aware of and beginning to feel the stressors related to the career of teaching.

Pre-service teachers deal with stress from their jobs but may not always be equipped to cope with high levels of stress. Geng, Midford, and Buckworth (2015) demonstrated that their sample of pre-service teachers across early childhood, primary, and secondary education levels all reported higher-than-average stress levels. These findings are congruent with Chaplain (2008; p. 205) that “38% of the trainees [...] felt that their teaching experience had been very or extremely stressful.” Chaplain explained that three factors contributed to the perception of stress: behavior management, workload, and lack of support. The research with pre-service teachers suggests that, similar to teachers in the field, many experience high levels of stress, often related to the job of teaching in the classroom. Paquette and Rieg (2016) asked pre-service teachers to report stressors they encounter in their student-teaching practicum; researchers exposed main themes of stressors related to work overload, communication, and classroom management and discipline. Difficulties with effective communication and classroom management appear to compromise a large amount of stress reported by pre-service teachers.

The stress levels of pre-service and first-year teachers may play a critical role in understanding the high rate of teacher attrition and burn-out. Cross and Thomas (2017) identified a possible method of mitigating the burnout among teachers, arguing that the first years of teaching are the most critical for teachers to build confidence and efficacy in their teaching. Cross and Thomas proposed that specialized support among novice teachers should be created to increase social support and effective stress management for teachers.

Mahmoudi and Özkan (2016) suggested that stress and coping strategies be integrated into education programs to increase the efficacy of student teacher training. Mahmoudi and Özkan found that majority of stress reported by practicum (pre-service) teachers was related to supervisor and mentor teacher relationships. Such themes, including not enough feedback and high expectations when delivering a lesson, were gathered from qualitative reports collected through semi-structured interviews. Researchers suggested that although all pre-service teachers reported that coping strategies were used to deal with stress, “only some of the pre-service language teachers were successful in choosing and using strategies in coping with their stresses” (Mahmoudi & Özkan, p. 499). These findings suggest that pre-service teachers are feeling stressed during their student-teaching rotations, and that although they realize the importance of effective coping strategies, few have enough practice coping with stress to effectively select and implement coping strategies in the moment. If unable to effectively cope with the stressors of the job, teaching efficacy may decrease.

Much of the research aimed at pre-service teachers focuses on the self-efficacy of their teaching (e.g., What factors influence how well a teacher feels they are able to teach the required materials to a group of students?). Brown, Lee, and Collins (2015) pointed out the importance of the student teaching experience for pre-service teacher’s sense of efficacy. This study evaluated the level of preparedness and sense of teaching efficacy to show that both significantly increased after pre-service teachers completed their student teaching. Furthermore, Brown and colleagues found that the opportunity for hands-on teaching was among the most commonly reported learning component identified by pre-service teachers. This suggests that the opportunity to practice skills learned during teacher education is vital to a pre-service teacher’s sense of self-efficacy and preparedness for the first-year of teaching. Additionally, McLennan, McIveen, and

Perera (2016) found that pre-service teachers' sense of self-efficacy positively predicted their optimism about their career. Researchers concluded that that professional learning and teacher education should be aimed to improve teachers' sense of self-efficacy.

The type of emotional intelligence skills that pre-service teachers demonstrate is of interested to researchers. Corcoran and Tormey (2013) looked at how emotionally intelligent pre-service teachers are using assessment of overall emotional intelligence (EIQ), along with sub-scores in Perceiving Emotions, Facilitating Thought, Understanding Emotions, and Managing Emotions. Overall, Corcoran and Tormey showed that pre-service students have lower-than-average EIQ; with a relative weakness in Understanding Emotions and Perceiving Emotions, and strength in Facilitating Thought and Managing Emotions. This suggests that pre-service teachers may have some foundational social-emotional skills that could be enhanced through targeted training.

Although emotional intelligence alone does not predict student teachers' performance, social skills and emotional intelligence may play an important role in pre-service teacher education (Palomera, Briones, Gómez-Linares, & Vera, 2017). Palomera and colleagues used a quasi-experimental design to explore the effects of a social skills training for pre-service teachers. Student teachers who received the training showed greater confidence and less fear of public speaking, including when teaching a classroom of students. The researchers pointed out that social-emotional skills play an important role in preparing pre-service teachers for the stresses of independent classroom management. Zimmerman (2018) suggests including mindfulness in teacher education as a "powerful tool...[to]...improve novice teacher resilience in the face of the stress, tension, and vulnerability that accompanies the endeavor of learning to

teach” (p. 59). Training pre-service teachers in the theories of mindfulness and as a strategy for stress management in the classroom may be helpful to improve outcomes for new teachers.

Mindfulness

John Kabat-Zinn (1994) defined mindfulness as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” as part of *Mindfulness-Based Stress Reduction* (p. 4). Kabat-Zinn introduced this traditionally Eastern philosophy into the Western scientific community through *Mindfulness-Based Stress Reduction* (MBSR), an 8-week stress reduction intervention program. Mindfulness is often measured by awareness of the present moment and a lack of judgment about the experience in the moment (e.g., Mindful Attention Awareness Scale, MAAS; Brown & Ryan, 2003). Furthermore, Bishop and colleagues (2004) argued that these two features (i.e., awareness and non-judgment) are key in the operationalization of mindfulness within scientific inquiry. The separate components of defining mindfulness can have differential effects on affect. For example, Blanke, Riediger, and Brose (2018) found that the facet of nonjudgement was associated with less negative affect, while the facet of present-moment attention was associated with more positive affect. Together, the components of mindfulness have been found to have significant results from initial and prolonged exposure. MBSR includes building the skills of this unique type of awareness along with practice in meditation and other mindfulness exercises. Mindfulness training has shown to be effective in treating symptoms of Post-Traumatic Stress Disorder (e.g., Stephenson, Simpson, Martinez, and Kearney, 2017), anxiety and depression (e.g., Alisaleh & Ghahari, 2017), and even increasing the working memory capacity of children (Quach, Mano, & Alexander, 2016). In a review of literature surrounding mindfulness and neurocognitive processes, Perestrelo and Teixeira (2016) found that mindfulness may be effective in treating mental health disorders (e.g.,

depression, anxiety) due to an improved ability to regulate emotions. Additionally, research suggests that individual traits may influence mindfulness practice, such as coping style. Sears and Kraus (2009) found that coping style mediated the relationship between meditation practice and positive outcomes (e.g., lower anxiety). This suggests that coping style affects the effectiveness of mindfulness.

Similar to a personality trait, mindfulness can be conceptualized as an overarching trait, which is relatively stable across time and place. Various self-report measures have been created to capture trait-mindfulness. For example, the MAAS (Brown & Ryan, 2003) focuses on measuring trait mindfulness as attention and awareness of the present moment but does not capture other aspects of mindfulness. Alternatively, the Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) includes the subscales of observing, describing, acting with awareness, non-judgment, and non-reactivity, but subscales are not always found to be significantly correlated, as would be expected in a measure with stronger psychometric properties (Mandal, Arya, & Pandey, 2016).

Critiques of the trait-mindfulness conceptualization cite these inconsistencies and argue that mindfulness should be operationalized as simply a state of being. Importantly, Bravo, Pearson, Wilson, and Witkiewitz (2018) demonstrated that the association between trait- and state- mindfulness is inconsistent across levels of experience, such that there is a strong association for individuals with greater mindfulness experience. This suggests that mindfulness is a skill that can cultivate into a trait across time. It would follow that the earlier a person learns the skills required to practice mindfulness, the better they are able to integrate the skills into their daily lives, including their professional career. Teacher education can encompass coping skills, such as mindfulness, to allow integration into practice prior to experiencing the stress of first-

year teaching. Many authors argue that the increased skill in awareness makes it difficult to track changes in trait-mindfulness (e.g., Grossman, 2011). It is possible that as people gain awareness of their own inattention, they may self-report lower levels of trait-mindfulness. One mechanism that has been proposed for the change in trait-mindfulness is the cultivation of depersonalization of experiences, or decentering (e.g., Hayes-Skelton & Graham, 2013). Decentering is the ability to de-identify oneself from the thoughts, emotions, and experiences that one has throughout their day and life. Although a distinct concept, decentering relates to mindfulness and the cultivation of different traits. Noguchi (2017) would likely agree with this cultivation process of skills and argued that an end-state for mindfulness can be captured through a self-report measure. Although this validation research was robust, further research into end-state mindfulness must be completed before accepting it as part of the construct.

Alternative to a *trait*, which may be very slow to change, some researchers have identified *state*-mindfulness as something that changes in the moment due to a specific action (e.g., Egan, Hill, & Foti, 2017). State-mindfulness is often measured using self-reports, such as the Toronto Mindfulness Scale (TMS; Lau et al., 2006). In the operationalization of mindfulness, Bishop and colleagues (2004) argued that mindfulness is “much closer to a state than a trait” due to the immediate changes following a mindfulness practice (p. 234). Mindfulness interventions, such as a 5- or 10-minute guided meditation, have been shown to significantly increase state mindfulness compared to control groups (e.g., Luberto & McLeish, 2018; Mahmood, Hothrow, & de Moura, 2016). Brief mindfulness exercises have also shown to improve cognitive functioning, such as a reduction in false memory during recognition tasks (e.g., Lloyd, Szani, Rubenstein, Colgary, & Pereira-Pasarin, 2016). This study elicited memory for specific stimuli (i.e., words) and found that a 3-minute exercise in mindfulness after exposure, but prior to recall,

reduced participants false memory for stimuli not presented (Lloyd, et al., 2016). Although not a formal measure of state-mindfulness, the immediate effects of a brief mindfulness activity are evident on mental processes.

Mindfulness-based social-emotional learning programs instruct individuals to be aware of their emotions without judging the emotion or allowing the emotion to disrupt their behavior. Formal mindfulness-based practices have been incorporated with many other therapeutic treatments for a wide range of psychological distress, and often include 8 to 10 week-long intervention programs (e.g., MBSR). Researchers, such as Snippe, Dziak, Lanza, Nyklíček, and Wichers (2017) argued that there is a dose-response to mindfulness. The more practice one completes, the more positive effects one may experience. However, many schools and teachers do not have the time to introduce long mindfulness sessions over the course of multiple months. Rather, informal and brief interventions of mindfulness may be more applicable to the school setting, due to the relatively short nature of the activities. Brody, Scherer, Turner, Annett, and Dalen (2018) focused on informal mindfulness practices as a useful way to integrate the practice into family therapy, suggesting that informal practices are especially practical for use with children. Morgan, Graham, Hayes-Skelton, Orsillo, and Roemer (2014) determined that informal practice was instrumental to sustaining improvement in mindfulness and the reduction of symptoms associated with Generalized Anxiety Disorder. At 6-, 9-, and 12-month follow-up, participants with higher levels of informal practice showed the greatest retention of positive outcomes after a mindfulness intervention (Morgan, et al., 2014). Informal and brief mindfulness practices can show similar results to formal mindfulness training. For example, Poulin, MacKenzie, Soloway, and Karayolas (2008) compared a brief mindfulness exercise to a relaxation intervention and showed that both are effective at reducing stress levels among human

services workers. Mindfulness practice should be made accessible to the individual through a variety of practice routines that can be easily integrated into one's daily routine. However, limited research has been conducted to understand the effectiveness of informal practices of mindfulness with teachers.

Psychoeducation is a common component of mindfulness interventions used with a variety of populations, including teachers. Concepts of mindfulness must be adequately understood before the skills can be practiced and improved. The length of psychoeducation programs varies greatly within research. For example, Gold, Smith, Hopper, Herne, Tansey and Hulland (2010) used an 8-week *Mindfulness-Based Stress Reduction* (MBSR) program for educating primary-school teachers on stress relief and mindfulness such that teachers completed weekly sessions that lasted 2.5 hours, in addition to a 5-hour weekend retreat, for a total of 25 hours. During this time, participants would review homework, discuss strategies for maintaining a mindfulness practice, and complete a psychoeducation session lead by a specialist. This program was adapted for a teacher population but was based on the syllabus described by Kabat-Zinn (1990). Gold and colleagues found that MBSR statistically improved teachers' reports of depression and stress. Additionally, Flook, Goldberg, Pinger, Bonus, and Davidson (2013) investigated the effect of MBSR for a teacher sample, reporting that participants spent an average of 21.7 minutes per day in formal mindfulness practice, and an additional 7.5 minutes per day in informal practice. The outline for MBSR integrates psychoeducation with mindfulness practice, homework assignments for participants, and reflection on each participants' mindfulness practice. Although research suggests this program is effective for combatting the symptoms of stress and burnout, little research has been conducted for treatment programs which do not require high doses of training. Zimmerman (2018) argues that teacher education could

benefit from introducing mindfulness training for pre-service teachers. The contemplative practice may give novice teachers greater in-the-moment awareness about their students and their own behavior in managing and teaching students. Specifically, mindfulness evokes nonjudgement, which Zimmerman argues may play a role in the formation of teacher-student relationships.

Mindfulness for students. Mindfulness-based social emotional learning programs instruct individuals to be aware of their emotions without judging the emotion or allowing the emotion to disrupt their behavior. This is especially useful in schools to empower students to check in with their emotional state and recognize when they are getting “worked-up.” This type of social-emotional education supports students to equip them with the skills necessary to identify their emotions and select an appropriate response to their feelings. Research supports the utility of mindfulness-based programs at improving students’ attention (e.g. Napoli, Krech, & Holley, 2005), executive functioning (e.g. Flook, et. al. 2010), working memory capacity (Quach, Mano, & Alexander, 2016), and social skills (e.g. Liehr & Diaz, 2010). This suggests that mindfulness interventions have a wide range of positive effects on students in the schools. Felver, Celis-de Hoyos, Tezanos, Singh (2016) conducted a systematic review of mindfulness-based interventions used within the schools and found that most interventions are carried out in students’ classrooms during school hours; however, there was variation in the length of the intervention sessions and total time spent in intervention. The outcome measures varied across studies, showing a range of positive outcomes from reducing behavioral problems to improvements in executive functioning (Felver, et al., 2016). Researchers concluded that the literature reviewed was strong to support the utility of mindfulness-based practices within the

schools for a wide range of student populations. However, future research should utilize an active control group to understand fully the effect of mindfulness on children in the schools.

Although most research has been conducted within individual classrooms, there are some schools that adopt school-wide intervention programs in mindfulness. Skeinman, Hadar, Gafni, and Milman (2018) investigated three Israeli schools that had been using a school-wide mindfulness-based intervention for a range of 1-13 years. This implicates the utility of school-wide programs that teach mindfulness to all students. Liehr and Diaz (2010) conducted a pilot study using the *Mindful Schools* program with 2nd and 3rd graders. These researchers found that students improved their social skills and attentional control, which was maintained at a 3-month follow-up. This suggests that mindfulness-based programs can be useful for improving various aspects of school climate and academic performance.

Mindfulness for teachers. To promote healthy and happy classrooms, teachers must feel supported and have the proper training to support the emotional development of their students. Hoffman, Hutchinson, and Reiss (2009) found that early childhood teachers had a more positive feeling about their job and the school climate after being trained in a mindfulness-based emotional intelligence program. Their curriculum, entitled “*Conscious Discipline*,” included releasing external control, embracing conflict resolution, and implementing emotion-targeted reward systems within the classroom. Other organizations have developed curriculum that address mindfulness specifically within the school systems. In addition, Minfulschools.com provides training for teachers and school staff to incorporate mindfulness into their lessons and interactions with students. For example, Beshai, McAlpine, Weare, and Kuyken (2016) used a mindfulness-based intervention to combat stress and anxiety among teachers. Researchers demonstrated that the majority of teachers (95%) found the intervention to be useful, and

participants in the intervention group showed a reduction in perceived stress and an increase in well-being compared to the control group. In addition, Poulin, Mackenzie, Soloway, and Karayolas (2008) demonstrated that teachers-in-training who received education on mindfulness practices reported higher levels of satisfaction with life and teaching self-efficacy, compared to a control condition. In this study, teachers in the mindfulness-condition also indicated high utility of mindfulness skills reported immediately following the mindfulness education and during the first year of teaching. In a systematic review of mindfulness interventions for teachers, Hwang, Bartlett, Greben, and Hand (2017) found that although there is limited research using mindfulness among teachers, a large portion of studies used mindfulness as an intervention to promote well-being and teacher performance. Additionally, researchers found that many mindfulness interventions were aimed at reducing the negative side effects of stress and burnout. Considering the evidence to support mindfulness as a skill, which is developed over time (e.g., Wilson & Witkiewitz, 2018), research should focus on teaching early career or pre-service teachers mindfulness skills, which can be integrated into the classroom. Mindfulness training may be especially useful for pre-service teachers who are learning many other classroom skills. As pre-service teachers begin their training, mindfulness can be one of many tools introduced to aid in the daily responsibilities of teaching. Zimmerman (2018) argues that adding the thoughtful and effective coping style of mindfulness to the image of being a “professional teacher” may change how teachers see their roles in the classroom. Guided by nonjudgment and in-the-moment awareness, pre-service teachers may be better prepared to face daily stressors and establish effective behavioral management techniques. Ultimately, the strategies that individuals bring into the first years of their career can help shape the habits they form; for teachers, this means classroom management techniques, coping with stress, and self-care.

Mindfulness-based practices may be useful to combat the negative side effects of stress and burnout among teachers and pre-service teachers. Flook, Goldberg, Pinger, Bonus, and Davidson (2013) found that teachers who participated in a modified MBSR training showed decreased levels of stress and relatively fewer signs of burnout compared to a control group. Similarly, when primary school teachers were trained with MBSR, they showed improvements on measures of anxiety, depression, and stress (Gold, Smith, Hopper, Herne, Tansey, & Hulland, 2010). Roeser and colleagues (2013) found that teachers who received mindfulness training reported lower levels of stress and burnout, higher levels of attention control, and high occupational self-compassion post-intervention, compared to a wait-list control group. Researchers present a theory of change in which teachers show an increase of emotional intelligence following mindfulness education and embody resilience against the daily stress of teaching. In two randomized trials of this theory, Roeser and colleagues found evidence to support that mindfulness training can increase emotional intelligence in teachers and reduce symptoms of burnout. Brown (2017) introduced mindfulness to pre-service teachers and found qualitative evidence to support the utility of mindfulness-based interventions among teachers, suggesting that teachers may be open to learning new coping strategies that can be integrated into their daily lives. Despite these findings, further research is required to understand the utility of mindfulness-based interventions that aim to support teachers' ability to cope with daily stressors.

In addition, mindfulness interventions must be conducted with adequate empirical support and fidelity. Systematic reviews of the literature have found that few studies report on the fidelity of mindfulness interventions for teachers (Hwang, Bartlett, Greben, & Hand, 2017; Lomas, Carlos Medina, Ivztan, Rupprecht, & Eiroa-Orosa, 2017). Eva and Thayer (2016) argued

that the increase in well-being associated with mindfulness-based practices can be supported through daily practices and accessible resources for mindfulness practice (e.g., books, apps, audio recordings). Additional research should investigate ways to promote a daily practice of mindfulness for teachers, including the fidelity of mindfulness interventions.

Jennings (2016) developed the *Cultivating Awareness and Resilience in Education* (CARE) program as a mindfulness-based professional development program for teachers and school staff. This program is offered as a 4-5-week course or an intensive 5-day retreat through the Garrison Institute. At its core, CARE instructs teachers on instruction of emotional skills, mindfulness and stress reduction, and compassion and listening. This program, like MBSR, utilizes psychoeducation as a central component for teaching the skills of mindfulness and reflecting of the utility of stress relief within various settings. Ultimately, the goal of psychoeducation is to provide foundational understand and practical experience with new topics.

Ecological Momentary Assessment

Ecological momentary assessment (EMA) is a sampling technique that enables researchers to collect responses from participants throughout a typical routine. Participants remain in their typical environment, such as at home or in the workplace, and are requested to respond to self-report questionnaires or otherwise engage with experimental procedures at random or set intervals throughout the day. Modern methodology utilizes technology such as smartphones, personal digital assistants, and email. EMA, also referred to as experience sampling, has influenced scientific understanding of a wide range of psychological disorders, such as major depression disorder (Telford, McCarthy-Jones, Corcoran, & Rowse, 2012), substance abuse and craving (Swendsen, Serre, Fatseas, & Auracombe, 2014), post-traumatic stress disorder (Chun, 2016), hallucinations associated with schizophrenia (Schlier, Winkler,

Jaya, & Lincoln, 2018), and eating disorders (Druschinin, Fuller-Tyszkiewicz, De Paoli, Lewis, & Krug, 2018). Van Berkel, Ferreira, and Kostakos (2018) argued that experience sampling, or EMA, reduces the reliance on participants' long-term memory by allowing them to complete self-reports at the time of, or closely after, the event of interest. This suggests that EMA is a useful way to collect data on the daily experiences of individuals. Specifically, SurveySignal is an online tool used by researchers to send signals directly to participants' smartphone devices. Hofmann and Patel (2015) reviewed eight studies that used SurveySignal to investigate response patterns of participants. On average, survey completion rate was 96.4% and retention rate 89.4%. EMA using participants' smartphones allows researchers to complete experience sampling with an effective and reliable method. However, not all studies using EMA show such high acceptability of responses. In a study with patients with psychotic-spectrum disorders, Moitra, Gaudiano, Davis, and Ben-Zeev (2017) found that participants completed only 28-31% of EMA assessments offered. It appears that this method of data collection has both benefits and limitations to retention.

Research on teachers' mental health and coping in the schools has benefited from EMA as a unique methodology. For example, Carson, Baumgartner, Ota, Kuhn, and Durr (2017) used EMA to assess teacher stress level at three times throughout the day (morning, after lunch, and end of day) for a one-week interval. Teachers reported on stressors and methods of coping, job satisfaction, and intention to quit. Carson and colleagues found that around 53% of teachers reported using multiple strategies between prompts. There was also a significant positive correlation between teacher reported mental, physical, and emotional exhaustion and end-of-day quitting intentions. The use of EMA can help researchers understand how teachers cope with daily stressors and ways to introduce effective interventions.

Mindfulness research has recently adopted EMA as a useful tool to study the change across practice time and location. Ruscio, Muench, Brede, MacIntyre, and Waters (2016) used an EMA model to introduce brief-mindfulness activities into the daily lives of community smokers; their results indicate that EMA is a feasible way to both collect data on stressors throughout the day and deliver mindfulness-based interventions. In this study, participants received personal digital assistant (PDA) devices, which prompted a 20-minute meditation once per day for ten days. Ruscio and colleagues determined feasibility of the intervention through compliance rate, where participants in the experimental condition completed 75% of the prompted meditations. The PDAs also prompted participants four times per day at random intervals to complete a self-report state mindfulness questionnaire, along with a cognitive measure of mindfulness. Ruscio and colleagues found that the mindfulness meditation interventions significantly increased state-mindfulness compared to a sham-meditation control. The use of EMA in this study allowed researchers to prompt participants to engage in mindfulness within their natural environments. This may allow participants to better generalize mindfulness practices into their daily living, thus boosting the utility of a mindfulness-based intervention.

Moore, Depp, Wetherell, and Lenze (2016) compared traditional methods of data collection (pen and paper) to EMA for a mindfulness-based stress reduction program for adults with emotional distress, such as depression and anxiety. Participants were recruited for an in-person screening followed by an EMA at-home data collection that consisted of various measures of mindfulness and related factors 3-times per day for 10-days. The initial EMA collection period was followed by treatment (i.e., mindfulness-based stress reduction) or control (i.e., general health education) and a second round of EMA at-home data collection. Researchers found that the effect size for measures administered with EMA was higher than the effect size for

the paper and pen measurements taken only at pre- and post- treatment. Additionally, significantly different increases in mindfulness and decreases in depression and anxiety for the treatment group compared to the control group were seen in the data collected through EMA and not in the traditional pen and paper measurements. This suggests that EMA data is more sensitive to changes in mindfulness and depression following a mindfulness-based treatment. Researchers concluded that the use of EMA as a method of data collection boosted the performance of a mindfulness-based stress reduction treatment. Thus, EMA data collection is an optimal option for researchers investigating the effect size and maintenance of mindfulness-based practices. EMA was selected for this study to optimize the rate of change in stress and mindfulness, as well as measuring treatment fidelity and stress management techniques.

Rationale for Current Study

The school environment houses a multitude of factors that contribute to the success of students. To create welcoming learning environments, teachers must actively shape their classrooms to suit students' needs (Jennings & Greenburg, 2009). However, teachers face many stressors within their working environments that hinder job performance and mental health (e.g., Jiang, Vauras, Volet, & Wang, 2016). Further research must be conducted to establish effective interventions for teachers facing stress and burnout. Mindfulness is an accessible and effective way to increase emotional intelligence and combat stress and burnout (Jennings et al., 2017). However, limited research has introduced mindfulness to pre-service teachers to prevent the experience of stress and burnout when teaching. Rus (2017) found mindfulness psychoeducation was perceived to be useful to pre-service teachers but failed to track teacher engagement with mindfulness. Ecological momentary assessment has been used as a method of introducing and tracking participation in a mindfulness intervention for adult populations (Ruscio, Muench,

Brede, MacIntyre, & Waters, 2016). Building upon the methodology of previous research, a mindfulness intervention will be presented to pre-service teachers to reduce symptoms of burnout and stress and reveal the perceived utility of mindfulness in the classroom.

Pre-service teachers have yet to establish classroom management strategies and serve as a population of target for preventative interventions. There are many researchers who focus on teacher retention within the first few years of teaching (e.g., Cross & Thomas, 2017). This early career success may shape the long-term satisfaction and wellbeing of teachers. The stressors faced by pre-service teachers differ from the stressor present in the school setting; however, the skills established by pre-service teachers may carry over into the classroom. In this way, preparing teachers-to-be for the stressors of working in the schools may include mindfulness and other psychological training aimed at reducing stress and symptoms of burnout. Thus, this study used a sample of teachers-in-training, who were currently enrolled at the University of Montana.

This project aimed at understanding the utility of mindfulness practice for pre-service teachers. First, the goal of psychoeducation was to provide a foundation upon which a mindfulness practice may be built. It was hypothesized that participants would understand what mindfulness is, potential benefits from mindfulness practice, and ways that mindfulness can be incorporated into their daily lives. The psychoeducation in this study blended common components of *Mindfulness-Based Stress Reduction* (MBSR; Stahl & Goldstein, 2010) and *Cultivating Awareness and Resilience in Education* (CARE; Jennings & Siegel, 2015). Throughout two sessions, participants discussed common stressor and stress relief methods, practiced mindfulness exercises, and reflected upon the utility of mindfulness for stress relief in their daily lives and future career. Sessions that seem approachable and manageable to participants may be completed with higher fidelity. Thus, this study designed psychoeducation to

fit the format of the existing schedule for pre-service teachers. One-week of psychoeducation served as a brief and intense introduction into the theoretical foundations of mindfulness and demonstration of how mindfulness can be incorporated into daily living.

A second goal of this study was to use EMA as an intervention tool to influence the frequency of engagement with mindfulness. A daily reminder was hypothesized to encourage individuals to practice mindfulness and serve to increase the likelihood of future mindfulness practice. Cultivating a mindfulness practice evolves over time and a daily prompt to engage in mindfulness may encourage the growth of a mindfulness habit. Given these goals, the following research questions will be examined in this study.

Research Questions

Research Question 1: Does 100-minutes of psychoeducation on mindfulness increase awareness and understanding of mindfulness?

H1: After 100-minutes of psychoeducation, participants will write significantly more accurate descriptions of mindfulness, including at least one more component of the operational definition compared to definitions written prior to psychoeducation.

Research Question 2: Does a daily reminder to practice mindfulness change mindfulness practices among pre-service teachers?

H2: Participants who receive a reminder to practice mindfulness will show a significantly higher mean-frequency of practicing mindfulness in a given period of six consecutive responses compared to a control group during the same period, as measured by self-reported stress relief strategies and fidelity check for the treatment group.

Research Question 3: Does engagement with mindfulness differentially affect stress levels among pre-service teachers?

H3a: Higher frequency of mindfulness practice, as measured by whether participants report *yes* to the fidelity check or select mindfulness as a stress-relief strategy, will be significantly negatively associated with mean levels of stress on a self-report measure of momentary stress on average for a given period of six consecutive responses.

H3b: Higher frequency of mindfulness practice, as measured by whether participants report *yes* to the fidelity check or select mindfulness as a stress-relief strategy, will be significantly negatively associated with mean levels of stress on the Perceived Stress Scale at post-test.

Research Question 4: Does engagement of mindfulness differentially affect reported levels of state-mindfulness among pre-service teachers?

H4: Higher frequency of mindfulness practices, as measured by whether participants report *yes* to the fidelity check or select mindfulness as a stress-relief strategy, will be significantly positively associated with mean levels of self-reported state-mindfulness as measured by the Toronto Mindfulness Scale.

Chapter III: Method

Participants

Undergraduate students enrolled in the College of Education and Human Sciences at the University of Montana in training to become teachers were recruited to participate in this study as a sample of pre-service teachers. Students in an integrated health course received one-week of psychoeducation as part of their course curriculum, all students in attendance were given the option to participate in the current study. Students were told that participation would inform future psychoeducation for teachers and may involve being asked to practice the skills being taught in psychoeducation. It was initially proposed that participants would be assigned into one of two groups using a matched random assignment procedure based on a stratified matching of trait-mindfulness. However, not all participants had completed the measure of trait-mindfulness upon randomization into treatment and control groups. Thus, participants were randomly assigned into treatment and control groups. To increase the overall number of participants for the proposed analyses, recruitment was split into two parts. Part 1 of the study consisted of collecting data associated solely with psychoeducation. 30 participants signed informed consent for Part 1 of the study; however, due to incomplete data, the final sample size for Part 1 was $N = 24$. Part 2 of the study consisted of collecting data on trait mindfulness and EMA data on stress levels, mindfulness practice, and state mindfulness. Sixteen participants signed informed consent for Part 2 of the study; however, due to participant dropout, the final number of participants was $N = 6$.

Measures

Trait-mindfulness. Trait-mindfulness was assessed using the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003; see Appendix B). The MAAS uses 15

statements, such as “I forget a person’s name almost as soon as I’ve been told it for the first time,” rated on a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). Brown and Ryan (2003) validated the MAAS for use among general populations of adults and college students and the internal consistency was found to be adequate, ranging from .80 to .90. A mean score is computed for the MAAS, with higher scores indicating higher levels of trait mindfulness. The MAAS was selected as a measure of trait-mindfulness based on the overall measure of mindfulness and internal consistency. Overall trait-mindfulness may impact the likelihood of participants engaging in mindfulness or the levels of state-mindfulness and should be assessed in each sample as it relates to generalizability to other populations. The mean score for the MAAS for this study was $M = 3.36$ ($SD = 0.50$). The internal consistency for the MAAS in this study was $\alpha = 0.66$. This is considered a moderate association, and may be influenced by sample size, such that a larger sample of pre-service teachers may have a stronger internal consistency.

State-mindfulness. State-mindfulness was assessed using the Toronto Mindfulness Scale (TMS; Lau, et. al. 2006; see Appendix D). The TMS uses 13 statements, such as “I was curious about my reactions to things,” rated on a 5-point Likert scale ranging from 0 (*Not at all*) to 4 (*Very much*), which requires participants to reflect on a recent activity. Lau and colleagues (2006) validated the TMS for use among general populations of adults and college students and found the measure able to detect changes in state-mindfulness following mindfulness-based treatment. A total score for the TMS is computed by adding the response values for all items. The TMS shows sub-scale scores in curiosity and decentering; researchers found both sub-scales to have an adequate coefficient alpha of .88 and .84 respectively (Lau, et. a. 2006). Higher scores on the total or individual sub-scales indicate higher levels of state-mindfulness. The TMS was

selected as a measure of state-mindfulness due to the reflective nature of the prompts and the factor loading into a decentering sub-scale. The mean score for the TMS for this study was $M = 31.79$ ($SD = 10.80$). The internal consistency for the TMS in this study was $\alpha = 0.92$; this value was excellent and suggested that the sample of pre-service teachers used for this study demonstrated consistency with the way they answered questions on this scale.

Perceived Stress. The Perceived Stress Scale (PSS; Cohen, Kamarck, and Mermelstein, 1983; see Appendix E) was used to measure the amount of stress participants had felt in the past month and their strategies for dealing with the stress. The PSS includes 10 statements, such as “In the last month, how often have you felt things were going your way,” rated on a 5-point Likert scale ranging from 0 (*Never*) to 4 (*Very Often*). The ten-item PSS has been validated with an English-speaking adult population to find adequate reliability ($\alpha = 0.84$; Taylor, 2015). The PSS was selected as a measure of stress perceived in the recent past. Although the scale asks participants to reflect on 30 days, participants may experience a change in perceived stress after a two-week intervention period and demonstrate differences in self-reported stress. This measure is still highly relevant despite the publication date and is often used within the literature. There are no other measures available that ask participants to reflect upon their own perceptions of stress levels. The measure therefore allows researchers to gain insight into participants’ perceptions of their own stress. The mean score for the PSS for this study was $M = 34.5$ ($SD = 3.30$). The internal consistency for the PSS in this study was $\alpha = 0.48$. This measure may have had lower internal consistency due to a relatively small sample size and the wide range of stressors that pre-service teachers face. Additionally, differences in what stressors individuals were thinking about throughout the 10 statements may have led to inconsistency with how responses were recorded.

Momentary Stress. A single item self-report of recent stress was created for use within the EMA-data collection period. In an effort to be quick and efficient in measuring the momentary stress experience, the question “Have you felt stressed since your last time answering or in the past 3 hours?” will be presented with a 4-point Likert response scale (*not at all, a little, a fair amount, a lot*). This single item is not a standardized measure of stress but was used to measure the momentary stress of participants throughout the study. The mean score for this item of the study was $M = 2.44$ ($SD = 1.13$).

Coping. The Brief COPE (Carver, 1997; see Appendix C) will be used to measure coping skills. The scale includes 10 statements, such as “I’ve been criticizing myself,” that are rated on a 4-point Likert scale ranging from 1 (*I haven’t been doing this at all*) to 4 (*I’ve been doing this a lot*). The Brief COPE was validated as a measure of coping among medical students and all subscale showed adequate internal consistency at $\alpha > 0.7$ (Yusoff, 2010). Scores from the Brief COPE will be used as a covariate to investigate the efficacy of mindfulness education on coping with stress. Individual styles of coping may influence participants’ engagement with mindfulness and reported level of stress. For example, individuals who score high on the items scaled for “acceptance” may show a greater tendency to use mindfulness when coping with stress. Alternatively, other items included in the “denial” sub-scale may be negatively associated with mindfulness engagement. Each subscale will be investigated to determine if there are significant relationships between coping style and mindfulness. One or more coping styles may be linked with higher or lower trait-mindfulness; additionally, coping styles may be linked with the likelihood of engaging in mindfulness practice. It was proposed to use this measure of coping as a covariate to inform results of this study based on the nature of mindfulness as both a trait and

practice. However, not all participants completed this measure by the start of the study, and it could not be analyzed in the way it was proposed for this sample.

Psychoeducation

A foundational component of this study was the psychoeducation covering the concepts of mindfulness and teacher-related stress. An undergraduate course on wellness for pre-service teachers within the Health Enhancement program was used to deliver the psychoeducation and to recruit for the EMA portion of the study. This semester-long course provided students with an overview of many health topics within the schools, such as mental health, stress management, and physical health of students. Although this was an optional elective course for students earning their teaching degree, many faculty members within the education department recommend that pre-service teachers enroll in the course. As such, there were 35 students enrolled in the course at the time of this study. Although psychoeducation was included as part of the course syllabus, participants were required to opt in to providing the data used for understanding the efficacy of psychoeducation in this study. At the start and finish of the psychoeducation, participants were asked to write down the definition of mindfulness to measure their understanding of the construct. Participants were also asked to provide written responses to open-ended questions about portions of the psychoeducation they felt were useful (see Appendix I).

The operational definition of mindfulness provided during psychoeducation contained three core components: directed attention, present moment, and non-judgment or curiosity. The similarity between participants' responses and this operational definition served as a measure of awareness of mindfulness. The psychoeducation lessons were based on *Mindfulness-Based Stress Reduction* (MBSR) and *Cultivating Awareness and Resilience in Education* (CARE). See

appendix F for a detailed outline citing which component of each curriculum was used. These approaches to teaching mindfulness were selected for their relevance to the practical skills of mindfulness and the focus of the application to the school setting. This study aims, in part, to investigate the efficacy and method of delivery for these curriculums on mindfulness. Previous research with psychoeducation for teachers has used sessions ranging from 30-minutes (e.g., Ling & Mak, 2012) to 480 minutes (e.g., Redfern, Jolley, Bracegirdle, Browning, & Plant, 2019). The optimal time for psychoeducation has yet to be found; however, the present study selected 100-minutes, in part, because it easily fit the schedule of the sample of pre-service teachers. A similar approach of bringing psychoeducation into the existing course schedule for pre-service teachers was used by Brown (2017).

The psychoeducation included foundations of mindfulness, mindful teaching, mindfulness in education, working with resistance, and a guided meditation. Participants were taught both formal and informal mindfulness practices to incorporate into their daily lives. During the psychoeducation, participants were provided the opportunity to ask questions about mindfulness and how to incorporate mindfulness into their daily lives. It was important to emphasize the utility of mindfulness to the individuals participating in the psychoeducation. There were also multiple examples of mindfulness demonstrated throughout each psychoeducation session, including guided meditations and real-world examples of informal mindfulness practices. During psychoeducation, participants were asked to report which elements of the psychoeducation they found most helpful. See Appendix F for a detailed outline of the psychoeducation curriculum and Appendix I for a list of all questions that participants were asked to provide written responses.

Ecological Momentary Assessment (EMA)

Ecological momentary assessment (EMA) was used to collect real-time data on the engagement with mindfulness-based stress reduction strategies and provide a reminder to utilize the strategies of mindfulness taught during psychoeducation for the treatment group. Participants were asked to use their personal devices for EMA data-collection. Participants were sent text-message notifications with instructions to answer a survey within 90 minutes of receiving the message. Notifications appeared in a pseudo-random fashion three times per day; this randomization was handled through an online platform called SurveySignal.com. This website allows researchers to select the options for frequency and timing of notifications to participants. The prompts were programmed to appear randomly within 4-hour blocks of time between 8 am and 10 pm. There was a one-hour “blackout” period in between prompts to ensure that enough time had elapsed between all signals.

The first question asked participants to enter their participant code number, that was used to link responses across multiple days/times. The principal investigator maintained a record of participants’ code numbers in case a participant forgot their unique code. Participants were notified during the consent process that they could contact the Principal Investigator if they forgot their code. This confidential information was secured within an encrypted file in a password protected folder on a locked computer.

For each EMA prompt, participants answered the following questions “Have you felt stressed since your last time answering or in the past 3 hours? (*Not at all, a little, a fair amount, yes, a lot*).” If they respond yes (any response other than “not at all”) to the first question, they will also be asked “Did you attempt to address your feelings of stress, if so, how?” Participants were provided with a list of possible coping strategies including mindfulness-based strategies

and an option to fill in their own strategy. Finally, all participants were asked to complete the Toronto Mindfulness Scale, a measure of state-mindfulness.

The treatment for this study was a reminder to practice a mindfulness technique of the participant's choice (e.g., 5-minute meditation, body scan). This reminder was administered at the start of each EMA signal. It was proposed that treatment (i.e., reminder to practice mindfulness) would occur for only one of the three prompts per day. However, to ensure that treatment occurred on a regular basis for the treatment group (regardless of response fidelity), the treatment occurred for every signal for participants assigned to the treatment group. So, for each signal, the treatment signal instructed participants to "*Find a time within the next 90 minutes to engage in a mindfulness practice. A few options for mindfulness include a timed meditation, a guided meditation, a full body scan, or a scan of your environment.*" Treatment fidelity for the mindfulness practice was assessed by asking participants "How would you rate your level of effort in practicing mindfulness? (0-25%, 26-50%, 51-75%, 76-100%)." It was important to understand fidelity of mindfulness practice, as this was a main focus of this study. The fidelity check served as a count for the number of times participants in the treatment group engaged in a mindfulness practice throughout the study, as well as an indication of mindfulness practice having occurred, so that analysis on subsequent reports of stress and state-mindfulness could be compared to the frequency of mindfulness practice. See Appendix G for a flowchart of EMA prompts including questions, measures, and group differences.

Procedure

Pre-service teachers in an education course on health and wellness within the schools were invited to participate in the current study. Two consent forms were provided. The first consent form (part 1) was for the data and feedback surrounding the psychoeducation session,

while the second consent form (part 2) was for the remainder of the study using EMA to promote and investigate mindfulness practices. Participants were told that the EMA portion of the study would last for two-weeks following the psychoeducation lesson, and that if they consent to continue, they would be assigned a code number to link their responses. They were informed that EMA would occur using text-message notifications that linked participants to an online survey available from Qualtrics.

Participants who consented to Part 1 were given a piece of paper to write their answers to the following questions: “What is your experience/familiarity with mindfulness? (e.g., heard of it, no experience, tried it a few times, practice routinely)” and “What do you think is the definition of mindfulness?” Participants wrote an anonymous code on the top of the page (e.g., name of first-grade teacher) that was used to match definitions pre- and post-psychoeducation. Participants were then presented with psychoeducation (see above section on Psychoeducation and Appendix F for details) on the concepts of mindfulness and specifically how mindfulness practices may be useful to cope with teaching-related stressors. Lesson materials were based on a workbook for *Mindfulness-Based Stress Reduction* (Stahl & Goldstein, 2010) and *Cultivating Awareness and Resilience in Education* (Jennings & Siegel, 2015). At the conclusion of psychoeducation, participants were given a piece of paper to write their answers to the following questions: “What do you think is the definition of mindfulness? What did you find helpful from the lectures on mindfulness? Do you think you would consider integrating mindfulness into your future classrooms? Why or why not?”

Participants who consented to Part 2 of the study were then asked to provide their email address and phone number to be used to distribute the baseline survey and register the participants for the survey designed on SurveySignal.com. Initial baseline data on trait-

mindfulness (Appendix B), coping style (Appendix C), and perceived level of stress (Appendix E) was collected along with demographic information (see Appendix A) using a Qualtrics survey sent out via email. The first signal sent to participants asked them to confirm their enrollment in the program and provided a shortened version of the consent form they had already signed; this gave participants one more chance to remove themselves from the EMA signals. The EMA portion of the study ran for fourteen days, and sent three signals to participants each day, for a total of 42 signals. See above section and Appendix G for details about the content of EMA signals across treatment and control. It was proposed to contact participants post-EMA to collect data on trait-mindfulness, coping style, and perceived stress; however, the consent form failed to include this as part of the study and therefore participants could not be contacted for follow-up.

Chapter IV: Results

Part 1: Psychoeducation

Data was collected during the time of the psychoeducation to assess the utility and effectiveness. Participants were given a sheet of paper at the start and conclusion of the psychoeducation (see Appendix I) and instructed to write responses to questions about perceptions and experiences with mindfulness. Definitions were transcribed from these papers to an SPSS file to be coded for components of the operational definition of mindfulness.

The coding guide (Appendix H) was created for coding of mindfulness definitions across independent raters; this guide was used by Rater 1 (the author of this study) and Rater 3 (an undergraduate research assistant). The coding guide was based on literature which has aimed to operationalize the definition of mindfulness (e.g., Bishop, et al., 2004) and included key components of 1) intentional awareness, 2) present-moment awareness, and 3) non-judgment or curiosity. Synonyms were provided that were consistent with each of these three components that allowed participants to write similar descriptions without the exact words listed above. Again, the use of synonyms is reflected in literature about defining mindfulness (Bishop, et al., 2004). Synonyms were determined after the author of this study had viewed the definitions written by participants. Inter-rater reliability was found to be Kappa = 0.45. This relatively low value was determined to arise from a difference in scoring eight individual items (six of which were pre-scores). This may be indicative of a great variation in participants definitions prior to psychoeducation compared to more consistency and accuracy seen post-psychoeducation. To address this discrepancy in scoring, Raters 1 and 3 collaborated to recode only those items which were initially scored differently. This resulted in a final rating score used to perform analysis for this research question in which Rater 1 and Rater 3 were in complete agreement on coding.

Research Question 1: To address research question 1 (Does 100-minutes of psychoeducation on mindfulness increase awareness and understanding of mindfulness?), researchers examined the definitions of mindfulness written before and after the psychoeducation by participants. It was hypothesized that participants would write significantly more accurate descriptions of mindfulness post-psychoeducation compared to pre-psychoeducation. The operational definition of mindfulness contained three basic components (i.e., purposeful awareness, present moment, non-judgement). All definitions were quantified and coded a score ranging from 0-3, indicating the number of components from the operational definition of mindfulness that were present. See Appendix H for coding guide.

The number definition components for mindfulness at pre-psychoeducation had a mean of 0.54 (SD = 0.67). The data for pre-psychoeducation had a positively skewed distribution (*Figure 1*). The number definition components for mindfulness at post-psychoeducation had a mean of 1.35 (SD = 0.90). The data for post-psychoeducation had a normal distribution (*Figure 1*). The difference in the number of components for mindfulness between pre- and post-psychoeducation had a mean of 0.5 (SD = 0.89). The data for the difference in definitions had a positively skewed distribution (*Figure 2*).

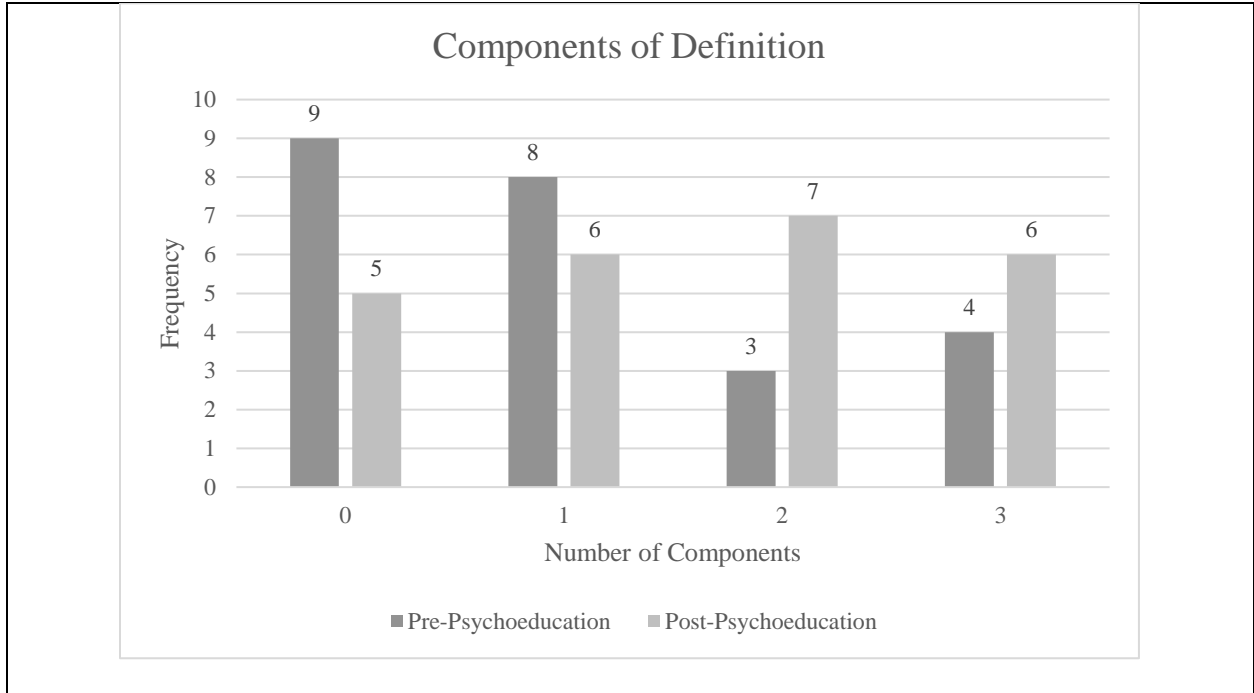


Figure 1. Histogram of Components of Definitions

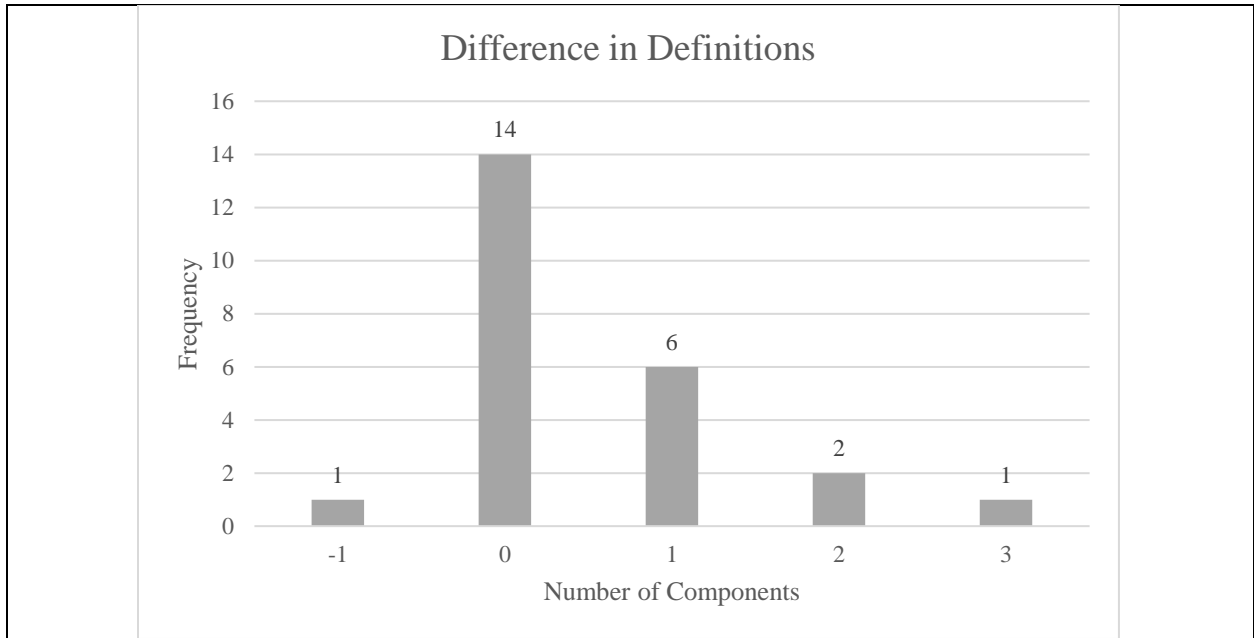


Figure 2. Histogram of Difference in Definitions

The data used for analysis of this research question was the difference in scores between pre- and post-psychoeducation; however, this data was positively skewed and did not meet the assumption of normality (see Figure 2 above). Thus, a nonparetric Wilcoxon Signed Ranks test was used to compare the mean ranks of the paired data (i.e., pre- & post-psychoeducation). The results indicate that post-psychoeducation definitions show an increase in the number of components of mindfulness compared to pre-psychoeducation ($Z = -3.31, p < 0.001, r = 0.67$). According to Cohen's standard, this is considered a moderate effect size. A moderate effect size suggests that the treatment (i.e., 100-minutes of psychoeducation) had a noticeable effect size on participants' understanding of the definition of mindfulness.

Part 2: EMA

Data for treatment and control was downloaded from Qualtrics and analyzed using IBM SPSS Statistics 24. Each data file was cleaned to show the external reference number (participant ID) along with relevant data. The data for the EMA portion of the study included the number of responses from each participant, ranging from 3 – 30 responses: $M = 13, SD = 11.09$. The standard deviation is relatively large compared to the mean, in part due to the large range of response rates from various participants. To understand the relatively large standard deviation for the rate of response, a closer look was taken for each participant. The response rate determined by SurveySignal calculates the percentage of signals that participants responded to by clicking the link to the Qualtrics survey. Participants had the following responses rates: 88.1%, 71.43%, 66.67%, 19.05%, 11.9%, and 11.9% of signals.

Research Question 2: To address research question 2 (Does a daily reminder to practice mindfulness change mindfulness practices among pre-service teachers?), it was proposed to conduct an analysis of covariance to determine if a daily reminder to practice mindfulness

changed mindfulness practices among the sample. It was hypothesized that a daily reminder to practice mindfulness (i.e., treatment) would significantly increase the frequency of mindfulness practice. However, after participants were randomized into treatment and control groups, immediate differences in retention were seen. On the first day of the EMA portion of the study, 1 out of 8 participants assigned to the control group continued participation compared to 5 out of 8 participants assigned to the treatment group. Since this difference was seen immediately on Day 1 of treatment, it is assumed that this was random and not due to differences in protocol between treatment and control groups. Consequently, it was not appropriate to conduct an analysis of covariance due to the large discrepancy between the number of participants in treatment and control groups.

The frequency of mindfulness engagement was calculated based on whether participants reported mindfulness as a recent stress-relief strategy or if their response on the treatment fidelity check showed efforts of 50% or greater with the recent mindfulness exercise. Treatment group ($n = 5$) reported recently practicing mindfulness at the following rates: Participant 1: $5/5 = 100\%$, Participant 2: $5/5 = 100\%$, Participant 3: $3/3 = 100\%$, Participant 4: $7/8 = 87.5\%$, and Participant 5: $18/26 = 69.2\%$ of responses. On the other hand, the control group ($n = 1$) reported practicing mindfulness at the following rates: Participant 1: $3/29 = 10.3\%$ of responses.

Data Management and Assumptions Check: For Research Questions 3 and 4, analysis was conducted across six consecutive responses to the EMA prompts. Only three participants responded to enough prompts to analyze their data as proposed (i.e., they had more than six responses); two participants from the treatment group and one from the control group. Two new variables were created for the mean level of stress and frequency of mindfulness practice within six consecutive responses.

Since both Research Questions 3 and 4 proposed to use a Pearson correlation, the specific assumptions of this test were investigated due to the small sample size. First, to test the assumption of normal distribution, the Normal Predicted Probability plot was created and found to generally follow a diagonal line from the bottom left-side of the plot to the top right-side of the plot. This suggested that the residuals from this data set were normally distributed. Next, a test of homoscedasticity was conducted using a scatterplot of the regression residuals and predicted values. The scatterplot was visually analyzed and showed data spread out around in an upside-down u-shape. Since data were generally spread out across the plot, it was determined that the dataset met the assumption of homoscedasticity.

Research Question 3: To address research question 3 (Does engagement with mindfulness differentially affect stress levels among pre-service teachers?), a correlation between the mean level of momentary stress and frequency of mindfulness practice was calculated for each of the six consecutive responses. It was hypothesized that higher frequency of mindfulness practice (i.e., report greater than 50% engagement to the fidelity check or select a mindfulness technique as a stress-relief strategy within six consecutive responses) would be significantly negatively associated with mean levels of stress on a self-report measure of momentary stress. Results of the Pearson correlation indicated that there was a significant *positive* association between the mean level of stress and frequency of mindfulness practice, $r(49) = 0.60, p < 0.01$.

Research Question 4: To address research question 4 (Does engagement of mindfulness differentially affect reported levels of state-mindfulness among pre-service teachers?), a Pearson correlation was conducted between the mean level of state-mindfulness (as measured by the TMS) and frequency of mindfulness practice (as measured by the participants' reporting use of

mindfulness and the treatment fidelity check if participants reported 50% or higher level of engagement in recent mindfulness activity) averaged across six consecutive responses. It was hypothesized that engagement of mindfulness would significantly positively correlate to state-mindfulness. Results of the Pearson correlation indicated that there was a significant positive association between the mean level of state-mindfulness and the frequency of mindfulness practice, $r(49) = 0.73, p < 0.01$.

Chapter V: Discussion

The classroom dynamic is influenced by myriad factors such as discipline procedures, demographics of students and teacher, and day-to-day routines. Pre-service teachers face similar stressors as novice teachers, and explicit curriculum surrounding topics of social-emotional skills can be included in their training. The current study proposed to add to the current understanding of stress reduction and stress management in the school system by using psychoeducation and ecological momentary assessment as an intervention to introduce mindfulness to a sample of pre-service teachers. The current study looked at how effective a relatively small dose of psychoeducation was at increasing awareness of mindfulness. The study utilized ecological-momentary assessment (EMA) to remind participants about the cultivation of mindfulness as a practice and assess state-based levels of stress and mindfulness. The EMA was part of the treatment for participants to frequently engage with mindfulness after receiving psychoeducation on mindfulness-based stress reduction and applications of mindfulness within the classroom.

Research Question 1:

The first research question for the present study was “Does a 100-minute psychoeducation session on mindfulness increase awareness and understanding of mindfulness?” Researchers hypothesized that after a 100-minute psychoeducation session, participants would write significantly more accurate descriptions of mindfulness, including at least one more component of the operational definition compared to definitions written prior to psychoeducation. This question was investigated using definitions written by participants pre- and post-psychoeducation. The difference was found to be statistically significant, suggesting that on average, participants increased their understanding of the definition of mindfulness.

Although, it is difficult to pin down an exact definition of mindfulness, participants appeared to gain understanding of the definition being presented in psychoeducation after 100-minutes of education and training on mindfulness. There was a significant increase in the number of definition components participants were able to generate post-psychoeducation compared to pre-psychoeducation. Furthermore, the effect size was moderate for this difference in definitions, suggesting that the difference in learning was not trivial. Implications include that a relatively small amount of psychoeducation that is targeted on mindfulness concepts can help individuals understand the definition of mindfulness.

Examination of Figures 1 and 2 reveal some qualitative results relevant to Research Question 1. The frequency of definitions containing zero components of the operational definition of mindfulness decreased from nine to five at post-psychoeducation. Additionally, the frequency of definitions that contained two or more components of the operational definition of mindfulness increased from seven to thirteen at post-psychoeducation. Overall, this supports the idea that brief psychoeducation can increase awareness and understanding of what is mindfulness.

However, there is also evidence to suggest that this sample of pre-service teachers may have had a difficult time changing what mindfulness meant outside of their routine use of the word. For example, one participant had a definition at pre-psychoeducation with 0 components of the operationalized definition shared during psychoeducation. At post-psychoeducation, this participant simply wrote “same as before” for the definition of mindfulness. Similarly, one participant wrote a definition pre-psychoeducation that focused on “how we deal with...problems” and after psychoeducation maintained a similar definition to say that “mindfulness is being aware of your emotions and how you deal with those emotions.” This

rigidity and consistency of definitions lacking key components of what is mindfulness may demonstrate an inflexibility to changing one's thoughts surrounding the topic of mindfulness. Alternatively, contextual factors involved for busy student teachers may play a role in demonstrated learning outcomes. For example, when conducting a semester long research study of mindfulness for student teachers, Brown (2017) suggested changes to the curriculum to match individual needs across personally relevant contexts. Psychoeducation could have focused more on participant-generated definitions as direct points of comparison and correction for increased learning outcomes. Figure 3 shows that 14 out of 24 participants saw no difference for the definitions pre- and post-psychoeducation, compared to 9 out of 10 participants making positive progress in the number of definition components they recalled. This supports the suggestion that the sample of pre-service teachers may have had difficulty adjusting their thoughts on what mindfulness means.

Overall, there was evidence to support that a 100-minutes of psychoeducation may increase awareness of what is mindfulness for pre-service teachers, as seen in the increase of accurately written definitions of mindfulness. The definition of mindfulness is a starting point for one's future practice to be built and improved upon. Previous research and intervention programs often start with definitions of the term and foundations for building a solid practice (e.g., Jennings & Siegel, 2015, *Cultivating Awareness and Resiliency in Education, CARE*). The *CARE* program has a detailed first chapter that defines mindfulness as a practice aimed at increasing awareness of the present moment without judgement. It seems that the first step to any mindfulness-based psychoeducation or intervention must be a solid understanding of the definition of the term to ensure that the subsequent skills and practice are built correctly. Only once this definition is concrete can it be applied to the multitude of activities and exercises

incorporated into this and other programs. This is emphasized by Stahl and Goldstein (2010) in their workbook on *Mindfulness-Based Stress Reduction* (MBSR). These authors suggest that first, a definition of mindfulness must be thoroughly understood to build a deep and meaningful practice. Although the ability to define mindfulness is not a direct measure of understanding of mindfulness, it is related and may serve as a snapshot of the thoughts that an individual has during a mindfulness-based exercise about the purpose and goal of the practice. Unfortunately, understanding of mindfulness as a concept is not studied within the current literature on the topic. Instead, researchers often use previous experience with mindfulness as a way to measure exposure and familiarity with the concept. For example, Bravo, Pearson, Wilson, and Witkiewitz (2018) found that previous experience with meditation was associated with state-mindfulness, as well as a larger increase in trait-mindfulness following a brief body scan meditation, compared to individuals without experience in meditation. This suggests that experience and prior knowledge of mindfulness may increase the efficacy practices such as a mindful body scan meditation. However, authors did not investigate why previous experience leads to these effects and whether there was a difference in the level of understanding that participants brought to the experimental mindfulness-induction. For this reason, a foundation understanding of mindfulness should be included in mindfulness-based interventions, treatment programs, and research.

Research Question 2:

The second research question for the present study was “Does a daily reminder to practice mindfulness change mindfulness practices among pre-service teachers?” Researchers hypothesized that participants who receive a reminder to practice mindfulness would show a significantly higher mean-frequency of practicing mindfulness in a given period of six consecutive responses compared to a control group during the same period, as measured by self-

reported stress relief strategies and fidelity check for the treatment group. However, due to issues of retention, the participants who completed the study were not evenly distributed across the treatment and control groups; thus, inferences about this research question could not be made from the data in the present study. The likelihood of practicing mindfulness was not analyzed in relation to group assignment due to lack of adequate power.

It is notable that data collected for this study included the frequency of reported mindfulness practice for participants. There were some participants who reported having practiced mindfulness each time they engaged with data collection. It is possible that participants knew the nature of the study and only reported data after making time to practice mindfulness. However, when comparing two participants with similar total number of data collection points (one from each treatment and control group), a prominent difference is seen. Participant 5 in the treatment reported practicing mindfulness 69.2 % (18 out of 26) of responses, compared to Participant 1 in the control group, who reported practicing mindfulness 10.3% (3 out of 29) of responses.

Although many researchers suggest that the practice of mindfulness is critical to the cultivation of positive outcomes (e.g., Snippe, Dziak, Lanza, Nyklíček, & Wichers, 2017), relatively few research studies have focused on methods to initiate mindfulness practice. The results of the present study suggest that after brief psychoeducation (i.e., 100-minutes), individuals willing to engage in mindfulness have some of the skills necessary to begin a routine practice. By volunteering to participate in a research study on mindfulness, participants may be reinforced to think about mindfulness each time they are asked to provide data. The treatment of the present study was to make this reminder explicit and instruct participants in the experimental group to practice mindfulness. Previous research has highlighted group differences between

novice and experienced meditators (e.g., Bravo, Pearson, Wilson, & Witkiewitz, 2018), but no research has examined how this experience is built and how to support a continued practice of mindfulness over time. With the influx of smartphone applications that can be programmed to remind individuals about habits, such as mindfulness, research can focus on the efficacy of technological integrations to enhance the application of mindfulness-based interventions.

Research Question 3:

The third research question for the present study was “Does engagement with mindfulness differentially affect stress levels among pre-service teachers?” Researchers hypothesized that higher frequency of mindfulness practice, as measured by whether participants report *yes* to the fidelity check or select mindfulness as a stress-relief strategy, would be significantly negatively associated with mean levels of stress on a self-report measure of momentary stress on average for a given period of six consecutive responses. The results of this study suggested that there was a significant positive relationship between frequency of mindfulness engagement and momentary stress levels. Although these results are not in the direction originally hypothesized, they should be considered within the context of practice for the participants of this study. In their research on the differences between state and trait mindfulness, Egan, Hill, and Foti (2017) revealed that state mindfulness (i.e., task-induced) increased attention to stimuli regardless of the affect associated with the stimuli. It is possible that by practicing mindfulness, participants were more aware of their stress levels in the moment. Additionally, it is possible that the sample of pre-service teachers for this study experienced stress throughout data collection but were simultaneously open to practicing mindfulness. Implications of the results of this study suggest that pre-service teachers may be open and willing to engage with stress-management techniques that are taught during their routine curriculum. Alternatively,

psychoeducation in this study presented mindfulness as a potential stress-management technique; participants may have recognized their high stress level and sought out mindfulness practice to alleviate the feelings of stress. This can be seen in previous literature, which has found a difference between the effects of mindfulness practice on positive and negative affect. Blanke, Riediger, and Brose (2018) found that higher frequency of positive affect was associated with attention to the present moment, whereas lower frequency of negative affect was related to nonjudgement. These researchers also found that the nonjudgmental component of mindfulness acted as a buffer to the daily hassles that affected well-being. If participants are more quickly adopting the present moment awareness without including nonjudgement into their practice of mindfulness, there may be a heightened sense of awareness that leads to an increased negative effect of stress in daily life.

Researchers also hypothesized that higher frequency of mindfulness practice, as measured by whether participants report *yes* to the fidelity check or select mindfulness as a stress-relief strategy, would be significantly negatively associated with mean levels of stress on the Perceived Stress Scale at post-test. Previous research has found that mindfulness-based interventions can combat stress and anxiety among teachers (e.g., Beshai, McAlpine, Weare, & Kuyken, 2016). However, due to limitations in consent for the present study, researchers were unable to collect the post-test data to inform this research question.

Research Question 4:

The fourth research question was “Does engagement of mindfulness differentially affect reported levels of state-mindfulness among pre-service teachers?” Researchers hypothesized that higher frequency of mindfulness practices, as measured by whether participants reported *yes* to the fidelity check or selected mindfulness as a stress-relief strategy, would be significantly

positively associated with mean levels of self-reported state-mindfulness as measured by the Toronto Mindfulness Scale. Results confirmed this hypothesis, suggesting there was a significant positive relationship between frequency of mindfulness engagement and state-mindfulness.

Although the mindfulness engagement used in this study was unstructured and flexibility was given to the participant to choose the modality, these results replicate previous findings that brief engagement with mindfulness can increase state mindfulness (e.g., Luberto & McLeish, 2018; Mahmood, Hopthrow, & de Moura, 2016). During psychoeducation, participants of this study were provided multiple examples of mindfulness practices, which they may have utilized during the EMA data collection period. It is interesting to note that although psychoeducation was relatively brief, and mindfulness practice modality unstructured, the results still replicate previous studies that used prescribed mindfulness practices (i.e., 10-minute guided mindfulness and computer-mediated mindfulness practice used by Luberto & McLeigh and Mahmood & colleagues, respectively). Mindfulness practice can be individually tailored to suit the needs of time, space, and personal preference. When Blanke, Riediger, and Bros (2018) investigated the state-based differences in affect following mindfulness practice, they found the immediate benefits of mindfulness practice to be associated with higher state mindfulness, positive affect, and lower negative affect. When the foundations of mindfulness are understood with accuracy, myriad forms of practice may prove to have high fidelity.

Limitations and Future Research Directions

There are limitations with every research study, which researchers uncover throughout the process of data collection and analysis. A considerable limitation to the present study was the recruitment and retention of participants. Retention is often an issue with human-subjects research, and it is difficult to speculate the reason for issues of retention in the present study.

Additionally, utilizing EMA may have created barriers for retention due to the number of times participants are asked to engage with the research study. For example, Moitra, Gaudiano, Davis, and Ben-Zeev (2017) completed an EMA study where participants completed only 28 to 31% of possible data collection periods. For the present study, there were significant issues of retention such that the number of participants in each group who completed the study was inconsistent (i.e., $n = 5$ for treatment, $n = 1$ for control). As such, group differences are not reported for this current study. In this line of research, it is important to consider that pre-service teachers may have significant stress and high work-loads that limit their willingness to participate in research. For example, students in the program of study recruited for this study are expected to take a full course-load (i.e., 12+ credits per semester), some of which include on-site practicum experiences in local schools as student-teachers. The students gain generalist skills in teaching prior to selecting a “block” to focus on, such as elementary education or secondary history education. It is also common for many college students to have additional part-time jobs while in school. Participating in research may not be appealing to individuals who already feel overworked or committed to their current workload. This study framed participation as an opportunity to advance the field of research that supports student, novice, and veteran teachers. Future studies should consider possible incentives for participation in addition to the potential for great scientific knowledge, such as a raffle for a gift card or other monetary reward. A material incentive may be more motivating for an individual to participate and gain personal resources, rather than assuming that individuals will be motivated by contributing to resources aimed to improve the well-being of a broader group of people.

A second limitation to this study was the significant difficulty of rating the mindfulness definitions written by participants pre- and post-psychoeducation. Two raters were trained by the

author of this paper to read through the definitions and code a value (0-3) for the number of components present in the definition. However, the initial guide for coding was created prior to exposure to the definitions written by participants and failed to capture the diversity of synonyms and phrases that could be considered to depict one's understanding of the concept. Thus, a second (and final) guide for coding had to be created. Although the ratings from the round of coding using the final guide also produced a relatively low Kappa value, the trend for differences in scoring here differed from the first round of coding. The final coding guide produced more similarities with post-psychoeducation definitions than pre-psychoeducation definitions. In other words, the differences between coders in the final coding were found mostly for definitions written prior to psychoeducation. It is possible that the variation in definitions seen prior to psychoeducation was influenced by participants' lack of understanding about the concept.

Future research may benefit from only using raters and coders who are deeply familiar with the literature surrounding mindfulness. A list of synonyms fails to capture the nuanced iterations of a quality definition. For example, a novice rater may fail to understand how "open and thoughtful" is the same as "open-minded" or how "aware of your current state" is the same as "in the present moment." The difficulty in coding the definitions for the first research question poses a significant limitation to this study. The last round of coding resulted in a relatively low inter-rater reliability (i.e., Kappa = 0.45); however, the eight items coded differently between raters were discussed and a final code given based on careful consideration of the coding guide (Appendix H). Even with a detailed reference guide for coding, the experience level of the two coders were vastly different. This could contribute to the relatively low reliability between raters. Similar to the findings of this study, which suggest that understanding of mindfulness is slow to change (i.e., definitions of 14 out of 24 participants showed no change), it may be difficult for a

novice research assistant to comprehend the details of how to define mindfulness. Training an undergraduate research assistant for a research task to code 24 items is not equivalent to multiple years of research and saturation with current literature on the topic. In the future, careful training and guidance for research assistants must be considered when using non-experts to code data.

A third limitation to this study was the inability to covary past experience with mindfulness and natural coping style of participants with other participant data collected. Because not all the participants completed these measures prior to being sorted into treatment and control groups, it was not possible to ensure a relatively equal spread of experience across groups along these two variables. This may be one of the reasons why there was inconsistency with retention across groups. It is possible that those who had experience with mindfulness were more motivated to complete participation through the EMA portion of the study. Additionally, if one's natural coping style includes acceptance, there may be a greater sense of ease with exploring mindfulness-based practices. This relates to research conducted by Bravo, Pearson, Wilson, and Witkiewitz (2017) investigating self-reports of state- and trait-mindfulness and response to a mindfulness-based intervention (i.e., body scan). Bravo and colleagues found that participants with past experience in meditation and those with higher scores in the observation facet of mindfulness showed the highest levels of state mindfulness of body and mind. This suggests that past experience and an ability to observe one's internal and external environment may enhance mindfulness-based activities. This research suggests that mindfulness operates as both a state and trait level experience. Without consideration for past experience of mindfulness and dispositional mindfulness, it is difficult to conclude how results are impacted by the intervention of psychoeducation and daily reminder to practice compared to these confounding variables.

A fourth limitation to this study was the length and utility of psychoeducation for pre-service teachers. Mindfulness-based interventions can prescribe upwards of 480 minutes of psychoeducation for teachers (Redfern, Jolley, Bracegirdle, Browning, & Plant, 2019); however, feasibility must be considered when designing a research study. Other researchers have considered time commitment as a potential barrier to participants, using only 30-minutes of psychoeducation with teachers (Ling, & Mak, 2012). Ultimately, for this study the researchers collaborated with the course instructor for the most feasible amount of time to devote to psychoeducation for the pre-service teachers. Based on previous literature and convenience for participants, psychoeducation was tailored to fit their existing course schedule. It was not feasible to offer longer than 100-minutes of psychoeducation due to the limitations of course scheduling for the sample of pre-service teachers. Additionally, data was collected and analyzed to investigate the efficacy of the psychoeducation; however, there are myriad additional ways for this to be evaluated. The first research question for this study asked if 100-minutes of psychoeducation was adequate for participants to write significantly more accurate definitions of mindfulness. However, this measure does not identify how effective the participants are in actually practicing mindfulness. It is possible that individuals can write accurate descriptions of mindfulness, but unable to put that knowledge into practice. Similarly, an individual may have a practice with accurate adherence to the nature of mindfulness but be unable to verbalize the definition of mindfulness when prompted. Further, skills-based measurements must be created to evaluate the efficacy of mindfulness training for the utility of increasing the ability for participants to engage in mindfulness.

Future research on mindfulness for pre-service teachers may benefit from targeting the strategies that aid in the initiation of a mindfulness practice. Additionally, psychoeducation about

how pre-service teachers may be able to teach mindfulness to students may have a broader appeal to this population. The present study was aimed at building a mindfulness practice for pre-service teachers, but could be expanded to include practice for young people and students in the schools. The present study found that some of the participants may have adopted mindfulness as a practice; however, the data collected did not indicate the likelihood of practice, type of practice, nor duration of practice. Investigations into the style and likelihood of practice would inform interventions aimed at promoting mindfulness for pre-service and veteran teachers. Studies with adequate power may be able to make direct comparisons between a treatment, such as a daily reminder to engage in mindfulness, to determine the efficacy of this treatment for building a mindfulness practice as an intervention tool.

Future EMA studies on mindfulness training may also contribute to the research body by including data collection expanded beyond the 14-day timeline that was used in the present study. It is possible that given more practice with mindfulness, a different relationship between engagement and stress levels would be seen. Additionally, this longer-term study could investigate factors that contribute to establishing a routine practice. It is well known that benefits of a routine mindfulness practice can change over time as various stressors and environmental factors collide with an individual's coping style and ability to manage difficult emotions. An EMA study aimed at investigating various stressors in relation to the likelihood of practicing mindfulness may elicit important information for how to structure initial and follow-up psychoeducation for pre-service, novice, and veteran teachers. It is possible that pre-service teachers may respond differently to mindfulness-based interventions depending on the stressors present in their daily lives.

There are also myriad possible methods of utilizing EMA. For example, methods that provide participants with a separate device may provide a more unique signal for which to respond. It is possible that participants received many notifications throughout the day and that the signal sent for the present study was missed amongst the “noise” of these other notifications. Separate devices or programs that disrupt the type of signal (e.g., specific noise and volume) may provide a more recognizable signal for participants. When researchers program their own software, they can make sure that multiple reminders are included to address this issue of participants potentially missing the signal to provide data. With the methodology of the present study, it is not possible to determine how many signals participants intentionally did not respond to or accidentally dismissed amongst other notifications that arrived on their personal device.

In future studies, it would be advisable to allot time to specifically train participants on use of the EMA technology. Although it may seem intuitive to researchers and include explicit written instructions, participant training would ensure preparedness for participation in the study. Going step by step through the process would allow participants to understand the process and acknowledge what is expected for the completion of the study. Additionally, to address the question of buy-in to the study, researchers can check-in with participants prior to and post psychoeducation to give more information and answer questions about the methodology of the study.

Methodological changes could improve future studies on building mindfulness practices for pre-service teachers. As mentioned before, EMA technology which directly controls the volume and reminders of signals may provide more consistent responses from participants. It is possible for researchers to provide devices for use within the study and lock settings of the device to ensure that signals are heard by participants. Additionally, researchers can program

different signaling programs which similarly effect volume and notification settings in such a way to increase the likelihood of participants noticing and responding to signals. Furthermore, visiting a classroom of pre-service teachers may be improved by establishing a more impactful relationship with the class. This may be accomplished by quick visits prior to psychoeducation to introduce the topic, the study, and the researcher. Similarly, a second visit post-psychoeducation or post-EMA may be used as a follow-up to the education lesson and study participation.

Researchers may find that participants encountered specific difficulties or success stories that would be beneficial to discuss in the classroom-based setting. All pre-service teachers in the class may benefit from discussion of participation in the study and how their colleagues began to establish mindfulness practices. Changing the method protocol of the current study to include variations on the EMA technology and additional data collected post-EMA would benefit future research.

Finally, the long-term effects of mindfulness-based psychoeducation and interventions for pre-service teachers could have lasting benefits to the education system. It may be helpful for future research with longitudinal designs to investigate the effects of mindfulness psychoeducation for pre-service teachers in relation to long-term outcomes of teacher efficacy, student success, and school climate (both globally for a school or district and at the individual classroom-level). The benefits of teaching pre-service teachers about mindfulness have yet to be studied long-term in relation to these variables. However, evidence-based instruction of public-school teachers is likely to have a positive influence on the education system.

Implications for Practice

The amount of exposure to mindfulness training necessary for deep understanding of the concept has yet to be established. The present study downsized the amount of training used in

manualized programs such as *Mindfulness-Based Stress Reduction* (i.e., 25 hours of training) to two brief, 50-minute sessions of psychoeducation (100-minutes total). There was a moderate increase in understanding of mindfulness during this time, as defined by the participants' ability to define mindfulness. This suggests that even brief psychoeducation on mindfulness can change perspectives regarding what it means and how it can be applied as a coping skill. Practitioners who seek to educate the public on mindfulness should be wary of how individuals use the term in their routine lives and may need to shape a new operational definition for therapeutic use. For example, individuals may expect that mindfulness practice will immediately reduce their feelings of stress, rather than correctly recognizing that over a long-period of time, routine practice can bring about some of these changes. Practitioners should include explicit re-teaching of this concept to avoid confusion about the colloquial use of 'mindfulness' or 'mindful' outside of an intervention setting. Practitioners may choose to dedicate a portion of psychoeducation to responding to participants' pre-conceived notions of mindfulness and explicitly denoting the similarities and differences between the definitions provided from individual experience and the meaning of the terms used in psychoeducation. This explicit re-teaching could provide a better understanding and engagement with mindfulness.

Equipping individuals with hand-on experience of practicing mindfulness can be beneficial to aid in generalization of the skills to their daily lives. The psychoeducation used in this study included multiple guided meditations as well as suggestions for informal mindfulness practices. It may be useful for participants to help generate ideas for informal practice and ways that they would personally incorporate mindfulness into their routine. By engaging individuals with this type of structured practice and reflection, integration into their daily lives may be more feasible after psychoeducation is complete. The goal of this type of psychoeducation is to inspire

individuals to make changes in their lives to include mindfulness as a routine practice. However, the data in this study is pilot data that should not be generalized outside the sample used. The sample in the present study was relatively small and limited in the scope of diversity in terms of age, experience, gender, and racial identity of pre-service teachers. It may provide a rationale for additional research, but does not indicate the likelihood of a similar method with other samples of pre-service teachers. Future research may use a similar protocol to equip pre-service teachers with coping skills aimed at stress-management and control of first-year burnout within the field.

The use of a daily reminder to practice mindfulness was an important intervention in this study. Although direct group comparisons were unable to be made due to inequality of group retention, participants who received this daily reminder appeared to use it as a motivation to practice mindfulness. There are a multitude of smartphone applications or basic timers that could be utilized as a therapeutic intervention to remind individuals to engage in mindfulness routinely. For individuals, groups, or entire systems where mindfulness is being presented as an intervention to increase positive social-emotional competencies or desired outcomes, a daily reminder may serve to increase how frequently individuals attempt to practice mindfulness.

Gaining an accurate understanding of mindfulness provides the foundation to start a practice of engaging with mindfulness routinely. Once individuals understand the concept, they must learn how to incorporate mindful attention into their daily life. This integration will likely look vastly different for any one person, even if they work in the same setting. Using a reminder on one's smartphone may be a useful first step to building this practice, serving as an external reminder for this internal process. Over time, it is possible that the external cues can be reduced or eliminated once a mindfulness practice has been established. Individuals can work with practitioners to determine the best time and type of reminder for their use. Ultimately, to aid in

feelings of acceptance and nonjudgement, it is advisable to make mindfulness an approachable and integrative practice. Allowing individuals to tailor the type of mindfulness practice to suit their personal lives may allow the practice to fit more easily within the busy lives of teachers and other professionals. Continued research and practical exploration on building the practice of mindfulness can help mindfulness-based intentions be more feasible and approachable for teachers and other populations.

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Appendix A**Demographic Information Collected**

Age

Gender (Female, Male, Non-Binary, Other)

Race (White, Black, Latinx, Asian, Native, Other)

Experience with Mindfulness (Never heard of it nor practiced, Heard of it but never practiced, Heard of it and practiced a little, Heard of it and practiced, Heard of it and extensive practice)

Appendix B

MAAS Scoring

To score the scale, simply compute a mean (average) of the 15 items. Higher scores reflect higher levels of dispositional mindfulness.

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6

Appendix C

Brief COPE

These items deal with ways you've been coping with the stress in your life. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

- 1 = I haven't been doing this at all
- 2 = I've been doing this a little bit
- 3 = I've been doing this a medium amount
- 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.

25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

Appendix D

Toronto Mindfulness Scale

Toronto Mindfulness Scale

<p>Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?</p>	Not at all	A little	Moderately	Quite a bit	Very much
1. I experienced myself as separate from my changing thoughts and feelings.	0	1	2	3	4
2. I was more concerned with being open to my experiences than controlling or changing them.	0	1	2	3	4
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations.	0	1	2	3	4
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are.	0	1	2	3	4
5. I was curious to see what my mind was up to from moment to moment.	0	1	2	3	4
6. I was curious about each of the thoughts and feelings that I was having.	0	1	2	3	4
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.	0	1	2	3	4
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.	0	1	2	3	4
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.	0	1	2	3	4
10. I remained curious about the nature of each experience as it arose.	0	1	2	3	4
11. I was aware of my thoughts and feelings without overidentifying with them.	0	1	2	3	4
12. I was curious about my reactions to things.	0	1	2	3	4
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.	0	1	2	3	4

Scoring:

Key: All items were written in the positively keyed direction, so no reverse scoring of items is required.

Curiosity score: The following items are summed: 3, 5, 6, 10, 12, 13

Decentering score: The following items are summed: 1, 2, 4, 7, 8, 9, 11

Appendix E

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (*Circle*): **M F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

- | | | | | | |
|--|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly? | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life? | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"? | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems? | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way? | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do? | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life? | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things? | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control? | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |

Appendix F

Psychoeducation Detailed Outline

- I. Defining Mindfulness for Educators & Students
 - a. Definition of Mindfulness as present moment attention without judgment
 - i. Three components: directed attention, present moment, non-judgment or curiosity (Stahl & Goldstien, 2010).
 - ii. Defining mindfulness for educators (Jennings & Siegel, 2015)
 - b. The Emotional Art of Teaching (Jennings & Siegel, 2015)
 - i. The Role of the Teacher in Regulating Children (Jennings & Siegel, 2015)
 - ii. How emotions are transmitted in the classroom (Jennings & Siegel, 2015)
 - iii. Reactivity example (Jennings & Siegel, 2015)
 - c. Mindfulness and the mind-body connection (Stahl & Goldstien, 2010)
 - d. Lesson Demo: Guided breathing meditation
- II. Mindfulness in Education
 - a. Wheel of Emotion (Jennings, 2015; Stahl & Goldstien, 2010)
 - b. Lesson Demo: Emotions Journal (Jennings & Siegel, 2015)
 - c. Mindfulness is Daily Living (Stahl & Goldstien, 2010)
 - i. Lesson Demo: Seated Body Scan
- III. Understanding Negative Emotions & Resistance
 - a. Negative Emotions in the Classroom (Jennings & Siegel, 2015)
 - b. Lesson Demo: Centering (Jennings & Siegel, 2015)
- IV. Implementation
 - a. Building a practice (Jennings & Siegel, 2015; Stahl & Goldstien, 2010)

Appendix G

EMA Flowchart

Treatment Group Protocol

3x/day

1. Find a time within the next 90 minutes to engage in a mindfulness practice. A few options for mindfulness include a timed meditation, a guided meditation, a full body scan, or a scan of your environment.
2. How would you rate your level of effort in practicing mindfulness? (0-25%, 26-50%, 51-75%, 76-100%)
3. Have you felt stressed since your last time answering or in the past 3 hours? (*not at all, a little, a fair amount, a lot*)
4. What stress management technique(s) have you used since your last time answering or in the past 3 hours? (*mindfulness, distraction, social support, exercise, substance use, none, other*)
5. Toronto Mindfulness Scale

Control Group Protocol

3x/day

1. Have you felt stressed since your last time answering or in the past 4 hours? (*not at all, a little, a fair amount, a lot*)
2. What stress management technique(s) have you used since your last time answering or in the past 3 hours? (*mindfulness, distraction, social support, exercise, substance use, none, other*)
3. Toronto Mindfulness Scale

Appendix H

Final Guide for Coding Mindfulness Definitions

- Keep in mind that the operational definition is that *“mindfulness is a (1) practice of focusing one’s attention to the (2) present moment, (3) without judgement or with curiosity.”*
- Scores can range from 0 to 3 points earned, based on if the definitions capture up to all three components of the operational definition of mindfulness.
- Using the guide below, read each definition of mindfulness and rate accuracy for the number of components of the operationalized definition. **Each component is worth one point.**
 1. Read through the definition looking for component # 1
 2. Re-read the definition looking for component # 2
 3. Re-read the definition looking for component # 3
 4. Provide the total score for the definition in the appropriate column on the spread sheet based on the number of points earned.

Give one point for each of the following components or listed synonyms:

- 1. Purposeful attention/awareness**
 - a. Purposeful / purposefully
 - b. Intentional
 - c. Focused / focus
 - d. Practice
 - e. Act / the act
 - f. Taking steps / taking time / taking a moment / taking a look
 - g. Ability
 - h. Finding a way / find a way
 - i. Process
 - j. Repeated
- 2. In the present moment**
 - a. Present moment / in the present / being present
 - b. Current time / current emotions / current thoughts
 - c. Here and now
 - d. Instant
 - e. The time being
- 3. Non-judgmentally/curious**
 - a. Non-judgmental / don’t judge / without judgment
 - b. Curious / curiosity
 - c. Open minded / open / open and thoughtful
 - d. Accepting
 - e. Compassionate
 - f. Objective
 - g. Inquisitive
 - h. Interested
 - i. Neutral

Appendix I

Please answer the following questions before the first lecture on mindfulness:

1. What is your experience/familiarity with mindfulness? (e.g., heard of it, no experience, tried it a few times, practice routinely)
2. What do you think is the definition of mindfulness?

Please answer the following questions after the second lecture on mindfulness:

1. What do you think is the definition of mindfulness?
2. What did you find helpful from the lectures on mindfulness?
3. Do you think you would consider integrating mindfulness into your future classrooms?
Why or why not?