ORIGINAL PAPER

The Impact of a Mindfulness Intervention on Elementary Classroom Climate and Student and Teacher Mindfulness: a Pilot Study

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Abstract

Objectives Schools have begun to use mindfulness training as one strategy for improving students' academic achievement and social-emotional functioning. The purpose of the current study was to evaluate the effects of a brief mindfulness intervention on classroom climate and academic outcomes (i.e., reading fluency).

Methods Seven elementary school classrooms participated in a 10-week mindfulness intervention and were matched with seven control classrooms. Teachers were trained to implement a 2-min mindfulness-based intervention delivered three times per day.

Results Results from this quasi-experimental study indicated an increase in classroom satisfaction among students participating in the intervention. Students in both control and intervention classes demonstrated increases in friction and decreases in cohesion. Improvements in students' reading fluency were also observed. Teachers in the intervention group reported higher levels of classroom cohesion following the intervention. Both intervention and control group teachers reported changes in classroom climate over time, specifically indicating decreases in friction.

Conclusions Results from this exploratory study illustrate the varied implications and practicality of a brief mindfulness-based intervention in the classroom setting. Improvements in classroom satisfaction were evident for students; decreases in classroom cohesion and increases in friction emerged for both intervention and control groups. Further, discrepancies between teacher and student perceptions of class climate were also determined. These findings suggest that additional factors may be influencing classroom climate. Study limitations and avenues for future research are discussed.

Keywords Mindfulness · Classroom climate · Social-emotional learning · Reading fluency

It is estimated that 13% of children 8–15 years of age have a diagnosable mental health disorder (Center for Disease Control and Prevention 2009) and that the majority of mental health issues begin in adolescence and young adulthood (12–24 years of age). Unfortunately, there is evidence to indicate that approximately 1% of students are receiving services to address mental health concerns, with services primarily occurring in the special education setting (Merrell and Walker 2004). These statistics represent a significant gap in the need for services and the availability of resources to meet those needs.

Schools are often viewed as the primary setting for valuable academic and social skills training for children and adolescents, often within multi-tiered systems of supports (Greenberg et al. 2003). Strategies inspired by universal behavioral interventions (e.g., social-emotional learning instruction that is provided to all students within a classroom or grade) have emerged as evidence-based interventions designed to help address challenges associated with behavioral or emotional concerns among youth. These interventions are designed to serve as a preventative model to combat the onset and/or future development of mental health concerns by focusing on student competencies and problem-solving skills; therefore, it is practical to conceive an expanded role for teaching children these necessary skills in the school setting (Collaborative for Academic and Social-Emotional Learning; CASEL 2013; Metlife 2002). In collaboration with community allies such as mental health professionals and medical personnel, schools are central to promoting resiliency and wellness, increasing school connectedness, and

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fostering the development of protective factors among students (Center for Disease Control and Prevention 2009; NASP 2015). In fact, research has identified school-based interventions as an effective and innovative approach to meeting the needs of at-risk youth (Sklarew et al. 2004; Zirkelback and Reese 2010). School-based programs that support the mental health and well-being of adolescents have been linked to overall wellness, improved reading achievement, and behavioral functioning among school-aged youth (Durlak et al. 2011; Owens and Murphy 2004).

The Collaborative for Social-Emotional Learning (CASEL) is a national organization dedicated to advancing knowledge of evidence-based social and emotional learning assessment and intervention. In 2013, CASEL released a guide to social and emotional learning programs for preschool and elementary school students, citing 23 different programs, including those targeting mental and emotional outcomes, and social skills, such as mindfulness and problem solving (e.g., MindUP (The Hawn Foundation 2011); I Can Problem Solve (Shure 1994)). SEL-based approaches are linked to positive outcomes for students as teachers can help students develop social and emotional skills through direct instruction of specific skills, the utilization of curricula, and the implementation of classroom practices (Cohen 2006; Durlak et al. 2011; Zins et al. 2004). Despite the development of competency models and broad empirical findings, research is beginning to examine the impact of mindfulness practices on outcomes for youth (Greenberg and Harris 2011). Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn 2003, p. 133).

Mindfulness research describes self-regulation and attention as core components of awareness, characteristics often associated with social-emotional learning (CASEL 2013). Mindfulness-based breathing exercises are brief check-ins that can be implemented throughout the day to improve various aspects of physical and psychological health (Beauchemin et al. 2008; Sibinga et al. 2011). Due to the broad scope of mindfulness and positive outcomes associated with regular practice, there is a need for research to illustrate how SEL-based practices, like mindful breathing strategies, can be implemented universally in the school setting.

Given the link between social-emotional competence and school achievement, educators have been tasked with not only monitoring students' academic growth but also their social and emotional development (Zins and Elias 2007). CASEL describes SEL in terms of a process, "one that is based on the understanding that the best learning emerges in the context of relationships that make learning challenging, engaging, and meaningful; social and emotional skills are critical to being a good student…" (CASEL 2013, p. 9). A number of previous studies have examined school-based SEL interventions and

reported significant improvements in students' social and emotional skills, antisocial and aggressive behavior, depressive symptoms, drug use, mental health, and academic performance across K-12 settings (Durlak et al. 2011; Durlak et al. 2011; Greenberg et al. 2001; Sklad et al. 2012; Taylor et al. 2017; Tobler et al. 2000; Zins et al. 2004). Current literature has identified a theoretical link between mindfulness and social-emotional learning, tying together multiple factors of attention and awareness that are discussed in a social-emotional context (Lawlor 2016). SEL has been discussed extensively as a factor contributing to the development of social and emotional skills, attitudes about self and others, prosocial behaviors, conduct, emotional distress, and academic achievement (Durlak et al. 2011).

Research has identified the positive effects of mindfulness among adolescents. For example, several studies have used mindfulness meditation to show improvements in cardiovascular functioning for African American adolescents with high blood pressure or risk of hypertension, with improvements in student absenteeism, suspension rates, levels of hostility, and school infractions (e.g., Gregoski et al. 2010; Wright et al. 2011). Other studies have identified links between mindfulness meditation and improvements in Attention Deficit Hyperactivity Disorder (ADHD) and learning disabilities, in addition to improvements in internalizing and externalizing behaviors, anxiety, and academic performance (Beauchemin et al. 2008; Semple et al. 2009).

As children and adolescents spend a significant amount of their day in a structured school setting characterized by routine activities, mindfulness interventions have demonstrated success when implemented in an intentional and routine way, often through the use of an established curriculum (Klingbeil et al. 2017). Previous systematic reviews and meta-analytic work examining mindfulness interventions within schools have demonstrated promising results, suggesting small treatment effects across a variety of outcomes, including improvements in cognitive performance, social competence, prosocial behaviors, positive emotions academic performance, and resilience to stress (Zenner et al. 2014). Limitations include small sample sizes that are often underpowered, lack of randomization, lack of student demographic information, different definitions in outcome domains, and difficulties measuring effects of mindfulness (Felver et al. 2016; Zenner et al. 2014). While mindfulness curricula provide structure and processes for implementation, few studies have addressed mindfulness strategies in a universal way (Greenberg and Harris 2011), with limited evidence around the utility of brief mindfulness strategies in the school setting (Napoli et al. 2005) and few studies examining academic outcomes (Klingbeil et al. 2017).

The current literature identifies a link between consistent mindfulness routines and improvements in physical (e.g., Baer et al. 2012; Morone et al. 2008) and psychological conditions among adults (e.g., Brown and Ryan 2003; Geschwind

et al. 2011). These findings are meaningful, as they may help inform physical and psychological symptoms that arise as a result of occupational stress. Teaching is a profession often characterized by burnout, fatigue, and emotional exhaustion (Hakanen et al. 2006; Maslach et al. 2001). By incorporating a brief mindfulness-based practice into the classroom setting, teachers may experience a renewed connection to the classroom, and observe improvements in the relationships they share with their students (Flook et al. 2013; Meiklejohn et al. 2012). There are multiple training programs that promote mindfulness and resilience in teachers, including The SMART in Education Program (Impact Foundation 2007), and The CARE Program (The Garrison Institute 2007). Initial results from the CARE Program have demonstrated improvements in mindfulness, well-being, and motivation in building a supportive classroom climate (Jennings et al. 2011b).

Class climate is a "nebulous" concept (Evans et al. 2009, p. 131) despite extensive research that has linked climate to students' cognitive, motivational, and social development. According to Ambrose et al. (2010), "climate is determined by a constellation of interacting factors" (p. 170), including student's intellectual, emotional, social, and physical environments. Each of these four environments not only contributes to the greater system that is a classroom climate but also to students' overall ability to learn. A positive classroom climate that promotes learning is one where students are encouraged to pursue challenges, take risks, and ask questions. Students may have a sense of belonging where they trust their peers and their teachers (Bucholz and Sheffler 2009). Despite varying conceptualizations, research suggests that student perceptions of healthy and positive classroom climate are linked with improvements in academic achievement, engagement, and overall success (Furrer and Skinner 2003; Skinner et al. 2008). However, the research is limited on the effects of mindfulness instruction on classroom climate. SEL has been discussed as a valuable element in terms of a healthy school climate (e.g., Cohen 2006; Collie et al. 2012; Greenberg et al. 2003). Despite these theory-based discussions and broad empirical findings, research has yet to examine the role of a brief mindfulness intervention and its impact on class climate. Although current literature supports hypotheses indicating improvements in student well-being and behavior across diverse groups (Black and Fernando 2014), additional research is needed to examine the role of mindfulness in classroom climate, and what impact mindful practices may have on other classroom factors linked to classroom climate, such as academic achievement.

Research examining the intersection of mindfulness and academic performance has been limited, with available studies reporting mixed results. A systematic review of 61 studies examining the impact of mindfulness interventions on cognition, academic achievement, behavior, and social-emotional functioning suggested consumers use caution in the interpretation of mindfulness and academic achievement, as these findings may be overstated in various studies, compared to improvements observed in cognitive and social-emotional outcome measures (Maynard et al. 2017). Given the difficulty linking associations between mindfulness and academic achievement, the authors suggest additional data are needed in future research, including more details regarding intervention constructs (e.g., duration and length of the intervention), the connection to academic outcomes, and financial feasibility. Previous academic research has examined the use of brief measures, such as curriculum-based measurement tools, to evaluate student academic performance in basic academic skills across subject areas such as reading, math, and writing (Deno 1985; Fuchs and Deno 1991; Shinn 1989). Of these, oral reading fluency measures have the largest empirical evidence to date (Reschly et al. 2009). These tools are defined as a measure of student's ability to read connected text with accuracy and speed (Hasbrouck and Tindal 2006) and are highly correlated with student reading performance (Reschly et al. 2009).

The current study examined the impact of a brief mindfulness intervention on student and teacher levels of class climate and mindfulness, as well as its impact on student academic performance. This was examined through implementation of two-minute breathing exercise strategies scheduled at three time points throughout the day (i.e., morning upon arrival, return from lunch, end of the day before departure). The current study explored two core research questions: (1) Does participation in a brief mindfulness activity lead to improved student reports of levels of mindfulness, classroom climate, and academic achievement?; and (2) Does leading a brief mindfulness activity influence teachers' self-reported levels of mindfulness and classroom climate?

Method

Participants

The current study included 14 classrooms across two elementary schools in the southwestern USA. This included seven fourth grade teachers and seven fifth grade teachers and their students (see Table 1). Fifty-seven percent of teachers were Hispanic/Latino, whereas the remaining 43% of teachers were White. Seventy-nine percent of teachers were female and 21% male. The average number of years teaching was 14.12 years. The majority of teachers in the current study earned a Bachelor's degree (86%), and two teachers earned a Master's degree. Of the 296 student participants, 87% were Hispanic/Latino. Students were 53% female and 47% male. Fifty-four percent of participating students were in the 4th grade, and 46% were in the 5th grade. The free or reduced lunch status at each school was 87% and 88%, respectively.

Table 1 Demographic statistics for students & teachers

Demographics	Teacher n (%)	Student n (%)
Age—Student		
Mean = 9.3 years	–	–
Gender		
Female	11 (79%)	158 (53.4)
Male	3 (21%)	138 (46.6)
Race		
White	6 (43%)	253 (86.8%)
Hispanic/Latino	8 (57%)	–
Native American/American Indian	0 (0%)	38 (12.8%)
African American	0 (0%)	1 (.3%)
Multiple races	0 (0%)	4 (1.4%)
Hispanic		
Yes	–	257 (86.8%)
No	–	39 (13.2%)
Grade		
4th grade	7 (50%)	159 (53.7%)
5th grade	7 (50%)	137 (46.3%)
Condition		
Intervention	7 (50%)	138 (46.6%)
Control	7 (50%)	158 (53.4%)
Years of experience—teacher		
Mean years = 14.12 years	–	–
Highest degree earned—teacher		
Bachelor's	12 (86%)	–
Master's	2 (14%)	–

Procedures

Once consent was obtained from district and school administrators, a presentation was made to all fourth and fifth-grade classroom teachers at each school to describe the study and obtain teacher consent. Informational parent letters were sent home with each student, describing the mindfulness intervention. All study procedures were conducted in accordance with a university-approved Human Subjects Institutional Review Board (HSIRB) protocol.

One week prior to the start of the intervention, students and teachers completed a brief battery of measures to assess class climate and mindfulness skills. A researcher was available to read aloud the questionnaires as needed, to reduce potential biases associated with reading proficiencies. At the conclusion of survey administration, the researcher described brief mindfulness exercises students would be learning and practicing in the classroom. Students and teachers began integrating exercises into the classroom routine 1 week after survey administration was completed, and approximately 6 weeks after the start of the school year to allow for maturation of the classroom environment (e.g.,

establish routines, understand expectations) (Center for Responsive Schools 2015). Teacher participants were given a modest stipend to compensate them for their time, half disbursed at the initial training and half at the conclusion of the study.

To examine the effects of the mindfulness intervention, a quasi-experimental design was employed across two schools. Fourth-grade classrooms at one school served as the intervention group while fifth-grade classrooms served as the control group; at the second school, fourth-grade classrooms served as the control group while fifth-grade classrooms received the mindfulness intervention. Control classrooms were invited to participate in the mindfulness training at the conclusion of the current study. Counterbalancing was considered necessary to ensure equal distribution of students across grades within each group. It should also be noted that the two schools were in the same school district, were located approximately a mile apart, and had nearly identical student and teacher demographics.

To aid in monitoring fidelity of implementation, a teacher log was created, which outline the steps teachers needed to take each time the intervention was delivered. Teachers were trained to use the log in order to assess fidelity of implementation. Teacher-reported implementation fidelity was calculated as the percentage of exercises completed in relation to the number of exercises scheduled. Implementation fidelity ranged between 64 and 74% with a mean of 68%, based on teacher logging data. Teachers reported barriers to implementation included lack of time or forgetting to implement. A graduate researcher trained in the intervention and observation practices visited classrooms once a week to monitor implementation fidelity by recording time of implementation, exercise selected, the number of students in the room, whether the script was referenced, and whether reflection time was granted. Implementation fidelity data based on external observations indicated teacher's implementation ranged between 93 and 95%, with a mean of 93%, based on researcher observational data.

Mindfulness Interventions: Mindful Moments *The Mindful Moments* intervention is a teacher-led training underpinned by Kabat-Zinn's (2003) MBSR training, where the focus is to help students enhance awareness in a non-judgmental way and reflect on the experience of that awareness. The training was developed through a partnership with two community scholars with advanced knowledge of mindfulness, who develop and lead trainings focusing on structured breathing and movement exercises. The strategies are adapted from a college student training inspired by Transcendental Meditation, mindful breathing, Tai Chi, and compassion practices. The intervention is designed to have teachers lead students through a brief *Mindful Moment* at three times points throughout the day (i.e., morning, lunch recess, afternoon). The mindful moment sequence is as follows: (1) Introduce name of exercise (e.g., foot release) and provide brief introduction to mindfulness; (2)

Lead students in part of exercise (e.g., foot release 1) or full exercise (e.g., foot release 1 and 2), referring to script as necessary; (3) Reflect on exercise, take at least one student's comment (e.g., what did you notice?); and (4) Note completion on teacher log. Teachers were trained to engage students in the following sequence, described in more detail below.

During the first 2 weeks of the intervention, teachers introduced and reviewed a menu of 19 mindfulness-based movement, breathing, stretching, and body awareness exercises (see Table 2) (i.e., shoulder release 1–2, neck release 1–3, foot release 1–2, breathing tall 1, rising mountain 1, breathing deeply 1–4, square breathing 1–3, and focused breathing 1–5) in the same sequence. Teachers were trained to lead all 19 abbreviated exercises and combine shorter exercises to form a full exercise. In week 3, teachers led students in a full exercise three times per day. The purpose of this structured introduction was to orient students to the core elements of each exercise. A script for each exercise was provided in the teacher training guide. After introduction of abbreviated and full exercises in weeks 1–3, teachers were instructed to utilize menu items that best fit the structure of their classroom and the needs and requests of their students. Exercise choice is evident in adult mindfulness research (e.g., Carmody and Baer 2008; Goretzki and Zysk 2017) and may help facilitate student buy-in and ongoing commitment to practice. Further, research examining learner-centered instruction indicates that students tend to learn more when instruction is personally meaningful; this can be accomplished in several ways, such as linking school goals with student goals (Brandt 1998), offering students choices about what they learn (Protheroe 2007), and providing opportunities to demonstrate what they learn (Tomlinson 2005). Teachers were trained to acquire feedback from the class, providing students with the opportunity to reflect on the exercise (e.g., "What did you notice?"). The exercises occurred for approximately 90 s, with 30 s of "self-sensing," where students were given a brief silent moment to feel the effects of what they had just completed and reflect on the experience.

Teacher Training Seminar Two weeks prior to beginning the intervention, teachers were trained to lead brief in-class mindfulness exercises known as "*Mindful Moments*" in a 2-h training seminar, and were provided a training guide outlining all elements of the mindfulness strategies. The purpose of this training was to help teachers internalize the mindfulness experience with strategies adapted from traditional mindfulness techniques. The strategies contributing to this teacher guide are underpinned by Kabat-Zinn's (2003) MBSR training, where the focus is to enhance awareness in a nonjudgmental way and reflect on the experience of that awareness. Key components to the training included: (1) experience, (2) reflection, and (3) practice. These components guided the instruction of the mindful stretches and conscious breathing exercises, whereby teachers experienced the exercise as a facilitator and participant, reflected on the experience, and then practiced the exercise with a partner. The menu of 19 mindfulness-based movement, breathing, stretching, and body awareness exercises (see Table 2) was provided in the teacher

Table 2 Menu of breathing exercises

Full exercise	Parts	Action (synced with inhale and exhale)
Shoulder release (SR)	1	Both shoulders together
	2	One shoulder at a time
Neck release (NR)	1	Rotation (turn head to side)
	2	Flexion & extension (tipping head forward and back)
	3	Lateral flexion (tilting head to side)
Foot release (FR)	1	Lifting ball of foot
	2	Lifting heel
Breathing tall (BT)	1	Lengthening the spine
Rising mountain (RM)	1	Arms rise with inhale, return to side with exhale
	2	Bending forward at hips
Breathing deeply (BD)	1	Into belly
	2	Into ribs
	3	Lifting collar bone
Square breathing (SB)	1	Inhale 4, exhale 4
Focused breathing (FB)	1	In the belly
	2	In the chest
	3	In the throat
	4	In the nostrils
	5	At the point between the eyebrows

training guide. Teachers were instructed to use reflective inquiry (e.g., "What did you notice about the exercise?") in order to encourage student use of self-reflection and thus facilitate improvements in mindful practice. A 30-min follow-up training was provided 3 weeks into the program to provide consultation to teachers, discuss barriers, and evaluate implementation fidelity and integrity. Researchers conducted weekly, in-person consultation meetings with teachers (i.e., 10-min sessions during teacher prep time) and were available via email to answer questions and monitor progress during the 10-week intervention. Implementation science research has highlighted the importance of providing training not only prior to beginning an intervention, but also the need for sustained technical assistance (i.e., training) throughout implementation, paired with ongoing consultation (Meyers et al. 2012).

Measures

Each teacher completed a demographic form including name, age, race, degree, and years of experience. Teachers were asked to describe any previous experience with mindfulness exercises or activities, and whether exercises of this nature have been previously integrated into their current classroom setting. Student participant information was gathered from district records.

The Kentucky Inventory of Mindfulness (KIMS; Baer et al. 2004) The KIMS is a 39-item measure of mindfulness designed to assess changes in mindfulness skills in adults over time and has been used to assess shorter mindfulness-based interventions in previous studies (e.g., Bergen-Cico et al. 2013). It was used to assess levels of mindfulness among teachers in the current study. The KIMS is drawn from four mindfulness constructs, including observing (12 items; e.g., "I notice changes in my body, such as whether my breathing slows down or speeds up."); describing (8 items; e.g., "I'm good at finding words to describe my feelings"); acting with awareness (10 items; e.g., "When I do things, my mind wanders off and I'm easily distracted."); and accepting or allowing without judgment (9 items; e.g., "I criticize myself for having irrational or inappropriate emotions."). Respondents rate each item on a 5-point Likert-type scale (0 = never or very rarely true, 5 = almost always or always true). Empirical data indicates the KIMS demonstrates good internal consistency (.83–.91) and test-retest reliability (.65–.86), as well as concurrent validity (.57) (Baer et al. 2004).

Child and Adolescent Mindfulness Measure (CAMM; Greco et al. 2011) The CAMM is a ten-item self-report measure examining facets of attention, awareness, and acceptance, and is used to assess changes in child and adolescent mindfulness skills over time. The CAMM aligns with current definitions of mindfulness and is appropriate for use with children 9 years of age and above. The CAMM uses a five-point Likert scale (0 = never true, 4 = always true) to measure the extent to which children and adolescents observe internal experiences (e.g., "I pay close attention to my thoughts"), accept internal experiences without judgment (e.g., "I get upset with myself for having certain thoughts" [reverse scored]), and act with awareness (e.g., "I walk from class to class without noticing what I'm doing" [reverse scored]). The CAMM yields an overall mindfulness score, with higher scores being indicative of higher levels of mindfulness. Validation studies examined validity coefficients and found the measured mindfulness trait was unique from similar constructs in youth (i.e., social skills). Empirical data have shown the CAMM has good internal consistency (a = .84) and concurrent validity; CAMM scores were negatively correlated with child-reported somatic complaints, internalizing symptoms, externalizing behavior problems, thought suppression and psychological inflexibility, and positively correlated with overall quality of life and social skills (Greco et al. 2011; Walker and Garber 2001).

My Class Inventory—Short Form Revised (MCI—SFR; Sink and Spencer 2005) The MCI—SFR is a 20-item measure examining five dimensions of classroom climate, including Satisfaction (the extent to which students feel satisfied with or like their class; e.g., "Students in my class enjoy their school work"); Friction (the extent of tension and conflict among students; e.g., "Students are always fighting with each other"); Competitiveness (the perceived amount of classroom competition; e.g., "Students often race to see who can finish first"); Difficulty (the level of difficulty students associate with classroom assignments); and Cohesiveness (the extent to which students understand, collaborate, and are friendly with one another; e.g., "In my class, everyone is my friend"). Children were asked to respond yes or no to each question, indicating their agreement or disagreement to each statement. The MCI—SFR provides subscale scores indicative of student perceptions of classroom climate in each of the aforementioned five domains. The original validation study remains the primary study for this measure, yielding acceptable levels of reliability and validity (Sink and Spencer 2005). Coefficients for Difficulty ($r = .52$), Competitiveness ($r = .65$), Satisfaction ($r = .69$), Friction ($r = .71$), and Cohesiveness ($r = .72$) indicated low to moderate internal consistency, respectively.

My Class Inventory—Teacher Form (MCI—TF; Sink and Spencer 2007) The MCI—TF is a 30-item companion inventory to the student version of the MCI—SFR. This instrument utilizes six scales to examine teachers' perceptions of their classroom climate: (1) overall student Satisfaction with the learning experience (e.g., "The students enjoy their school

work in the class"); (2) Friction (e.g., "Students never fight with each other"); (3) Difficulty level of classroom materials; (4) student Competitiveness; (5) Cohesion (e.g., "In the class, everyone is friends"); and 6) School Counselor Impact on the learning environment (e.g., "The school counselor helps students feel good about learning in the classroom"). Teachers rated each item using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) that result in five domain scores as described above. Similar to the student measure, the original validation study remains the primary analysis of reliability and validity, with strong indicators evident. Preliminary alpha coefficients for each scale indicated acceptable consistency across four of the five scales: Satisfaction ($r = .83$); Competitiveness ($r = .57$), Friction ($r = .73$), Difficulty ($r = .74$), and Cohesiveness ($r = .79$). The MCI-Teacher includes a School Counselor Impact scale, which was not utilized in the current study.

Reading and Analysis Prescription System 360 (RAPS 360; MindPlay 2012)

RAPS 360 is a criterion-referenced, computer-based reading assessment designed to assess performance across eight domains. The current study utilized the reading fluency measure as a brief measure of student academic achievement. Reading CBM scores were used as an indicator of reading proficiency given the rich CBM psychometric literature, which suggests Reading CBM tools can be used as a general outcome measure of overall reading (Fuchs and Deno 1991: Reschly et al. 2009). The current fluency screening measure (as measured by words read correctly per minute [WPM]) is a timed test used to assess reading fluency. Students are encouraged to read the text as quickly and accurately as possible. After the story has been read, questions about the story are given to verify that the student understood what was read. Students may achieve a fluency score of up to 235, which is the total number of words in any given passage. Empirical evidence gathered from three separate validation studies indicates adequate correlations ($r = .81$) and concurrent validity with the Metropolitan Achievement Test—Eighth Edition (MAT – 8; Harcourt Brace Educational Measurement 2000), with an absolute $r = .51$ (MindPlay 2012). All students, as part of typical school and district procedures, completed these measures in the fall, winter, and spring to assess each student's reading performance. Data points from the fall (early September, pre-intervention) and winter (late November, post-intervention) time points were included in the current study to align with the intervention schedule.

Data Analysis

Prior to inferential analyses, data were evaluated using descriptive analysis procedures to identify means scores for mindfulness, class climate, and reading fluency benchmarks within each condition. A series of two-way ANOVAs were then conducted to examine if differences between students on the independent variables (i.e., condition, time) were related to the dependent variables (i.e., perceptions of mindfulness, class climate, and reading fluency scores). The independent variables represented a categorical variable for condition (1 = intervention, 2 = control) and time (1 = pre-intervention, 2 = post-intervention). A second two-way ANOVA was conducted to examine if differences between teachers on the independent variables (i.e., condition, time) were related to the dependent variables (i.e., perceptions of mindfulness, class climate). Similar to the student model, the independent variables represented a categorical variable for condition (1 = intervention, 2 = control) and time (1 = pre-intervention, 2 = post-intervention). Effect sizes were calculated using partial eta squared.

Results

Descriptive Statistics

Table 3 summarizes students' data obtained across pre- and post-intervention phases for each of the three measures, including means and standard deviations for each scale. Table 4 summarizes teacher data obtained across pre- and post-intervention phases for the two-teacher completed measures. All 14 teachers indicated on the preliminary questionnaire they had not previously received any training in mindfulness.

Student Outcomes

Mindfulness A series of between-within subjects analysis of variance (ANOVAs) were conducted. Unless indicated, Levene's Test of Equality of Error Variances and Box's Test of Equality of Covariance were not significant, therefore homogeneity of variance was not violated. The first ANOVA was conducted to examine the impact of the condition (mindfulness intervention, control) and time (pre, post) on mindfulness skills in children. In this case, no main effect for time (pre-, post-test) was found, Wilk's Lambda = .99, $F(1, 245) = 3.44$, $p = .07$, partial eta squared = .01. Further, the main effect for condition was also non-significant, $F(1, 245) = .48$, $p = .49$, suggesting no differences in student levels of mindfulness across the intervention and control classrooms.

Classroom Climate The remaining ANOVAs were conducted to examine the impact of the intervention on class climate. The class climate measure examines four separate subscales, including satisfaction, friction, competition, and cohesiveness, each yielding a separate subscale score. For satisfaction, Levene's Test of Equality of Error Variances (MCI Satisfaction Pre = .33, MCI Satisfaction Post = .04) indicates

Table 3 Student descriptive statistics across outcome variables

Measure	Target Variable	Condition	Pre-intervention mean (SD)	Post-intervention mean (SD)
Child & Adolescent Mindfulness Measure (CAMM)—Student	Mindfulness	Intervention	23.79 (6.929)	24.39 (6.5)
		Control	23.32 (6.33)	24.45 (6.5)
My Class Inventory (MCI) —Student	Satisfaction	Intervention	12.34 (2.5)	12.39 (2.27)
		Control	11.69 (2.65)	10.85 (2.89)
	Friction	Intervention	8.76 (2.90)	9.24 (3.07)
		Control	9.39 (3.06)	10.36 (3.00)
	Competitiveness	Intervention	10.86 (3.2)	10.92 (3.29)
		Control	10.93 (2.95)	10.82 (3.08)
	Cohesion	Intervention	10.43 (2.84)	10.06 (3.33)
		Control	10.9 (3.03)	10.07 (2.93)
Reading & Proficiency System (RAPS) 360—Student	Fluency (WPM)	Intervention	93.89 (43.28)	97.90 (46.77)
		Control	84.1 (37.29)	91.28 (40.4)

Note. The CAMM yields an overall mindfulness score, up to 40, with higher scores being indicative of higher levels of mindfulness. The MCI—SFR yields an individual score for each of the four scales, each producing a possible score of 15 points. Higher ratings are desirable for Satisfaction and Cohesion. Conversely, lower scores are preferable for Friction and Competitiveness. The RAPS yields a raw score for fluency (WPM)

a non-significant result for pre-intervention scores, whereas post-intervention scores were significant. The latter suggests that any effects should be interpreted with caution, as post-intervention scale variances were not equally distributed. Box's Test of Equality of Covariance Matrices (.02) was also significant, further cautioning interpretation. The main effect for time was not significant, Wilk's Lambda = .99, F (1, 220) = 3.34, p = .07, partial eta squared = .02. Between-

subjects analysis yielded a significant result for condition, F (1, 220) = 15.39, p = .00, suggesting there is a difference between classrooms that received a mindfulness program, and those classrooms that did not, with higher means observed for the intervention group.

For friction, the main effect for time was significant F (1, 230) = 13.26, p = .00, partial eta squared = .06, whereby the friction scores demonstrated an increase from baseline to

Table 4 Teacher descriptive statistics across outcome variables

Measure	Target variable	Condition	Pre-intervention mean (SD)	Post-intervention mean (SD)
Kentucky Inventory of Mindfulness Skills (KIMS)—Teacher	Observe	Intervention	37.86 (7.71)	42.29 (6.52)
		Control	40.14 (7.71)	42.14 (5.98)
	Describe	Intervention	28.29 (3.50)	29.00 (4.76)
		Control	32.71 (5.99)	32.42 (3.55)
	Act with awareness	Intervention	29.43 (2.88)	31.29 (4.54)
		Control	31.86 (4.43)	32.14 (4.02)
	Accept without judgment	Intervention	30.57 (5.83)	32.00 (5.29)
		Control	31.71 (5.65)	33.14 (3.89)
My Class Inventory (MCI)—Teacher	Satisfaction	Intervention	23.14 (1.21)	23.43 (1.62)
		Control	19.71 (4.19)	20.86 (4.38)
	Friction	Intervention	17.43 (2.23)	16.86 (3.24)
		Control	22.14 (3.18)	20.86 (3.29)
	Competitiveness	Intervention	19.29 (2.50)	19.00 (2.38)
		Control	19.00 (2.58)	19.71 (2.50)
	Difficulty	Intervention	14.86 (1.77)	14.14 (2.67)
		Control	17.43 (3.41)	17.86 (4.22)
	Cohesion	Intervention	21.00 (1.91)	21.86 (1.77)
		Control	16.86 (3.24)	17.00 (4.24)

Note. The KIMS yields an individual score for each individual subscale, with higher scores being indicative of higher levels of mindfulness. The MCI—SFR yields an individual score for each of the five scales, each producing a possible score between 5 and 25 points. Higher ratings are desirable for Satisfaction and Cohesion. Conversely, lower scores are preferable for the Friction, Competitiveness, and Difficulty scale

post-intervention in both intervention and control groups. Between-subjects analysis yielded a significant result for condition, $F(1, 230) = 6.19$, $p = .014$, with higher rates of friction reported by students in the control group compared to students in the intervention group at the conclusion of the intervention.

Levene's Test of Equality of Error Variances (MCI Competitiveness Pre = .03, Post = .37) for competition indicates a significant result for pre-intervention scores, whereas post-intervention scores were non-significant. The former suggests that any effects should be interpreted with caution, as pre-intervention scale variances were not equally distributed. The main effect for time was not significant, Wilk's Lambda = 1.0, $F(1, 230) = .002$, $p = .97$, partial eta squared = .00. Between-subjects analysis yielded a non-significant result for condition, $F(1, 230) = .00$, $p = .99$, indicating no differences between the two conditions on the competition subscale.

For cohesion, Levene's Test of Equality of Error Variances (MCI Cohesion Pre = .58, Post = .01) indicated a non-significant result for pre-intervention scores, whereas post-intervention scores were significant. The latter suggests that any effects should be interpreted with caution, as post-test scale variances were not equally distributed. The main effect for time was significant, Wilk's Lambda = .97, $F(1, 230) = 7.29$, $p = .01$, partial eta squared = .03, with decreases in cohesion scores observed in both intervention and control classrooms. Between-subjects analysis yielded a non-significant result for condition, $F(1, 230) = .83$, $p = .36$, suggesting no differences between intervention and control groups.

Reading Fluency An individual mixed between-within subjects ANOVA was conducted to examine the impact of the intervention on reading fluency. The main effect for time was significant, Wilk's Lambda = .98, F $(1, 286) = 6.44$, $p = .012$, partial eta squared = .02, with increases in reading fluency observed in both intervention and control groups. Between-subjects analysis yielded a non-significant result for condition, $F(1, 286) = 3.51$, $p = .06$, suggesting no differences between the two conditions. Wilk's Lambda (1.0) indicated no interaction effect, $F(1, 286) = .73$, $p = .40$, partial eta squared = .003.

Teacher Outcomes

Mindfulness Four separate mixed between-within subjects analysis of variance (ANOVA) were conducted to examine the impact of the condition (intervention, control) and time (pre, post) on mindfulness in adults. The KIMS (Baer et al. 2004) was used to assess four mindfulness constructs (i.e., observing, describing, acting with awareness, accepting without judgment). No main effect for time (pre-, post-test) was found, Wilk's Lambda = .72, $F(1, 12) = 4.57$, $p = .054$, partial eta squared = .28. Further, the main effect for condition was

also non-significant, $F(1, 12) = .10$, $p = .76$, suggesting no differences in mindfulness between teachers in the intervention and control classrooms.

A second ANOVA examined the impact of time and condition on describing. Here, no main effect for time was found, Wilk's Lambda = .99, $F(1, 12) = .07$, $p = .79$, partial eta squared = .006; the main effect for condition was also non-significant, $F(1, 12) = 2.90$, $p = .11$, suggesting no difference between the two conditions. The third ANOVA evaluated time and condition on acting with awareness. In this case, no main effect for time was found, Wilk's Lambda = .73, $F(1, 12) = 4.26$, $p = .06$, partial eta squared = .27; condition also failed to produce a significant result, $F(1, 12) = .63$, $p = .44$. The final ANOVA for mindfulness examined the effects of time and condition on accepting without judgment. In this case, no main effect for time was found, Wilk's Lambda = .90, $F(1, 12) = 1.41$, $p = .26$, partial eta squared = .11; condition also failed to produce a significant result, $F(1, 12) = 9.14$, $p = .66$.

Classroom Climate Five individual mixed between-within subjects ANOVAs were conducted to examine teacher-reported outcomes of the impact of the intervention and time on class climate. The class climate measure examines five separate subscale scores (i.e., satisfaction, friction, competition, difficulty, and cohesiveness). Levene's Test of Equality of Error Variances (MCI Satisfaction Pre = .01, Post = .07) on satisfaction indicates a significant difference for pre-intervention scores, whereas post-intervention scores were not significant. The former suggests that any effects should be interpreted with caution, as pre-intervention scale variances were not equally distributed. Box's Test of Equality of Covariance Matrices (.02) was also significant, further cautioning interpretation. The main effect for time on satisfaction was not significant, Wilk's Lambda = .91, $F(1, 12) = 1.26$, $p = .28$, partial eta squared = .10. Between-subjects analysis yielded a non-significant result for condition, $F(1, 12) = 3.59$, $p = .08$, suggesting no difference in levels of satisfaction between intervention and control classrooms. For friction, the main effect for time was not significant, Wilk's Lambda = .85, $F(1, 12) = 2.2$, $p = .17$, partial eta squared = .15. Between-subjects analysis yielded a significant result for condition, $F(1, 12) = 8.63$, $p = .01$, partial eta squared = .42; there was a difference in friction between intervention and control classrooms. While both classrooms demonstrated a decrease in friction stores from pre- to post-intervention, the control group demonstrated a more significant drop in friction scores. The main effect for time on competition was not significant, Wilk's Lambda = .99, $F(1, 12) = .11$, $p = .75$, partial eta squared = .01. Between-subjects analysis yielded a non-significant result for condition, $F(1, 12) = .03$, $p = .86$, suggesting there is no difference in competition between the two conditions. The main effect for time on difficulty was not significant, Wilk's Lambda = .99, $F(1, 12) = .08$, $p = .79$, partial eta squared =

.01. Between-subjects analysis yielded a non-significant result for condition, $F (1, 12) = 3.85$, $p = .07$, suggesting no differences on levels of difficulty between the two conditions. The main effect for time on cohesion was not significant, Wilk's Lambda $= .93$, $F (1, 12) = .92$, $p = .36$, partial eta squared $= .07$. Between-subjects analysis yielded a significant result for condition, $F (1, 12) = 9.01$, $p = .01$, indicating a difference in levels of cohesion between classrooms exposed to a mindfulness intervention and those that were not. While both intervention and control groups yielded an increase in cohesion scores, the intervention group demonstrated a significantly higher score, suggesting higher levels of classroom cohesion.

Discussion

The purpose of the current study was to examine the implementation of a brief mindfulness intervention on teacher and student perceptions of mindfulness and classroom climate, and student reading achievement. Specifically, how can mindfulness affect change in the classroom, including (1) self-reports of mindfulness, (2) peer relationships, (3) satisfaction, (4) competition, (5) cohesiveness, and (6) reading fluency. Study hypotheses predicted that routine participation in a daily mindfulness exercise would result in increases in mindfulness skills and perceptions of classroom climate (i.e., increases in ratings for satisfaction and cohesion, decreases in ratings for friction and competition) among teachers and students, in addition to improvements in reading fluency among students. Results suggest students demonstrated improved perceptions of satisfaction and cohesion for the intervention group and increases in reading fluency for both the intervention and control groups. However, results revealed no changes in levels of student mindfulness. Similar to student self-reports, teachers in intervention groups reported improvements in classroom climate but did not report increases in levels of mindfulness.

Student Outcomes

The classroom climate scale assessed student perceptions of climate across four subscales, with higher scores reported on satisfaction and cohesion scales, and lower scores reported for friction and competitiveness for students in the intervention group. In particular, findings indicated that students in the intervention group reported significantly higher ratings of satisfaction at post-intervention, in comparison to the control group. It is important to note that the intervention group reported higher levels of satisfaction initially, with a small increase in satisfaction over time; however, satisfaction rates declined for the control group from pre- to post-intervention. Certainly, implementation of the mindfulness intervention may have helped students sustain high satisfaction scores as

the mindfulness practices were exercises that promoted increased engagement between students and teachers. Specifically, teachers asked students to engage in the reflective moment at the conclusion of each exercise, thereby enhancing student's attention to not only their individual experiences but also to connect with the similar or different experiences of their peers. This also provided teachers an opportunity to listen and learn from their students. Although the literature has yet to explore classroom satisfaction as an outcome variable for mindfulness, there is evidence to suggest that mindful practices may improve teacher satisfaction (Jennings et al. 2011a), which may help inform our understanding of teachers' satisfaction influencing student satisfaction. Developing this reciprocal attention to each others' learning may have contributed to improvements in student's satisfaction with classroom climate. Alternatively, both intervention and control groups reported higher ratings of friction at the conclusion of the intervention, with higher rates of student friction reported in control classrooms. These results may seem unexpected; however, significantly higher levels of friction for the control group may suggest that despite overall increases, mindfulness practices may have mitigated potentially higher rates of friction for intervention students.

In the context of student reading achievement, both intervention and control groups yielded significant increases in reading fluency (WPM) scores across time, although greater gains were observed in the intervention group (although these differences were not statistically significant). Certainly, improvements in fluency are to be expected with consistent and effective instruction, as students spend up to 90-min each day building literacy skills; however, results suggest that improvements in fluency are not necessarily attributable to the mindfulness intervention, as there were no significant differences between groups. Current literature suggests that the amount and type of instruction in reading influences achievement (e.g., Sonnenschein et al. 2010). Future studies may consider enumerating the amount and level of reading instruction and examining the influence of mindfulness within these observations. Savage et al. (2006) noted that reading skills require cognitive processes, including working memory and attention. Commodari and Guarnera (2005) reported findings supporting this assertion. "Poor readers showed the worst performance on the Digit Span test that measures simple immediate span of attention. These data agree with previous studies in which the relationship between reading and memory has been highlighted" (p. 383). With attention and memory playing a critical role in information processing, a fundamental facet of reading, future studies might consider the role of a mindfulness exercise as a way to improve attention and memory, with distal impacts on reading, as the current study did not explicitly examine variables of attention and memory.

The current study did not produce a significant relationship between exposure to a mindfulness intervention and student increases in their own mindfulness. A number of factors may have contributed to the absence of effects, including (1) intervention fidelity, which may have been too low to produce effects, (2) if the length of the exercises (2–3 min) and intervention (10 weeks) were long enough to produce effects, and (3) if the use of a more extensive teacher script would have impacted outcomes. Future research should also explore maintenance of gains over time to examine if levels of mindfulness extend past the conclusion of the intervention, particularly in the context of classroom climate. There is evidence to suggest that gains can be maintained over time, as one study noted, "Longitudinal comparisons of self-report data showed that pupils participating in the [mindfulness] program reported significant improvements in negative affect with a large effect size at [3-month] follow-up compared to the control group" (Vickery and Dorjee 2016, p. 10).

Teacher Outcomes

Teacher-reported changes were evident in levels of classroom climate. First, a significant difference in friction was determined between intervention and control teachers as both the groups demonstrated a decrease in friction scores from pre- to post-intervention. However, the control group demonstrated a more significant drop in friction scores. This offers a unique comparison to students' reports, whose results showed higher ratings for friction in the control group. This discrepancy may suggest that students, as mindful participants, and teachers, as mindful facilitators, experienced the mindfulness practices differently. For example, peers may be more likely to report friction with heightened awareness (i.e., mindfulness), whereas teachers may view arguments or disagreements as prosocial or collaborative if a solution was established. These differences reflect a need for additional research to more accurately isolate unique distinctions between teacher and student perceptions of classroom climate.

Although both intervention and control groups yielded an increase in cohesion, the intervention group demonstrated significantly higher scores. It is important to note, teachers participating in the intervention initially began the intervention with higher cohesion scores. It is possible, then, that facilitation of a mindfulness program helped maintain this level of cohesion. Similar to friction, these results offer a useful comparison to student reports, which yielded a decrease in cohesion for both intervention and control groups. The need remains for a more accurate distinction between teacher and student perceptions of inter-related classroom factors.

Non-significant findings were determined for the remaining teacher-rated classroom climate scales, including difficulty, satisfaction, and competition. However, the high average scores provided across subscales, particularly within intervention classrooms, suggest that teachers reported their students were relatively satisfied with their learning experience and students had positive peer relationships, as defined by classroom cohesion. These higher scores suggest it would be difficult to detect teacher changes or improvements, given that pre-test answers were generally positive. It is also important to note the climate scales represent teachers' perceptions of student experiences. While there are studies that assessed mindfulness and constructs related to classroom climate (e.g., motivation to build a supportive classroom), the metrics are more directly related to teacher experience. For example, Jennings et al. (2011b) highlighted the utility of the CARE program, which includes a multi-day compassion-based training for teachers, where mindfulness training is a component. Initial results from their study suggested teacher-reported improvements in mindfulness, well-being, and motivation to build a supportive classroom. Further, several studies have indicated that by integrating mindfulness practices into the classroom setting, teachers may experience a renewed connection to the classroom and observe improvements in their relationships with students (Flook et al. 2013; Meiklejohn et al. 2012). Flook et al. (2013) identified a significant relationship between teachers' mindfulness practices and reductions in burnout, as well as increases in self-compassion. It stands to reason then, that improvements in teachers' psychological well-being may influence their relationships with students and contribute to a stronger classroom climate. Additional research is needed to evaluate teachers' perceptions of classroom climate, with specific consideration of student factors observed by the teacher (e.g., competition, satisfaction) that may not have been accurately assessed in the current study.

The current study did not yield a relationship between leading mindfulness excercises and teacher perceptions of their own mindfulness. While a number of current study limitations should be considered, it is important to note that facilitation of an exercise may not equate to experience, and thus may not result in subsequent changes in outcome variables (e.g., levels of mindfulness). Training teachers to lead each mindfulness activity was preferred over using a recording or having an outside facilitator lead the exercises, as the teacher's delivery of the mindful moment and role as a leader in the class may have positively influenced perceptions of classroom climate. Given teachers' limited experience with mindful practices, all seven teachers were encouraged to utilize the training script early in the intervention to facilitate each exercise while simultaneously integrating mindfulness exercises into their daily routines. This would allow teachers to internalize the practice themselves, begin to experience the benefits of practice, and ultimately rely less on the script. Further research is needed to discriminate between the use of a script and strictly leading students in an exercise that has been practiced with frequency.

Limitations and Future Research Directions

This pilot study presents several limitations. First, this study was comprised of a predominantly White and Hispanic/Latino teacher and student sample. It may, therefore, have limited generalizability to other student groups. Second, this study included self-report measures of perceived mindfulness and classroom climate; however, more objective measures, such as direct observations of academic engagement and peer socialization could expand the assessment and understanding of mindfulness skills in the classroom setting.

Next, it is important to note that intervention teachers self-reported implementing the intervention with approximately 68% fidelity. As discussed by Durlak and DuPre (2008), "positive results have often been obtained with levels around 60%; few studies have attained levels greater than 80%. No study has documented 100% implementation for all providers" (p. 331). While the current study exceeded Durlak and DuPre's 60% estimate, it is important to consider the frequency of the intervention (three times per day, 2–3 min per moment in the current study) and dose-response as a prerequisite for change. Future research might consider posting mindfulness prompts in the room (Dariotis et al. 2017), or recruiting a student helper in the classroom to initiate and document all mindful moments as a classroom duty, thereby improving intervention fidelity and integrity.

Fourth, the current study aimed to complete the intervention within a 10-week period, assessing outcomes at pre-intervention (i.e., the week before implementation) and post-intervention (i.e., the last day of intervention). This study did not conduct a follow-up assessment weeks or months after the intervention concluded to evaluate the maintenance of any gains. As previous meta-analytic work found small treatment effects at follow-up in 12 pre-post studies (Klingbeil et al. 2017), future studies should consider longitudinal research to evaluate short- and long-term outcomes.

Finally, this pilot study used a quasi-experimental design with counterbalancing across two sites. The study sought to examine the impact of mindfulness on classroom climate, encouraging teachers to present the intervention in a structured sequence to begin, and then allow students to self-select the interventions to increase buy-in (Protheroe 2007; Tomlinson 2005). Given the implementation of an original intervention targeting feasibility, threats to internal validity may have influenced the outcomes. Efforts were made to minimize these effects (e.g., matched pairs design, delayed start to allow for maturation of classroom climate); however, strategies designed to increase student engagement, such as allowing students to select mindfulness activities, may have threatened study validity. Future research may wish to examine which exercises were most popular among students and examine the impact of these select interventions. The literature describing the value of a social-emotional learning-driven curricula is robust. Indeed, extant literature highlights the benefits of integrating regular mindfulness exercises in the classroom, for students (e.g., Beauchemin et al. 2008; Black et al. 2008; Burke 2009; Semple et al. 2009; Schonert-Reichl and Lawlor 2010), and teachers (e.g., Flook et al. 2013; The Garrison Institute 2007; Hakanen et al. 2006). While positive changes in satisfaction and reading fluency (among students) and cohesion (among teachers) were evident in the current study and may suggest that a few minutes of mindfulness practices a day may positively influence perceptions of classroom climate by students and teachers alike, additional school-based research is needed to examine the utility of a brief, practical intervention that will coalesce well with a busy classroom routine.

Roeser et al. (2012) briefly discuss the dose-response needed for mindfulness exercises—how much mindfulness training is feasible and efficacious to yield results for teachers, students, and classrooms. The authors of various teacher education programs (e.g., SMART in Education, Impact Foundation 2007; CARE for Teachers, The Garrison Institute 2007) have experimented with lengths (hours) and time periods (5–8 weeks) for mindfulness training, which have demonstrated improvements across academic and behavioral domains (e.g., Jennings et al. 2011a; Roeser et al. 2013). Nonetheless, "Mindfulness training programs often require a significant time commitment from teachers who already have hectic work lives" (p.171). Klatt et al. (2008) sought to examine the feasibility of a shortened MBSR program and its corresponding effects, determining that a brief MBSR program (6 weeks, 60-min per week) was linked to significant improvements in perceived stress and mindfulness. Earlier literature has examined a similar question among adults. Carmody and Baer (2009) describe a traditional 26-h commitment to MBSR training including one all-day training experience. "If lower program time demands can lead to similar outcomes in psychological functioning, it would support their utility in these settings and might lead to greater participation" (p. 627). This analysis revealed that abbreviated versions of MBSR were no less effective in decreased psychological distress than the standard MBSR programming, suggesting that shortened mindfulness practices may lead to positive outcomes. This exploratory study demonstrated variable results; further study regarding the dose-response is warranted, particularly in the context of financial feasibility and impact on instructional time (Maynard et al. 2017).

In 2017, CASEL released a revised framework for SEL programming, highlighting the ecological nature of the framework for systemic social and emotional learning. The revised model illustrates how each of the five CASEL competencies (i.e., self-management, self-awareness, social-awareness, relationship skills, responsible decision-making) are embedded in classrooms, schools, homes, and communities. This shift demonstrates the importance of collaboration among all

stakeholders, not simply those in the classroom. Given the findings of the current study, one may consider the implications for broadening the reach of mindfulness-based practices. The researcher may find it useful to evaluate training programs that involve teachers and administrators in mindful practices, systematically creating a climate of mindfulness at the school level, rather than developing and implementing an intervention within individual classrooms. Research models that integrate parent partnerships may further strengthen the framework, thereby creating a culture of mindfulness across multiple systems.

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