

University of Louisville

ThinkIR: The University of Louisville's Institutional Repository

Electronic Theses and Dissertations

5-2022

Effects of a mindfulness-based intervention on students' academic engagement, frequency of disruptive behavior, and overall mood states.

Leah Riggs
University of Louisville

Follow this and additional works at: <https://ir.library.louisville.edu/etd>



Part of the [Curriculum and Instruction Commons](#)

Recommended Citation

Riggs, Leah, "Effects of a mindfulness-based intervention on students' academic engagement, frequency of disruptive behavior, and overall mood states." (2022). *Electronic Theses and Dissertations*. Paper 3831. Retrieved from <https://ir.library.louisville.edu/etd/3831>

This Doctoral Dissertation is brought to you for free and open access by ThinkIR: The University of Louisville's Institutional Repository. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of ThinkIR: The University of Louisville's Institutional Repository. This title appears here courtesy of the author, who has retained all other copyrights. For more information, please contact thinkir@louisville.edu.

EFFECTS OF A MINDFULNESS-BASED INTERVENTION ON STUDENTS'
ACADEMIC ENGAGEMENT, FREQUENCY OF DISRUPTIVE BEHAVIOR, AND
OVERALL MOOD STATES

By

Leah Riggs

B.A., Indiana University Southeast, 2000

M.Ed., University of Kentucky, 2006

Dissertation Submitted to the Faculty of the College of Education
and Human Development of the University of Louisville
in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy in Curriculum and Instruction

Department of Special Education, Early Childhood, and Prevention Sciences

University of Louisville

Louisville, KY

May 2022

EFFECTS OF A MINDFULNESS-BASED INTERVENTION ON STUDENTS'
ACADEMIC ENGAGEMENT, FREQUENCY OF DISRUPTIVE BEHAVIOR, AND
OVERALL MOOD STATES

By

Leah Riggs
B.A., Indiana University Southeast, 2000
M.Ed., University of Kentucky, 2006

A Dissertation Approved On

April 1, 2022

By the following Dissertation Committee:

Dissertation Director
Timothy Landrum

Lauren Collins

Samantha Walte

Todd Whitney

DEDICATION

This dissertation is dedicated to my bub, for believing in me when I didn't believe in myself, and for always encouraging me to keep moving forward.

To my partner, for creating the solid foundation that supported me while I reached higher than I ever thought possible.

To my family, for being my loudest cheerleaders and helping me keep everything in perspective.

And to Picasso. Thanks for not biting me bud.

ACKNOWLEDGEMENTS

I would like to thank my advisor and Dissertation Committee Chair, Dr. Timothy Landrum, for his guidance, support, and encouragement. I would also like to thank the other committee members, Dr. Lauren Collins, Dr. Samantha Walte, and Dr. Todd Whitney, for their valuable insight during the defense process. Finally, many thanks to Professor Scott Patton for his incredible support and encouragement throughout my program.

ABSTRACT

EFFECTS OF A MINDFULNESS-BASED INTERVENTION ON STUDENTS' ACADEMIC ENGAGEMENT, FREQUENCY OF DISRUPTIVE BEHAVIOR, AND OVERALL MOOD STATES

Leah Riggs

April 1, 2022

Research into the prevalence of childhood trauma indicates that adverse experiences continue to negatively impact children and youth across the country. Current research is expanding the concept of trauma to include many children's' ongoing fear and worry surrounding the COVID-19 pandemic and experiencing the death of grandparents or other family and community members due to the virus. Symptoms of trauma may manifest in the classroom as behaviors that are attention seeking, defiant, destructive, hyperactive, disruptive, or all of the above. One emerging practice for meeting the needs of children who have experienced trauma is blending classroom behavior management and academic instruction with skills that promote principles of mindfulness. The current study investigated the effects of a mindfulness-based intervention on general education students' self-reported mood states, frequency of disruptive behavior, and academic

engagement. The current study utilized a single case experimental design. Two classroom groups differed in the frequency of prompting to engage in the Core Practice. Results of this study suggests that implementing the MindUp Curriculum with increased frequency of the Core Practice as a mindfulness-based intervention is effective in increasing students' academic engagement. Results also suggest that implementing the MindUp Curriculum alone was effective in increasing students' engagement and overall mood states. Results did not suggest an impact on disruptive behavior. Continued studies of this and similar interventions that target academic engagement and student mood states are critical to improving outcomes for students.

TABLE OF CONTENTS

DEDICATION	iii
ACKNOWLEDGEMENTS.....	iv
ABSTRACT	v
LIST OF TABLES	x
LIST OF FIGURES.....	xi
CHAPTER 1 INTRODUCTION.....	1
Background.....	1
Purpose of the Study	7
Significance of the Study.....	8
Theoretical Framework	9
Research Questions	10
Abbreviations and Definitions.....	10
CHAPTER 2 REVIEW OF THE LITERATURE	12
MBI in Schools.....	12
The MindUp Curriculum	15
<i>Program Overview</i>	15
<i>General Review of Literature</i>	19
<i>Focused Review of Literature</i>	23
CHAPTER 3 METHOD.....	29
Participants.....	30
<i>Recruitment</i>	30

<i>Inclusion/Exclusion Criteria</i>	31
<i>Setting and Demographics</i>	31
Measures.....	32
<i>Intervention</i>	32
<i>Instruments</i>	33
Study Design	36
<i>Teacher Training</i>	38
<i>Behavior Observations</i>	38
<i>Treatment Integrity</i>	40
<i>Implementation Fidelity</i>	40
Procedures	41
<i>Ethical Considerations</i>	41
<i>Implementation</i>	41
<i>Baseline Assessment</i>	42
<i>Intervention Assessment</i>	43
Materials	43
<i>MindUp Curriculum</i>	43
<i>5-Point Visual Analog Scale</i>	44
Analysis of Data	44
CHAPTER 4 RESULTS.....	45
Pre-implementation Characteristics.....	45
Impact of the Intervention on Academic Engagement	46
Impact of the Intervention on Disruptive Behavior	50
Impact of the Intervention on Overall Student Mood States.....	51
Fidelity of Intervention Implementation.....	56
Teacher Ratings of the Intervention	61
CHAPTER 5 DISCUSSION	64
Study Findings	64
Limitations.....	66
Implications for Practice	70
Conclusion.....	70
REFERENCES.....	72

LIST OF APPENDICES.....	84
CURRICULUM VITAE	96

LIST OF TABLES

TABLE	PAGE
1. Components of the MindUp Curriculum.....	17
2. Studies Examining the Potential Impacts of the MindUp Curriculum in Schools.....	21
3. Descriptive Statistics of the Study Participants.....	48
4. Visual Analysis: Academic Engagement.....	51
5. Summary Data: 5-point Visual Analog Scale.....	54
6. Visual Analysis: 5-point Visual Analog Scale.....	57
7. Implementation Fidelity.....	62
8. Descriptive Statistics: IRP-15.....	64
9. Paired-Sample t test: IRP-15.....	64

LIST OF FIGURES

FIGURE	PAGE
1. Academic Engagement.....	49
2. Frequency of Disruption.....	52
3. Mood States Over Time.....	55

CHAPTER 1 INTRODUCTION

The current study investigated the effects of a mindfulness-based intervention on the percentage of general education students engaged during instruction, the frequency of disruptive behavior, and their self-reported mood states as a class. This chapter outlines the background information and purpose of the study, paying attention to the significance and foundational theoretical framework.

Background

Although the concept of childhood trauma is not new, the extensive and continuing impacts of such trauma into adulthood were not widely recognized until publication of the Adverse Childhood Experiences (ACEs) study (Felitti et al., 1998). In this study, researchers at the CDC-Kaiser Permanente Health Maintenance Organization (HMO), a large provider of health insurance, noticed a number of participants dropping out of a weight loss study. In an attempt to understand participant attrition, a questionnaire examining the participants' current level of general health and related behaviors, as well as their past experiences in childhood was administered to over 13,000 predominantly White, college educated, and currently employed members of the HMO. The ACEs reported were separated into nine categories including physical, sexual, and

emotional abuse, mental illness of a household member, problematic drinking or alcoholism of a household member, illegal street or prescription drug use by a household member, incarcerated household member, caregiver separation or divorce, and witnessing domestic violence. Of the nearly 10,000 respondents to complete the survey, more than half reported experiencing at least one ACE, and 25% reported two or more. The number of ACEs was compared to the participants' current health status and results indicated that as the number of ACEs experienced increased, so did the likelihood of increased health risks in adulthood such as alcoholism, depression, heart disease, and suicide. Results of this study also indicated for the first time that exposure to childhood trauma was not limited to children and youth who were racially or ethnically diverse, living in poverty, or members of other vulnerable populations.

Since that initial investigation, continuing research into the prevalence of childhood trauma indicates that ACEs continue to negatively impact children and youth across the country. Each year, 3.5 million children are reported annually for suspected maltreatment (US Department of Health and Human Services, 2019) and the lifetime prevalence of experiencing one or more ACEs has been estimated at 61.8% (McLaughlin et al., 2014). In a national sample of youth under the age of 17, almost 17% of girls reported experiencing sexual abuse in their lifetime, while 70% of all participants reported witnessing violence (Saunders & Adams, 2014). When surveyed regarding traumatic experiences over the course of a single year, 37.3% of children and youth under the age of 17 reported experiencing physical assault and 15.2% reported abuse at the hands of

a caregiver (Finkelhor et al., 2015). Recent data show that young children are more susceptible to multiple forms of abuse, often occurring throughout middle childhood and adolescence (Grasso et al., 2016; Hillis et al., 2016). With conservative estimates indicating 10 million children are exposed to domestic violence each year (Artz et al., 2014) it is clear that a significant number of school-age children and youth are facing the impact of childhood trauma.

Current research is expanding the concept of trauma to include the ongoing fear and worry surrounding the COVID-19 pandemic and experiencing the death of grandparents or other family and community members due to the virus (Pappa et al., 2020). It has also been reported that approximately 40% of families with children under 12 have faced food insecurity since the pandemic began, exposing children to an overwhelming level of stress within the home (Bauer, 2020). This prolonged state of fear and stress, known as hypervigilance, leaves a child in a constant state of physiological arousal, which can manifest in the classroom as deficits in emotional and behavioral regulation (Brenning et al., 2012). These deficits in regulation decrease a child's ability to respond to the ever-changing demands of the classroom in ways that are both socially appropriate and flexible enough to meet the needs of the student and the situation (Ascone et al., 2020; Brenning et al., 2012; Eyuboglu, & Eyuboglu, 2020). Regulation is critical for adapting to change, forming and maintaining positive relationships, and functioning successfully in the classroom.

Symptoms of trauma that result from deficits in regulation may manifest in behaviors that are attention seeking, defiant, destructive, hyperactive, disruptive,

or all of the above (Cole et al., 2005). These trauma symptoms may look different for every student, and depend not only on the nature of the traumatic incident(s) they have experienced, but also on the frequency, duration, and intensity (NCTSN, 2020). Pre-existing risk and protective factors also influence the way students process and respond to traumatic events.

Because children do not all respond the same way to trauma, the model of support provided at school should not be “one size fits all” (Chafouleas et al., 2018). A recent and growing interest in trauma-informed care in education (Zakszeski et al., 2017), was especially influenced by the publication of the Substance Abuse Mental Health Services Administration (SAMHSA) guidelines for trauma-informed services in 2014. This foundational piece defined a trauma-informed approach as one “...that realizes the widespread impact of trauma and understands potential paths for recovery; recognizes the signs and symptoms of trauma in clients, families, staff, and others involved with the system; and responds by fully integrating knowledge about trauma into policies, procedures, and practices, and seeks to actively resist re-traumatization” (SAMHSA, 2014, pg. 13).

States have taken the Federal guidance from SAMHSA and developed their own frameworks for addressing the impact of trauma in schools. With the inclusion of trauma-informed care within the 2015 passage of Every Student Succeeds Act, and the passage of Senate Bill 1 in Kentucky (2019) schools are now required to adopt a trauma-informed approach to educating all students.

School districts within the Commonwealth of Kentucky are left to determine which trauma-informed strategies and practices they will implement.

Teachers face many challenges working with students who have been exposed to trauma. Specifically, trauma symptoms are misunderstood as willful and a child's triggers may be numerous or impossible to avoid, putting new or inexperienced teachers at risk of burn out before finding a solution (Cole et al., 2005). One emerging practice for meeting the needs of children who have experienced trauma is blending research-based classroom behavior management and academic instruction with skills that promote self-awareness, regulation, and relaxation including those that involve principles of mindfulness (see Chimiklis et al., 2018; Klingbeil et al., 2017; Kostova et al., 2019). The practice of mindfulness has existed for centuries but is only recently being incorporated into the school day. Rather than a focus on individual enlightenment, mindfulness within the classroom can be defined as a focus on regulating attention to the present moment, thoughts, emotions or bodily sensations without immediate action or judgment, for the purpose of improving outcomes by regulating behavior through intention rather than impulse (Bishop et al., 2004; Nilsson & Kazemi, 2016). Mindfulness-based interventions (MBIs) aim to teach students awareness and self-management skills that can in turn help them increase their self-regulation and improve their behavior. These interventions may be frequently implemented based on their ease of application for the classroom teacher. Many intervention protocols or curricula are available online, for little to no cost, and often without the need for in-depth or formal

training (e.g., Bluth et al., 2016; Frank et al., 2014; Peck et al., 2005). Other MBIs such as deep breathing or grounding exercises do not require any additional materials, are easily adaptable for students with different needs, and can be initiated by the student independently once they have learned the procedure (e.g., Bothe et al., 2014; Felver et al., 2017; Long et al., 2018). Learning to redirect attention in this way allows the student to engage in self-regulation strategies which promote calm decision making instead of reacting instinctively out of anger or fear.

With these factors making MBIs seemingly ideal for classroom implementation, recent reviews have examined the literature for evidence of the specific impacts of such interventions. Several recent systematic reviews focused on using MBIs to support students within a school setting reported mixed results due to multiple limitations including a frequent lack of randomized controlled trials; intervention procedures that were difficult or impossible to replicate; significant variation in the amount of training provided; and effectiveness data that relied solely on qualitative measures or teacher reports (Cheang et al., 2019; Emerson et al., 2019; Felver et al., 2016; McKeering & Hwang, 2019). Very few studies examined in these reviews included any documentation of the fidelity with which interventions were implemented, regardless of who implemented them. All of these limitations add up to a significant concern when discussing MBIs in the classroom, including a substantial lack of generalizability and treatment integrity within the existing literature. Without results that can be generalized, and without interventions that can be replicated, educators are left with very little confidence

in the potential effectiveness of any MBI for students who have been exposed to childhood trauma.

Purpose of the Study

Given the prevalence of trauma, its potentially significant impacts on children and youth, and the theoretical benefits of mindfulness as one foundation of effective interventions, there is a clear need for more high-quality research on the use of MBIs in schools. Therefore, the purpose of the current study is to examine the efficacy of a classroom-based MBI on (a) percentage of students engaged during instruction, (b) frequency of disruption, and (c) students' self-reported mood states within a general education classroom. The intervention was chosen in partnership with local school administrators based on the needs of their student population and within the parameters set by their Board of Education. Specifically, the school requested an intervention that was adaptable for grades K-5 and suitable for school-wide implementation, included lessons that would fit within a 50-minute general education class period, could be taught for the entire 36-week school year, addressed the emotional needs of students during the pandemic, and fit within the established budget.

The MindUp curriculum (Hawn Foundation, 2011) was chosen as it directly addressed the needs of the school and met the requirements from the Board of Education. This curriculum was readily available through online distributors and well within the school's budget. It included outlines and scripts for 15 weekly lessons with additional extension activities that span across all content areas. The curriculum covers topics ranging from neuroanatomy to empathy and

compassion, and includes a scripted breathing exercise known as the Core Practice. The Core Practice, a key component of the MindUp Curriculum, is designed to help students improve their focus and attention. The specific goal of this study is to investigate the potential impacts of an increase in frequency of the Core Practice on students' psychological wellbeing, academic engagement, and appropriate social behavior in the classroom.

Significance of the Study

This study will add to the growing body of work examining the effects of MBIs but will differ in several key ways from the current literature examining the MindUp program. First, this is the only single-case experimental design study to date that measures potential changes in student behavior through direct observation rather than teacher perception of student behavior as measured through rating scales. Second, existing studies have focused on older students (i.e., fourth grade or higher) or pre-K/Kindergarten. The current study will fill this gap by examining the efficacy of an MBI with students in the second grade. Finally, the current study examines one specific component of the MindUp Curriculum, the Core Practice. In one classroom (designated as the "MindUp" group), students received weekly instruction provided by the researcher using the MindUp curriculum along with one weekly opportunity to engage in the Core Practice. Students in the second classroom (designated as the "MindUp Plus" group) received the weekly instruction and Core Practice opportunity, as well as an additional layer of intervention through multiple opportunities to engage in the Core Practice as prompted by the classroom teacher throughout the week.

Theoretical Framework

Bronfenbrenner (1977) posited that investigations of human development had been so focused on scientific rigor that they lacked the relevance of naturalistic study. He suggested that to understand behavior and human development, researchers must examine the interaction of multiple natural systems that are present while maintaining structured, rigorous investigation. The current study is based on his 1977 framework of the levels, or systems, that make up child development: (a) the child's immediate environment; (b) the direct interaction between settings, events, or persons in the immediate environment; (c) the indirect influences of the environment on development; and (d) the larger sociocultural environment.

The ways these levels might shape development may be particularly highlighted by examining the current reality of education during a pandemic. Children's development is shaped by their immediate environment within the school and classroom, and the direct interactions among administrators, teachers, and peers. Indirect influences of the larger environment, such as teacher or parent opinion and decision making, further shape development and may be reflective of the larger sociocultural influences including the political or religious position of the family or mandates in place at the local, state, or national level.

The current study examines the efficacy of an MBI within the natural setting of a classroom, while taking into account the influences of the larger environments that shape instruction during a pandemic. Naturalistic observation

of student behavior may enable the understanding of the nested nature of the environment, while attention to methodological rigor will support the validity of any findings.

Research Questions

RQ1: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice increase the percentage of students engaged during instruction?

RQ2: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice decrease the frequency of disruptive student behavior during instruction?

RQ: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice impact the mood state of the classroom as a whole?

Abbreviations and Definitions

The following terms are frequently referred to throughout this document, and are prevented here for clarification.

Mindfulness-based intervention (MBI): An intervention with a focus on regulating attention to the present moment, thoughts, emotions or bodily sensations without immediate action or judgment, for the purpose of improving student outcomes by regulating behavior through intention rather than impulse (Bishop et al., 2004; Nilsson & Kazemi, 2016).

Trauma-informed care (TIC): A set of practices or beliefs which allow educators to recognize the symptoms and impact of trauma in order to establish safe learning environments that support students without re-traumatization (SAMHSA, 2014).

Social-emotional learning SEL: Refers to instruction focused on the skills students need to identify and manage emotions, develop and maintain healthy relationships, and make responsible decisions (CASEL, 2021).

Academic engagement: The percentage of students who were engaged during instruction.

Three levels of academic engagement were measured during behavior observations and were operationally defined as follows:

Engaged: may be active or passive engagement, defined as behavior that demonstrates student is participating in the assigned task, including taking notes, reading along, raising hand, completing worksheet, eyes on speaker, head up and listening, watching video/presentation, and/or leaving seat to follow directions (turn in work, get book/supplies).

Not engaged, but not disruptive: defined as behavior that demonstrates a student is not participating in assigned tasks but is not disrupting peers, including head down, quietly playing with pencil or other items, eyes wandering around the room, staring out the window, and/or paying attention to observer or peer(s).

Disruptive: defined as behavior that interrupts or distracts others from instruction, including wandering around room, singing, talking to peer(s), calling out without raising hand, tapping pen/pencil, hands or feet, making inappropriate sounds, arguing/talking back to peer or adult, and/or sharpening pencil unless given permission.

CHAPTER 2 REVIEW OF THE LITERATURE

As discussed in Chapter 1, research establishing the short- and long-term impacts of childhood trauma is well established. Less clear, however, is the efficacy of interventions that are meant to mediate its symptoms. This chapter will briefly outline the existing literature examining mindfulness-based interventions (MBIs) to determine how the current study may contribute to the growing evidence base. Additionally, this chapter will provide an overview of the MindUp Curriculum including a general and focused review of the recent literature in an effort to describe our current understanding of its potential efficacy.

MBI in Schools

Practicing mindful awareness, commonly defined as focusing attention on the present moment without judgment or action, has shown to be effective in improving psychological outcomes for youth and adults in both community and clinical settings (Keng et al., 2011). Meta-analyses reviewing potential impacts of mindfulness in children and adolescents noted that although mindfulness-based interventions were effective in reducing negative psychological symptoms such as those associated with anxiety and depression, the majority of studies were

conducted within clinical settings (Borquist et al., 2019; Kostova et al., 2019; Zoogman et al., 2014).

Systematic reviews and meta-analyses focused on the potential benefits for MBIs in school settings have reported improved cognitive performance, resilience, disruptive behavior, and socio-emotional outcomes (Klingbiel et al., 2017; Maynard et al., 2017; Zenner et al., 2014). Further examination of MBIs for students at greater risk of trauma exposure indicated that compared to control groups, students engaged in MBIs at school demonstrated improvements in externalizing and internalizing symptoms and emotion regulation, with decreases reported in perceived stress (Segal et al., 2021).

Although multiple studies included in these analyses reported positive outcomes for students, other reviews have reported mixed results regarding the potential effectiveness of MBIs (Emerson et al., 2019; Felver et al., 2016; McKeering & Hwang, 2019). These reviews attributed the variation in effectiveness to multiple factors including a lack of controlled, randomized trials, considerable variation in the amount of teacher training required when the teacher was implementing the intervention, and quantitative data that relied solely on teacher, caregiver, and student self-reports. Felver et al. discussed the lack of quantitative data, reporting that no studies reviewed to date included data regarding the actual impact of mindfulness on the frequency of disruptive classroom behavior, instead relying on surveys measuring teacher or caregiver perceptions. Very few studies examined included any documentation of the fidelity of implementation, with protocols or scripts rarely included in the

descriptions (Emerson et. al, 2019). This lack of integrity of implementation significantly limits the generalizability, replicability, and potential effectiveness of any practice. Emerson et al. noted that schools are implementing mindfulness-based interventions faster than quality research can be done to support them.

The rush to implement a practice, even a potentially effective one, without a foundation in research is problematic for several reasons. First, the recent Every Student Succeeds Act (2015), commonly referred to as ESSA, requires that schools implement evidence-based practices to improve student outcomes. Evidence based practices are the components of instruction that are supported by scientific research and result in documented, replicable improvements in student academic and behavioral achievement (Garcia & Davis, 2019). Further guidelines were established by the US Department of Education to review published studies using criteria set forth within ESSA so that educators and service providers could access evidence-based practices for implementation. Currently there are not enough methodologically rigorous and replicable studies in the literature to meet the requirements set forth by ESSA for mindfulness-based practices to be considered evidence based (McKeering & Hwang, 2019). In addition, these poor-quality studies can have a negative impact on the reported findings. Without methodological rigor, even the most effective practice may not produce positive outcomes for students.

In an effort to bridge the gap between the need for methodological rigor set forth in federal regulation and the need for effective MBIs in the classroom, the Collaborative for Academic, Social, and Emotional Learning, also known as

CASEL, began regularly reviewing programs based in principles of social-emotional learning, including those considered MBIs. Programs are reviewed against specific criteria for components of design and methodology, evaluation of student and institutional outcomes, and program implementation, and those meeting or exceeding the CASEL (2021) criteria are recommended as research-based. While the programs reviewed may not yet meet the ESSA definition of “evidence-based”, the guidelines proposed by CASEL enable educators to select effective programs that meet the needs of their students (CASEL, 2021). In the recently updated Guide for High-Quality Social and Emotional Learning Programs (CASEL, 2021) the MindUp Curriculum was given the highest designation as a SElect Program, meaning it met or exceeded all of the established criteria.

As noted in the Guide for High-Quality Social and Emotional Learning Programs (CASEL, 2021), multiple studies have been conducted examining the potential impacts of the MindUp program. The remainder of this Chapter will provide an overview of the MindUp Curriculum, including a general and focused review of recent literature in an effort to determine the current understanding of its potential efficacy.

The MindUp Curriculum

Program Overview

The MindUp Curriculum was developed in 2011 through a partnership with Scholastic and the Hawn Foundation to address the social and emotional needs of students across the United States. The program is based on four central

tenets that incorporate concepts involving neuroscience, mindful awareness, positive psychology, and social-emotional learning (SEL). The Curriculum is divided into four units with 15 total lessons (see Table 1). Instruction begins with basic neuroanatomy so students can learn about the structure and function of their brain, and the role their brain plays in their emotions. Lessons progress through various skills aimed at helping students improve their focus and attention, such as mindful listening and breathing exercises. Lessons addressing several social competencies including gratitude, kindness, and perspective taking are taught in the final unit of study. Each lesson contains scripts and directions for implementation, along with extension activities connecting the program across all content areas. For example, journal prompts are included and recommendations for children's literature are provided.

Table 1

Components of the MindUp Curriculum

Unit	Lessons	Goals
1. Getting focused	1. How our brains work	Identify and define the amygdala, hippocampus, and prefrontal cortex
	2. Mindful awareness	Define and describe the difference between mindful and unmindful thoughts, sensory input
	3. Focused awareness: The Core Practice	Understand the importance of practicing focusing exercises daily, and learn an exercise that combines listening and breathing, neurons and dendrites
2. Sharpening your senses	4. Mindful listening	Learn how mindful listening skills aid communication, and train attention on specific sounds, reticular activating system (RAS)
	5. Mindful seeing	Practice focusing attention on an object, and increase visual vocabulary by describing details
	6. Mindful smelling	Focus attention through sense of smell, and identify thoughts and feelings triggered by various scents
	7. Mindful tasting	Focus attention on savoring a morsel of food, and identify ways that mindful tasting can help them eat more healthily
	8. Mindful movement I	Focus attention on internal physical sensations, and monitor heart rate and exercise control over breathing
	9. Mindful movement II	Control balance and describe sensations experienced
3. It's all about attitude	10. Perspective taking	Identify different perspectives of characters in a story, and apply open-minded perspective taking to social situations
	11. Choosing optimism	Define two different mind-sets used to think about, react to, and approach a problem, and practice strategies to develop and maintain optimism

Table 1
(Continued)

Unit	Lessons	Goals
4. Taking action mindfully	12. Appreciating happy experiences	Visualize and describe thoughts, feelings, and physical sensations during a pleasurable experience as a way to build optimism
	13. Expressing gratitude	Learn the meaning of gratitude, the importance of expressing gratitude, and identify things for which we are grateful
	14. Performing acts of kindness	Find three opportunities to show kindness and perform three acts of kindness
	15. Taking mindful action in the world	Work cooperatively to plan and perform an act of kindness for the school or community

The program is divided into three manuals for grades PreK-Kindergarten through second grade, third grade through fifth, and sixth grade through eighth. The published manuals are available through online retailers for \$35-\$40. Specific training is not required to implement the program, although there are free and paid training opportunities available online. The protocol for implementation in the manual recommends that lessons should range from 30-60 minutes, be taught in sequential order, and occur at least once per week.

Students are introduced to the Core Practice in Lesson 3, which is a scripted breathing exercise designed to help students redirect attention by listening to a tone or chime while focusing on their breathing (Hawn, 2011). The Core Practice is a recommended part of each subsequent lesson, and although not specified, it is advised in the manual that multiple repetitions of the Core Practice throughout the day may be beneficial for promoting academic and behavioral success.

General Review of Literature

Since its development in 2011, several studies (N = 12) examined the potential impact of the MindUp Curriculum on various student and teacher outcomes in schools (see Table 2). The majority of studies (n = 7) focused on student participants in grades 4-7. Other studies reported participants in grades PreK-Kindergarten (n = 3), and high school (n = 1). One study did not utilize student participants and instead examined potential impacts of teaching the MindUp Curriculum on teachers' self-reports of job satisfaction and burnout (Kim et al., 2021). Studies have primarily been conducted in the United States (n = 9) with

one study each conducted in British Columbia, Portugal, and Uganda. The primary population of interest has been general education students ($n = 10$) with only two studies reporting outcome measures for students served within special education classes. The results reported were mixed, with only one study reporting statistically significant outcomes for all measures. The majority ($n = 9$) reported results that supported the hypotheses (i.e., increased prosocial behaviors or decreased negative affect within or across groups) but were not all statistically significant. One study reported such a large variability in scores across individual raters that the overall effect of the intervention was difficult to assess (Henley, 2017) and one study reported decreases in prosocial behaviors which indicated a counter-therapeutic effect and resulted in the participant being withdrawn from the study (Hang et al., 2021).

The following section provides a more focused review of eight specific studies (identified in Table 2) based on their alignment with the current study.

Table 2

Studies Examining the Potential Impacts of the MindUp Curriculum in Schools

Author(s), Date	Study Design	Measures	Main Outcomes	Participants/Setting
Carvalho et al., 2017 ^a	Quasi-experimental	Teacher ratings of student behavior, student self-ratings	Treatment > control: Increased positive affect, emotion regulation, decreased negative affect	N=454, 3 rd and 4 th grade, public schools district, Portugal
Crooks et al., 2020 ^a	Quasi-experimental	Teacher ratings of student behaviors, executive function	Treatment > control: Decreased behavioral symptoms, increased adaptive skills	N=584, Kindergarten, private school district, Canada
Francis, 2014 ^a	Pre/post	Student self-ratings of self-concept and mindful awareness	Treatment > control: Increase in mindful awareness, self-confidence	N=14, high school, public school, British Columbia
21 Hang et al., 2021 ^a	Single case (A-B)	Direct behavior observations of on-task and off-task behaviors	High variability, trends appeared to be in anticipated directions	N=11, 5 th grade, public school
Harpin et al., 2016 ^a	Quasi-experimental	Teacher ratings of student behavior, emotion regulation, student self-ratings of mindful awareness	Treatment > control: Increases in every category of social competency	N=30, 4 th grade, public school
Henley, 2017	Single case (A-B-A)	Parent, teacher, and social worker ratings of student social skills, problem behaviors, and academic competency	Increased social skills, decreased problem behavior, no difference in academic competency	N=1, 4 th grade, IEP

Table 2
Continued

Author(s), Date	Study Design	Measures	Main Outcomes	Participants/Setting
Kim et al., 2021	Pre/post	Teacher self-ratings of burnout and trauma-informed attitudes	Treatment > control: increased self-efficacy, decreased burnout	N=112, Kindergarten-3 rd grade teachers
Kulick, 2019	Quasi-experimental	Teacher ratings of student executive function, basic literacy skills	Treatment > control: increased executive function	N=89, Kindergarten, rural public school
Maloney, 2015 ^a	Mixed methods	Student ratings of intervention effectiveness and satisfaction	Majority reported enjoying the program and learning something new	N=189, 4 th -7 th grades, public district, Canada
Matsuba et al., 2020 ^a	Quasi-experimental	Student self-ratings of depressive symptoms, empathetic concern	Treatment > control: Decreased depressive symptoms, increased empathetic concern	N=168, 5 th -6 th grade, post-conflict Northern Uganda
Schonert-Reichl et al., 2015 ^a	Randomized controlled trial	Student self-ratings of prosocial behavior, executive function, salivary cortisol	Treatment > control: Increased prosocial behavior, executive function, decreased salivary cortisol	N=99, 4 th -5 th grades, public district, Canada
Thierry et al., 2016	Quasi-experimental	Teacher ratings of student executive function, receptive vocabulary, reading skills	Treatment > control: Increased executive function, no difference in reading	N=47, PreK-K, urban public school

Note. ^a denotes study is included in focused review of literature

Focused Review of Literature

Studies conducted in private school settings. Currently only one published study examined the effects of MindUp within a private school setting. Crooks and colleagues (2020) reported on implementation of the program in all Kindergarten classrooms within a private Catholic district in Canada. There were 23 treatment classrooms and 19 control classrooms, with 584 total student participants (treatment $n = 261$, control $n = 323$). This study utilized a quasi-experimental design, where designation into treatment or control conditions was not randomized. The students in the control classrooms received instruction as usual while the teachers in the treatment classrooms were instructed to implement the MindUp Curriculum over the course of the school year. Implementation fidelity was assessed using lesson tracking sheets in which the teachers in the treatment classrooms documented the date, lesson taught, length of lesson, and additional curricular activities completed. Unlike the current study, the outcomes measured in this study only included teacher ratings of student behaviors. Teachers in both treatment and control classrooms completed the Behavior Assessment System for Children, 3rd Edition (BASC-3) and the Behavior Rating Inventory of Executive Function, Preschool or Child Version (BRIEF-P or BRIEF-2) online at two time points (pre-and post-intervention) rating the frequency of internalized or externalized behaviors (i.e., hyperactivity, aggression) and aspects of executive function (i.e., working memory, emotional control).

Data analysis consisted of descriptive statistics (means and standard deviations) for continuous variables and absolute and relative frequencies for

categorical variables. Independent t-tests were conducted to compare the study outcomes between the two groups. Changes in the scores over one-time follow up were compared using a paired t-test.

The authors reported that 93% of teachers in the treatment classrooms implemented all 15 lessons. Teachers reported spending an average of 43 minutes per lesson and indicated that multiple additional curricular components were completed. The dosage (amount of time) and duration (number of weeks across which intervention was implemented) varied, but the authors reported this was appropriate given the constraints of the environment. Additional results indicated significant reductions in internalizing and externalizing behaviors in the treatment group compared to the control group. The behavior symptom index was also significantly reduced in the treatment group while adaptive skills were significantly increased. All results supported the authors' hypotheses and indicated statistically significant differences between the treatment and control groups post-intervention.

Studies using direct behavior observations. In 2021, Hang Hai and colleagues examined the potential impacts of the MindUp Curriculum on classroom conduct of students with challenging behaviors. To date, this is the only published study utilizing direct behavior observations to measure student outcomes. This pilot study investigated two hypotheses: 1) students will demonstrate increased positive classroom behaviors (including active and passive on task behaviors) and 2) students will demonstrate decreased negative behaviors (including disruptive off task and non-disruptive off task). For this

study, two fifth grade teachers in a public school in the Southwestern United States were recruited and asked to identify 5-10 students in each class who demonstrated challenging behaviors. Fourteen students were identified, and caregiver consent was obtained for eleven. Similar to the current study, all students in both classrooms received instruction using the MindUp Curriculum and data were collected through direct behavior observations. Data were only collected from the students with consent (N = 11) and were analyzed as a single case A-B withdrawal design. Baseline data were collected for three weeks prior to implementing the intervention, the program was implemented over the course of 15 weeks, and three weeks of follow-up data collection immediately followed completion of the lessons. Similar to the current study, behavior observations took place twice per week in each classroom across all phases, weather and schedules permitting. In total, there were six observations each during baseline and follow-up, and 29 observations during the intervention. Unlike the current study which calculated the percentage of students engaged during instruction and the frequency of disruptive behavior, observers in this study utilized a single item rating scale to measure active and passive engagement (on-task behaviors) along with disruptive and non-disruptive off-task behaviors. For this method, trained observers rated participants on the proportion of time that a behavior was observed during the session. As an example, the authors reported that “if a rater observed that a subject demonstrated positive classroom behaviors during two-thirds of the entire observation session, the rater would indicate 66%” for that participant (Hang et al., 2021, p. 3). Therefore, the results are estimates of the

frequency with which participants engaged in each type of behavior. The final rating for each participant was calculated by averaging the rating from two independent observers.

Data analysis included visual inspection, percentage of non-overlapping data (PND) and multi-level analyses. The authors reported that visual analysis of the data did not indicate apparent trends due to high variability within and across participants. The authors further reported that less than 25% of the data analyzed met stability criteria, which states that at least 80% of data must lie within an acceptable range of variability. Improvement was described as an increase in active or passive on-task behaviors and a decrease in disruptive or non-disruptive off-task behaviors. In general, the authors reported that both passive on-task and non-disruptive off-task trends appeared to be in the anticipated directions. Contrary to the hypothesis however, active on-task behavior data decreased for the majority of the participants ($n = 10$) during the intervention and follow-up phases. Disruptive off-task behavior appeared to decrease for some participants ($n = 4$) during intervention, but other participants ($n = 5$) demonstrated increased disruptive off-task behaviors during this phase.

Following visual analysis, the authors conducted multi-level analysis with restricted maximum likelihood to assess any potentially statistically significant differences between phases. The results were consistent with the visual analysis and indicated that passive on-task behaviors were significantly higher and non-disruptive off-task behaviors were significantly lower during intervention and follow-up when compared to baseline. The analysis also showed that active on-

task behaviors were significantly lower during intervention and follow up, and that the difference in disruptive off-task behaviors was not statistically significant.

Studies using student self-reported outcome measures. To date, only six published studies have measured the impact of the MindUp Curriculum on student outcomes using student self-reports rather than teacher ratings of perceived student behavior (see Table 2). Within these six studies, 14 different instruments have been used to score how students rated themselves on a variety of outcomes. Most frequently, these studies examined student's self-reported scores pre-and post-intervention related to their dispositional mindfulness, self-concept, internalizing and externalizing behavioral symptoms, and empathetic concern. Unlike the current study, there are no published studies to date reporting potential changes in students' self-reported mood states over time using visual analog scales. However, one study measured outcomes related to personal affect before and after implementing the MindUp Curriculum.

In 2017, Carvalho and colleagues utilized pre-and post-intervention measures of positive and negative affect by asking third and fourth grade students to complete a rating scale indicating how often they felt a certain way. The students (N = 454) attended 12 schools within a public district in Portugal. Students in the treatment group (n = 223) received instruction using a translated version of the MindUp Curriculum over the course of the school year. The full program, along with the additional cross-curriculum activities, were adapted through a collaborative effort between the Hawn Foundation, classroom

teachers, and linguists. Teachers implementing the MindUp Curriculum received 50 total hours of training over six sessions. This is 12.5 hours longer than the training offered by the Hawn Foundation, but the author's felt it was necessary due to the introduction of so many new concepts and additional practice time needed. The authors reported statistically significant increases in the pre-post scores for positive affect within the treatment group as well as in comparison to the control group. Additional data analysis indicated students in the treatment group also demonstrated statistically significant decreases in negative affect when compared with students in the control group.

Given the need for high-quality studies examining MBIs in schools, and the concerns noted in this chapter, the current study aims to complement and extend the literature on the MindUp Curriculum in the following ways: (a) utilizing direct behavior observations to examine potential changes in classroom behavior, (b) assessing students' self-reported mood states through a visual analog scale, and (c) employing a single case experimental design with general education second grade students in a private school. The following chapter will examine the study design and intervention procedures in greater detail.

CHAPTER 3 METHOD

The current study utilized single case experimental design. As noted previously, the Mind-Up curriculum was introduced to all students enrolled at a private school during the 2021-2022 school year. In order to study specific effects of one element of this curriculum– the frequency of use of the Core Practice (a scripted breathing technique)- two classrooms at one grade level were assessed for behavior changes.

In one classroom (designated as the “MindUp” group), students received weekly instruction provided by the researcher using the MindUp curriculum, including one weekly opportunity to engage in the Core Practice. Students in the second classroom (designated as the “MindUp Plus” group) received the weekly instruction and Core Practice opportunity with the researcher, as well as an additional layer of intervention through multiple opportunities to engage in the Core Practice as prompted by the classroom teacher throughout the week.

In this chapter, the methods used to assess the differential effects of this additional treatment layer on academic engagement, frequency of disruptive behavior, and self-reported mood state are discussed.

To reiterate, the research questions addressed were:

RQ1: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice increase the percentage of students engaged during instruction?

RQ2: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice decrease the frequency of disruptive student behavior during instruction?

RQ: Utilizing the MindUp Curriculum, does an increase in the frequency of the Core Practice impact the mood state of the classroom as a whole?

Participants

Recruitment

Administrators of a private K-8 school in central Kentucky made the decision to include Social Skills instruction in the Arts and Humanities rotation for all students in grades K-5 for the 2021- 2022 school year. The researcher was approached by the principal to lead the instruction. Caregivers and students were introduced to the Social Skills class and MindUp curriculum through an open house, and letters sent home prior to the start of school regarding the school's implementation of this curriculum.

Information regarding the nature and purpose of the study was presented to school staff during a summer planning meeting. Each grade level consisted of two general education classes with two classroom teachers and a shared assistant. The first teacher to volunteer to participate within a grade was designated as the MindUp Plus group, while the second classroom was designated as the MindUp group. For the current study, data were only collected on classes in the second grade.

Informed caregiver consent for participation in the study was solicited through letters sent home and via email correspondence. Of the 34 students enrolled in the second grade, caregiver consent was obtained for 31 students (MindUp Plus, n = 16, MindUp, n = 15). All 34 students participated in the MindUp curriculum and activities during the weekly Social Skills class conducted by the researcher, but those without caregiver consent were not included for data collection during behavior observations or given the 5-point scales.

Student assent was solicited through discussions with the researcher as outlined in the IRB protocol. The nature and purpose of the study was explained and students were given the opportunity to ask questions. Students were reassured frequently that their participation was voluntary, anonymous, and that they could change their mind at any time.

Inclusion/Exclusion Criteria

All students currently enrolled in the second grade were invited to participate in the study. Behavior observation and self-report data were only collected for students whose caregivers provided consent. There were no exclusion criteria for participation in the study.

Setting and Demographics

The study was conducted at a small private school located in central Kentucky. A total of 404 students were enrolled for the 2021-2022 school year in grades preK-8. Ethnicity reported was 94% White, 3% two or more races, 2% Hispanic, 1% Asian, and 1% Black. 48% of the student population were female and 52% were male. Although a high prevalence of ACES was not immediately

apparent, anecdotal reports from teachers, administrators, and students indicated the presence of trauma and mental health concerns related to the pandemic as well as other factors.

All participants were currently receiving instruction within two general education second grade classrooms. Caregiver consent was sought for all 34 enrolled students through letters sent home and via email. Consent was obtained for 31 total students. The MindUp Plus group (n = 16) included six females, with seven females in the MindUp group (n = 15). All participating students were White and between the ages of 7 to 8 years old. Two classroom teachers participated in the study. Both teachers were White females with 15 years (MindUp Plus) and 16 years (MindUp) of teaching experience and had obtained master's degrees in Elementary Education prior to implementation.

Measures

Intervention

As discussed previously, the MindUp Curriculum was developed by the Hawn Foundation (2011) in collaboration with Scholastic to address the social and emotional needs of students. It was specifically designed for classroom-based implementation by teachers, guidance counselors, or other school staff members. The Curriculum is divided into four units with 15 lessons, and published manuals are available for grades pre-K- 2, grades 3-5, and grades 6-8. The pacing of units and lessons can be adapted based on the amount of time available and the recommended duration ranges from 30-60 minutes. Sequential lessons (see Table 1) can be taught daily, several times per week, or weekly.

Students are first introduced to neuroanatomy and mindfulness, and then learn the Core Practice in Lesson 3. The Core Practice is a scripted deep breathing exercise that prompts students to listen to a tone or chime while focusing on their breathing. The following script is provided in the MindUp manual:

"It's time for our Breathing Exercise. Make sure you're sitting comfortably, and close your eyes or look down into your hands. When you hear the sound, listen as long as you can. When the sound has faded, begin to focus on every breath as you take it in and let it out. When you hear the sound a second time, listen as long and carefully as you can, still breathing calmly. When you can't hear the sound any longer, slowly open your eyes but remain still and calm." (pg. #46)

The Core Practice is a recommended part of each subsequent lesson, and it is advised in the manual that multiple repetitions of the Core Practice throughout the day may be beneficial for promoting academic and behavioral success.

Instruments

PLA-Check. The Planned Activity Check (PLA-Check; Risley & Cataldo, 1973, 1974) was used to conduct systematic observations in the classrooms (see Appendix A). The PLA-Check is a type of momentary time sampling and allows observers to calculate the percentage of academic engagement for a whole group (Cooper, Heron, & Heward, 2007). At the beginning of the observation, the observer noted the number of students present, the location where the observation occurred, the content area and type of activity (whole group, small group, or independent work). Each observation was divided into 10 equal

intervals. A timer was set for the designated interval length (90 seconds). When the timer started the observer scanned the room slowly, counting the number of students who were on or off task and recorded the numbers on the observation sheet. When the timer vibrated after 90 seconds the interval was complete, and the observation process continued until 10 intervals were recorded.

Engagement per interval was calculated by dividing the number of students who were engaged in an interval by the total number of students present in that interval and multiplying by 100. Based on recommendations for use of the PLA-Check by Risley and Cataldo (1973, 1974), at least 80% of the students needed to be engaged in order for the interval to be counted as engaged. The number of intervals recorded as engaged was divided by the total number of intervals and multiplied by 100 to give an overall percentage of engagement for the class during the observation.

Calculating the frequency of disruptive behavior was built into the PLA-Check observation form. Tally marks are used to indicate if a student is “engaged”, “not engaged but not disruptive”, or “disruptive” during the intervals. The number of marks for “disruptive” was totaled for each interval, providing a total frequency of disruptive events during the observation period.

Reliability. Interobserver agreement (IOA) was collected by comparing observation data collected by the researcher and data collected by a second, trained observer during the same observation. A doctoral student from the University of Louisville received training using the PLA-Check until IOA was at 80%. The trained observer remained blind to the classroom conditions

throughout the study. During training, it was difficult for the researcher and observer to keep pace and ensure that they were recording the same student at exactly the same moment in order to record the same type of behavior. Several methods were attempted, including counting out loud during the intervals, but resulted in distracting the students. Ultimately, IOA was calculated by counting the number of engaged intervals per observation in agreement rather than agreement per interval. IOA was calculated for five sessions (31.2%) and was 80%.

5-point visual analog scale. The 5-point scale, or “feelings thermometer”, used in this study was similar to the visual analog scales (VAS) used in clinical settings to measure a patient’s subjective experience of a phenomenon, such as pain or mood states (Wewers & Lowe, 1990). VAS have been adapted over the years to suit implementation with children by the addition of pictures and/or colors (Shields et al., 2003; Wewers & Lowe, 1990). The VAS used in the current study was a vertical display of five mood states, delineated as 1 (green) *ready to learn*, 2 (blue) *sad*, 3 (yellow) *upset*, 4 (orange) *overwhelmed*, and 5 (red) *angry* (see Appendix B). Each level was accompanied by a black and white line drawing of a boy or girl’s face representing that emotion (Kuypers, 2011).

Reliability. VAS for mood states have shown good internal reliability, with test-retest correlations between 0.95-0.99, an interrater reliability coefficient of 0.99 (Wewers & Lowe, 1990).

Validity. Criterion-related validity of VAS compared to other clinical rating scales for the same outcome demonstrated coefficients ranging from .42-.91 (Wewers & Lowe, 1990).

IRP-15. The Intervention Rating Profile (IRP) is a 15-question Likert-scale and was used to measure the acceptability of an intervention (see Appendix C; Martens et al., 1985). The Likert scale ranges from 1 (strongly disagree) to 6 (strongly agree). Scores can range from 15 to 90, with higher scores indicating higher acceptability (Chiak et al., 2007). The acceptability indicator is calculated by multiplying the number of items (15) by 3.5, the average score for acceptability, and values greater than 52.5% indicate the presence of an acceptable intervention (Von Brock & Elliott, 1987; Chiak et al., 2007).

In the current study, wording for several questions on the IRP-15 was modified based on input from the IRB prior to implementation. For example, language in the original version asks for a teacher's opinions of the intervention with respect to a specific student (i.e., "Most teachers would find this intervention suitable for the needs of the child"). Language was modified to reflect the teacher's opinion of the intervention for the class as a whole (i.e., "Most teachers would find this intervention suitable for children with similar needs").

Reliability. The IRP-15 has demonstrated good internal consistency with Cronbach's alpha of 0.98 (Common & Lane, 2017).

Study Design

All students in grades K-5 received social skills instruction using the MindUp curriculum as directed by the school administration for the 2021-2022

school year. The lessons were taught by the study author in 50-minute sessions once per week and took place within the general education classrooms.

The current study utilized a single case experimental design with matched classrooms, which differed in the frequency of prompting to engage in the Core Practice. In one classroom (designated as the “MindUp” group), students received weekly instruction provided by the researcher using the MindUp curriculum along with the Core Practice. The researcher facilitated the Core Practice for the MindUp group during each weekly lesson by reading the script and playing the tone. The classroom teacher in this group was instructed to continue with instruction as usual throughout the week and not to initiate any breathing exercises.

For students in the second classroom (designated as the “MindUp Plus” group), weekly instruction using the MindUp Curriculum and Core Practice were provided by the researcher. Additionally, the Core Practice was prompted three times daily by the classroom teacher throughout the week for five continuous weeks. Classroom behavior data and self-reported mood states were collected on the same schedule for both groups during the baseline and intervention periods.

The MindUp Curriculum and teacher training were provided by the researcher, a doctoral candidate with 15 years of experience working in education and extensive training in the implementation of mindfulness-based interventions and school-based trauma-informed care.

Teacher Training

The MindUp Plus classroom teacher attended a 30-minute training session with the researcher prior to baseline data collection. The training included a brief overview of the MindUp curriculum, the 5-point scale, demonstration of the Core Practice, and several trials using the website. The teacher was given the opportunity to ask questions following the training. The training was considered complete when the teacher could complete all three steps for the Core Practice and use the website with 100% accuracy. Prior to beginning the intervention, the researcher and teacher met again to discuss any questions or concerns.

Behavior Observations

Observations occurred within each classroom on Tuesdays, Wednesdays, or Thursdays. Observation times varied in an effort to observe students during instruction rather than free time, Mass, or other activities in order to more accurately measure percentage of engagement. After entering the classroom, the researcher waited 3-5 minutes so the students were acclimated to her presence and to ensure that instruction was occurring. Each observation consisted of ten 90-second intervals during which the researcher marked a tally for each student to note their behavior. The researcher started with either the first student in the first row, or the last student in the last row, and marked if that student was engaged, not engaged but not disruptive, or disruptive. Engagement was either active or passive, and defined as any behavior that demonstrated a student was participating in the assigned task. These included taking notes, reading along,

raising his or her hand, completing a worksheet, eyes on speaker, head up and listening, watching video/presentation, and/or leaving his or her seat to follow directions (i.e., turn in work, get book/supplies). Not engaged, but not disruptive was defined as any behavior that demonstrated a student was not participating in assigned tasks but was not disrupting peers. These included putting his or her head down, quietly playing with pencil or other items, eyes wandering around the room, staring out the window, and/or paying attention to the observer or peer(s). Disruptive was defined as any behavior that interrupted or distracted others from instruction, including wandering around the room, singing, talking to peer(s), calling out without raising his or her hand, tapping a pen/pencil, hands or feet, making inappropriate sounds, arguing/talking back to a peer or adult, and/or sharpening pencil unless given permission.

Recordings proceeded for each student in the class, row by row, until all students had been observed. The starting student varied between observations but did not vary between intervals. A 10 second pause occurred between each of the 10 intervals. Typical observations lasted 20-30 minutes based on the class activity.

The number of students present for each interval was recorded. If the instruction was paused for a class restroom break, the observation paused and resumed when all students were back and instruction had resumed. The percentage of engagement and frequency of disruptive behavior were calculated after each completed observation.

Treatment Integrity

Treatment integrity was assessed within the research design throughout the study and supported by ongoing documentation from the researcher. The researcher maintained detailed outlines, lesson plans and post-session instructional notes for each session per group. Checklists were used to monitor implementation fidelity (see Appendix D). Examples of all work were kept with the corresponding lesson and unit outlines. Student work samples were collected and graded each quarter to ensure that lessons were completed successfully.

Implementation Fidelity

Implementation fidelity data was collected through real-time monitoring of teacher behavior via a custom-created website using on demand media with an embedded Google form (see Appendix E). The website provided the script for the Core Practice and an easily accessible “play” button so the teacher could play the same tone each time. The teacher marked each step “complete” in the embedded Google Form if the action was taken. All data captured were automatically time stamped and saved in a Google Sheet. The researcher met with the classroom teacher weekly to review the Google Sheet, troubleshoot any issues, and answer any questions.

Implementation fidelity data for the researcher was collected through the use of session checklists (see Appendix D). Components of the MindUp Curriculum for each session were marked each time as they were completed.

Procedures

Ethical Considerations

In order to maintain confidentiality and protect the identity of students and caregivers, all data was collected anonymously. No identifying information was collected from any participant other than the classroom designation based on the first letter of the teacher's last name ("2D" or "2M"), and student and caregiver names were only linked on the caregiver consent forms. During inter-observer agreement sessions, the second observer was blind to the classroom treatment conditions. All procedures, including assessment and data collection, were submitted and approved by the University of Louisville's Institutional Review Board (IRB). Following IRB approval, study procedures were submitted and approved by the Archdiocese of Louisville along with administrators at the school.

Implementation

The researcher provided instruction to all students in grades K-5 during one 50-minute Social Skills class per week for the entire school year. Lessons and activities were planned by the researcher to follow the MindUp curriculum. Instruction was provided for both MindUp Plus and MindUp groups at the same pace using the same activities. The protocol from the MindUp Curriculum manual was adapted into session checklists (see Appendix D) that the researcher used to ensure similar instruction and implementation fidelity with both groups.

Students in both MindUp Plus and MindUp groups received direct instruction in the use of the 5-point scale. The researcher led group discussions

about each of the five mood states, and students acted out different scenarios depicting each mood. Students were instructed to indicate the mood state that was most representative of what they were experiencing at that moment. Several students in each group asked if more than one choice was appropriate. The researcher acknowledged that while we do often feel multiple things at once, for this rating it would be clearer to rate the mood that the student felt the strongest. Students were instructed to place a check mark or fill in the square next to the mood state they were feeling at that time, or to leave the scale blank if they did not want to participate. Students were reminded frequently throughout the study that their ratings were anonymous and that they should not put their names on the rating scales. Students placed their rating scales in an envelope that was labeled with the date and their classroom designation only (“2M” or “2D”).

The 5-week intervention phase began with the introduction of the Core Practice in Lesson 3. During intervention, both groups continued to receive the same instruction following the MindUp curriculum provided by the researcher. The researcher led both the MindUp and MindUp Plus groups in the Core Practice during their weekly 50-minute lesson. The classroom teacher led the MindUp Plus group in the Core Practice three additional times per day for each remaining day of the week.

Baseline Assessment

The start of the baseline phase began immediately following IRB approval, and occurred the week prior to the introduction of the Core Practice (Unit 1, Lesson 3). Due to the structure of the MindUp Curriculum, baseline data

collection could not occur after Lesson 3. Therefore, the intervention phase began despite a limited number of baseline data points and without establishing a clear trend.

The researcher conducted three baseline observations in both MindUp Plus and MindUp groups prior to introducing the Core Practice. Baseline observations followed the same general observation procedure outlined above. The percentage of students engaged during instruction was calculated after each completed observation.

Intervention Assessment

Behavior observations were conducted two to three times per week in the MindUp Plus and MindUp classrooms throughout the 5-week intervention period. Typically, both groups were observed in one day, and the time of the observations varied week to week.

Materials

MindUp Curriculum

The kindergarten-second grade version of the published manual of the MindUp Curriculum (Hawn Foundation, 2011) was used throughout the study. An electronic tone was downloaded and embedded into a custom-created website for researcher and teacher access during the breathing exercises. Additional extension activities as suggested in the MindUp manual were created by the researcher (available upon request).

5-Point Visual Analog Scale

The 5-point scale used to assess students' self-reported mood states was created by the researcher using a template and images from the Zones of Regulation program (Kuypers, 2011). Scales measured 2"x3" and were printed on plain white paper.

Analysis of Data

Descriptive statistics for demographic information including mean and standard deviation were calculated for both MindUp Plus and MindUp groups at baseline. Visual analysis along with within-and between-phase analysis (including level, stability, and percentage of non-overlapping data) were calculated for percentage of academic engagement, frequency of disruptive behavior, and overall mood state. The percentage of non-overlapping data (PND) is a common method to examine the outcome level's change in different phases and was used in the current study for comparison with the changes in behavior reported by Hang Hai and Colleagues (2021). Implementation fidelity was examined by calculating the percentages of dosage, frequency, adherence to protocol, and reporting for both the teacher in the MindUp Plus group and the researcher. Social validity, as measured through teacher ratings of the acceptability of the intervention, was analyzed using paired-sample t test for potential statistical significance.

CHAPTER 4 RESULTS

In order to study specific effects of one element of the MindUp curriculum—the frequency of use of the Core Practice (a scripted breathing technique)- two classrooms at one grade level were assessed for behavior changes. Direct behavior observations were used to calculate the percentage of students engaged during instruction along with the frequency of disruptive behavior. Students completed anonymous 5-point visual analog scales throughout the intervention phase to indicate their current mood. The results are presented in this chapter, followed by the discussion.

Pre-implementation Characteristics

The characteristics of the student participants and the classroom teachers are presented in Table 3. There were 34 total enrolled students, divided equally between the two classrooms. The study sample consisted of 31 students, with 51.6% and 48.4% in the MindUp Plus and MindUp groups, respectively. Of the overall sample, more than half (58.1%) were boys, with 62.5% and 53.3% in the MindUp Plus and MindUp groups, respectively. The mean (SD) age for the entire sample was 7.69 (.51) years old, with 7.70 (.42) and 7.68 (.59) years old in the MindUp Plus and MindUp groups, respectively. 100% of the entire student and

teacher participants were White. The mean (SD) years of teaching experience was 15.5 (.70), with 15 years and 16 years for the teachers in the MindUp Plus and MindUp classrooms, respectively. Both teachers had obtained master's degrees in Elementary Education prior to implementation.

Impact of the Intervention on Academic Engagement

Academic engagement was calculated as a percentage of students who were engaged during each observation. Each observation was divided into 10 equal intervals. A timer was set for the designated interval length (90 seconds). When the timer started the observer scanned the room slowly, counting the number of students who were on or off task and recording the numbers on the observation sheet. When the timer went off the interval was complete, and the observation process continued until 10 intervals were recorded.

Table 3

Descriptive Statistics of the Study Participants

Variables	Entire Sample	Study Groups	
		MindUp Plus Group	MindUp Group
N	31 (100) ^a	16 (51.6)	15 (48.4)
Student-level characteristics			
Gender			
Boys	18 (58.1)	10 (62.5)	8 (53.3)
Girls	13 (42)	6 (37.5)	7 (46.6)
Age (years), mean [SD]	7.69 [.51]	7.70 [.42]	7.68 [.59]
Ethnicity			
White	31 (100)	16 (100)	15 (100)
Non-white	0	0	0
Class-level characteristics			
Size	34 (100)	17 (50)	17 (50)
Teachers' experience (years), mean [SD]	15.5 [.70]	15	16
Ethnicity			
White	2 (100)	1 (50)	1 (50)
Non-white	0	0	0

Note. Data represent mean [standard deviation] unless stated otherwise.

^aData reported as N (%)

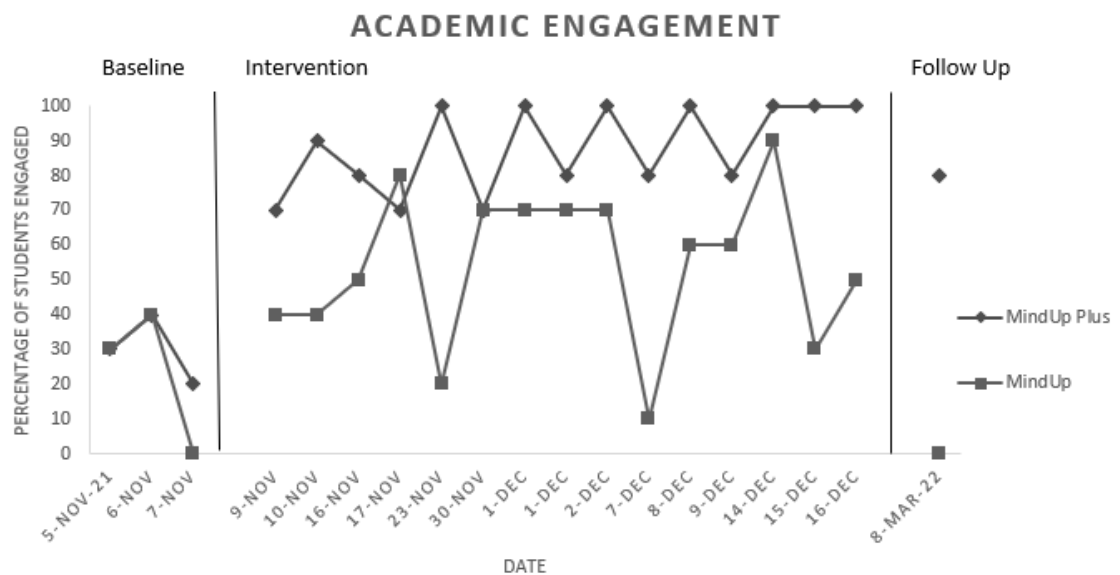
Engagement was calculated by dividing the number of students who were engaged in an interval by the total number of students present and multiplying by 100. If at least 80% of the students were engaged the interval is counted as engaged. The number of intervals recorded as engaged was divided by the total number of intervals and multiplied by 100 to give an overall percentage of engagement for the class during the observation.

Figure 1 represents baseline, intervention and follow-up data for both MindUp Plus and MindUp groups. Academic engagement in the MindUp Plus

group ranged from 20-40% per observation during baseline and initial data were beginning a downward trend. Engagement ranged from 70-100% per observation in the MindUp Plus group during the intervention. Beginning in intervention week 1, engagement for the MindUp Plus group was consistently above 70% with 7 observations at 100% engagement. In the MindUp group, engagement ranged from 0-40% during baseline with initial data also beginning a downward trend. Engagement in the MindUp group ranged from 10-90% during intervention. High variability in the percentage of engagement in the MindUp group was noted throughout the intervention phase, falling as low as 10% and reaching as high as 90% engaged. The MindUp group was not observed to be 100% engaged at any time. Follow-up data were collected for both groups 11 weeks post intervention and recorded as 80% engaged in the MindUp Plus group and 0% engaged in the MindUp group.

Figure 1

Academic Engagement



Within- and between-phase analyses of the data included evaluation of the level, stability, and percentage of non-overlapping data (PND) within each phase (baseline and intervention) excluding follow-up were calculated and are presented in Table 4. The level was examined by calculating the mean percentage of academic engagement for both groups across phases (see Table 4.) The level of engagement increased from a mean of 30% during baseline to a mean of 88% during intervention in the MindUp Plus group, and from a mean of 23% during baseline to a mean of 54% during intervention in the MindUp group. Stability for the intervention phase was examined by calculating the number of data points that fell within 15% of the intervention phase mean. The stability criterion was met if between 80-90% of the phase data were within 15% of the phase mean (Lobo et al., 2017). Data in the intervention phase for the MindUp Plus group reached the stability criterion with 80% of the data points were within 15% of the phase mean. Data in the intervention phase for the MindUp group did not reach the stability criterion, with only 26.6% of data points within 15% of the phase mean. Stability was not calculated for the baseline phase due to the small number of data points. The PND effect size was calculated to examine the percentage of data points in the intervention phase that exceeded the highest data point in the baseline phase for each group. A PND = <50% suggests no effect, PND = 50-70% suggests a questionable effect, and PND = >70% suggests the intervention was effective (Lobo et al., 2017). The PND for the MindUp Plus group was 100%, meaning all intervention data points exceeded the highest data point in the baseline phase and suggesting the MindUp Curriculum

with increased frequency of the Core Practice was effective. Interestingly, the PND for the MindUp group was 62.5%, meaning over half of the intervention data were above the highest data point in the baseline phase and suggesting that the MindUp Curriculum alone had a questionable effect on the percentage of academic engagement.

Table 4

Visual analysis of academic engagement across observations

Group	Level		Stability	PND
	Baseline	Intervention		
MindUp Plus	30	88	80	100
MindUp	23	54	26.6	62.5

Note. PND represents the percentage of non-overlapping data (PND) effect size statistic between baseline and intervention phases. Stability represents the percentage of data points within 15% of the mean.

Impact of the Intervention on Disruptive Behavior

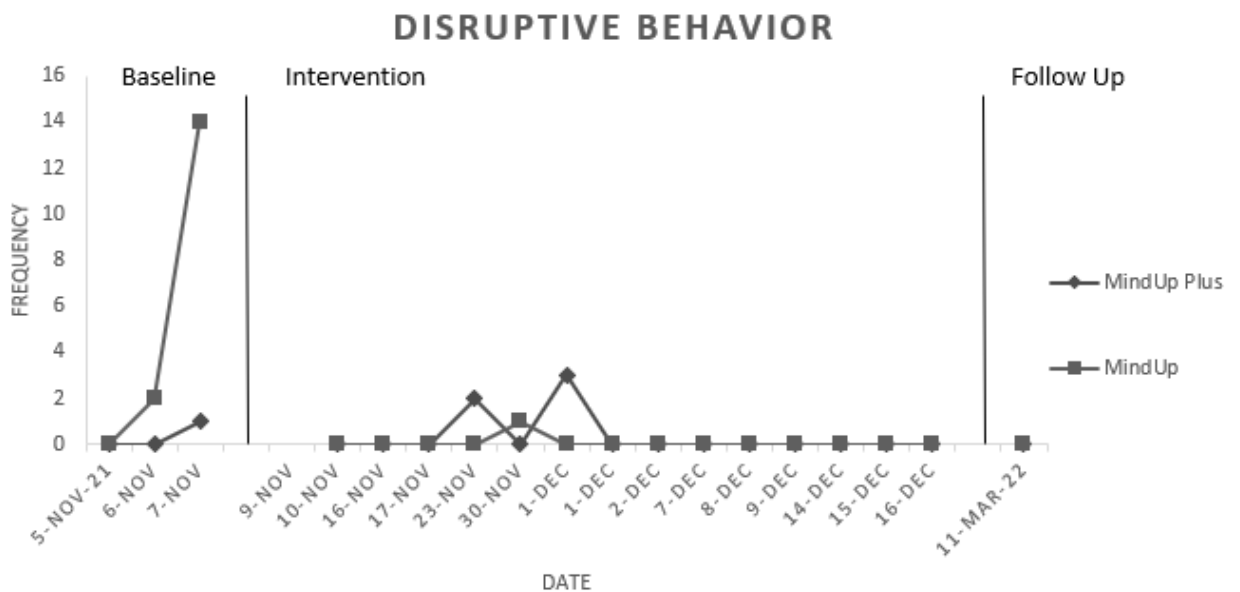
Calculating the frequency of disruptive behavior was built into the PLA-Check observation form. Tally marks were used to indicate if a student was “engaged”, “not engaged but not disruptive”, or “disruptive” during the intervals. The number of marks for “disruptive” was totaled for each interval, providing a total frequency of disruptive events during the observation period.

Figure 2 represents the frequency of disruption for both the MindUp Plus and MindUp groups during baseline, intervention, and maintenance. Overall, both groups demonstrated a low frequency of disruptive behavior, with zero instances recorded in the majority of observations. In the MindUp Plus group, there was

one instance of disruptive behavior recorded during the third baseline observation, indicating the start of an upward trend. In the MindUp group, the frequency of disruption was recorded as two instances during the second baseline observation and 14 during the third baseline observation, indicating the potential start of an upward trend. Both groups also showed a slight increase in frequency of disruption across observations 7-9, which occurred during the short week preceding the Thanksgiving holiday. Given the overall low occurrence disruptive behavior, any further visual analyses of these data were not warranted.

Figure 2

Frequency of Disruption



Impact of the Intervention on Overall Student Mood States

Students in both the MindUp Plus and MindUp groups were given a 5-point visual analog scale 19 times during the study (see Appendix B). Students were instructed to place a check mark or fill in the square next to the mood state

they were feeling most strongly at that time, or to leave the scale blank if they did not want to participate. Initial review of the scales during baseline indicated that students were either unclear or misusing the scales, with several having more than one box marked. Group instruction was repeated, and students indicated a strong preference that a combination of 1 (ready to learn) and 2 (sad) indicated they were ready to learn but also tired or dragging. The researcher agreed that students could mark 1 and 2 if this was the case, but all other categories should remain as a single mark for the mood that they felt the strongest at that time.

Summary data for the 5-point scales are presented in Table 5. Completion was examined by calculating the total number of opportunities for each group divided by the number of scales completed and multiplied by 100. Frequent absences in both groups reduced the completion rates, but the MindUp Plus group completed more of their scales (96.7%) than the MindUp group (91.9%). Scales were examined per opportunity, and the number of each mood state was totaled along with the number of students present. Multiple students in both the MindUp Plus and MindUp groups continued to mark multiple moods on the scales throughout the intervention, resulting in similar percentages of unusable data. In the MindUp Plus group, there were 27 scales that were not usable, with the most frequent being five scales that were marked as 1, 2, 3, and 4. In the MindUp group, there were 39 unusable scales, including 15 scales marked both 1 and 3, and 11 scales marked both 2 and 3. Data that were usable included scales in which a single mood state was indicated, or scales in which both 1 and 2 were marked together. No other combination of mood states was included in

the usable data. By these criteria, in total, 90.8% of the scales in the MindUp Plus group and 85.1% of the scales in the MindUp group were considered usable. Overall, both groups reported a similar percentage of mood states that included either 1 only or the combination of 1 and 2, with the MindUp Plus group slightly higher (79.9%) than the MindUp group (76.3%). Scales that were marked with a combination of both 4 and 5 were not counted in the overall usable data, but were included in the final examination in an effort to measure the percentage of students in both groups who indicated they were 4 (overwhelmed), 5 (angry), or both 4 and 5. Again, both groups reported similar percentages of mood states that included either 4, 5 or both, with the MindUp Plus group slightly lower (2.0%) than the MindUp group (3.8%).

Table 5

Summary of overall mood states reported across baseline and intervention

	MindUp Plus	MindUp
Completion	294 (96.7)	262 (91.9)
1 and 1+2	232 (79.9)	200 (76.3)
Usable scales	267 (90.8)	223 (85.1)
5 and 4+5	6 (2.0)	10 (3.8)

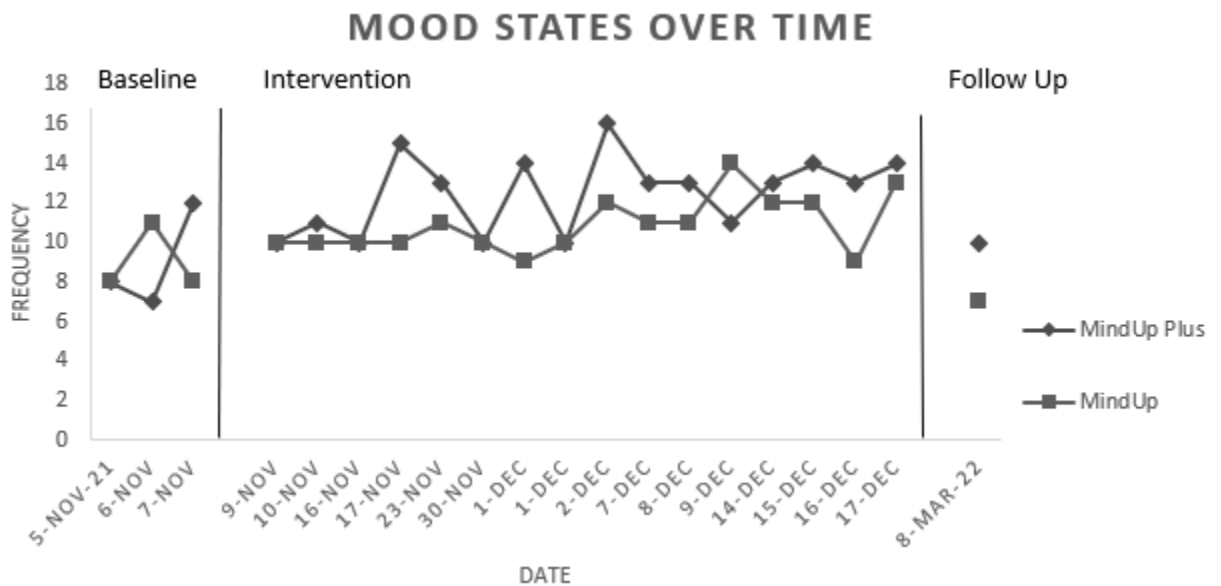
Note. All values are number (percentage)

Figure 3 represents the frequency of mood states reported over time as indicated by the number of scales that were marked as 1 only or both 1 and 2 for each opportunity. The frequency ranged from 8 to 12 in the MindUp Plus group, and initial baseline data indicated the start of an upward trend. Beginning in week

1, the frequency of scales marked as 1 or both 1 and 2 in the MindUp Plus group ranged from 10 to 16. In the MindUp group, the frequency ranged from 8 to 11 with initial baseline data indicating the start of a possible downward trend. Beginning in week 1, the frequency of scales marked as 1 or both 1 and 2 in the MindUp group ranged from 9 to 13. The frequency was inconsistent in both groups throughout the intervention. Follow-up data were collected for both groups 11 weeks post-intervention and recorded as a frequency of 10 in the MindUp Plus group and 7 in the MindUp group.

Figure 3

Frequency of scales marked as 1 only or 1 and 2



Within- and between-phase analyses of the data included evaluation of the level, stability, and percentage of non-overlapping data (PND) within each phase (baseline and intervention) excluding follow-up were calculated and are presented in Table 6. The level was examined by calculating the mean mood

state for both groups across phases (see Table 6.) Means were calculated using only the frequency of scales that were scored as 1 or both 1 and 2. The level of mood increased from a mean of 9 to a mean of 12.5 during intervention in the MindUp Plus group, and from a mean of 9 during baseline to a mean of 10.9 during intervention in the MindUp group. Stability for the intervention phase was examined by calculating the number of data points that fell within 15% of the intervention phase mean. The stability criterion was met if between 80-90% of the phase data were within 15% of the phase mean (Lobo et al., 2017). Data in the intervention phase for the MindUp Plus group did not reach the stability criterion with 62.5% of the data points within 15% of the phase mean. Data in the intervention phase for the MindUp group did reach the stability criterion, with 93.8% of data points within 15% of the phase mean. Stability was not calculated for the baseline phase due to the small number of data points. The PND effect size was calculated to examine the percentage of data points in the intervention phase that exceeded the highest data point in the baseline phase for each group. A PND = <50% suggests no effect, PND = 50-70% suggests a questionable effect, and PND = >70% suggests the intervention was effective (Lobo et al., 2017). The PND for both the MindUp Plus group (62.5%) and the MindUp group (50%) indicate that at least half of the intervention data were above the highest point in the baseline data for both groups. This suggests a questionable effect of the MindUp Curriculum with increased frequency of the Core Practice as well as the MindUp Curriculum alone on the overall mood state of students over time.

Table 6

Average percentage of mood states across observations

Group	Level		Stability	PND
	Baseline	Intervention		
MindUp Plus	9	12.5	62.5	62.5
MindUp	9	10.9	93.8	50

Note. PND represents the percentage of non-overlapping data (PND) effect size statistic between baseline and intervention phases. Stability represents the percentage of data points within 15% of the mean.

Fidelity of Intervention Implementation

Implementation fidelity was monitored for both the classroom teacher in the MindUp Plus group and the researcher. The fidelity of the classroom teacher’s implementation of the Core Practice was self-collected through the use of a custom-created website using on demand media with an embedded Google form (see Appendix E) and periodically observed by the researcher. All data from the website were timestamped and saved in a Google Sheet. Teacher implementation data were evaluated for frequency, dosage, and adherence to protocol (see Table 7). Prior to implementation, the teacher in the MindUp Plus classroom was trained by the researcher in the use of the website and the steps of the Core Practice. The teacher was instructed to utilize the website to prompt students to engage in the Core Practice three times per day, Monday through Thursday during the 5-week intervention phase. Following training, the teacher was able to demonstrate use of the website and follow the steps of the Core Practice with 100% accuracy. The teacher was observed implementing the Core

Practice during the intervention phase by the researcher on four days (20%), and demonstrated 100% adherence to protocol during the observations.

Frequency and dosage were defined as the amount of the program delivered compared to the amount prescribed by the model and are used to measure students' exposure to the treatment (Cook et al., 2015). Frequency was calculated as the number of days the Core Practice was prompted divided by the total number of days possible and multiplied by 100. There were 22 days possible (Mon.-Thurs.) during the intervention phase on which the teacher in the MindUp Plus group could prompt students to engage in the core practice. The teacher was absent on two days, resulting in 20 days (90.9%) of implementation.

Dosage was calculated as the number of times the Core Practice was prompted per day divided by the number of times prescribed and multiplied by 100. Data for dosage were calculated based on both the total possible days in the intervention phase (22 days) as well as the actual number of days available (20 days) due to teacher absences. The teacher was instructed to prompt the use of the Core Practice three times per day over the course of the 22-day intervention phase, resulting in 66 total prompting opportunities. The teacher provided 32 opportunities during the 22-day intervention phase (48.4%). Further analysis indicated that during the 20 days she was present, the teacher provided three opportunities on one day (5%), two opportunities on 10 days (50%), and one opportunity on nine days (45%), resulting in an overall dosage of 32 out of 60 possible opportunities (53.3%).

Adherence to protocol was defined as the extent to which the program is delivered as prescribed by the model (Cook et al., 2015), and was calculated by dividing the number of steps completed by the total number of steps possible and multiplied by 100. Due to the variability in the recorded frequency and dosage, adherence to protocol was further defined by examining the number of steps based on only the number of opportunities actually provided by the teacher (32 opportunities = 96 steps) rather than examining total steps possible for all possible opportunities (66 opportunities = 198 steps). For each occurrence of the Core Practice, three steps were required by the teacher: read the script, play the tone, and play the tone a second time. Data indicated the teacher missed one step (reading the script) on one opportunity, resulting in 95 steps (98.9%) complete.

The teacher and researcher agreed to meet weekly throughout the intervention phase. Fidelity of reporting was defined as the extent to which the teacher met with the researcher to review implementation data and discuss any issues or concerns, and was calculated by the number of meetings held divided by the total number of meetings possible and multiplied by 100. During the 5-week intervention phase, the teacher and researcher met five times (100%) to discuss implementation.

The fidelity of the researcher's implementation of the MindUp Curriculum was monitored through the use of session checklists (see Appendix D). Checklists were used to document the required components of each lesson per session. Due to the school's need for implementation across the entire school

year (36 weeks), content in each of the 15 lessons was provided over two weekly sessions. The remaining six sessions were designated for additional review as needed or specific activities (i.e., meditation, brain games). Each lesson during the intervention phase consisted of a brief review, introduction of the new concept, an activity, and the Core Practice.

The researcher self-documented fidelity of implementation and evaluated data for frequency, dosage, and adherence to protocol (see Table 7). Frequency and dosage were defined as the amount of the program delivered compared to the amount prescribed by the model and are used to measure students' exposure to the treatment (Cook et al., 2015). Frequency was calculated as the number of sessions completed divided by the number of sessions possible and multiplied by 100. The MindUp Plus group had Social Skills scheduled on Fridays with the researcher and there were five Friday sessions possible within the 5-week intervention phase. Lesson plan documentation indicated the researcher was present each Friday and there were no conflicting school activities (i.e., mass) during the scheduled session days, resulting in 5 days (100%) of implementation.

Dosage for the researcher was defined as the length of exposure to the Curriculum (minutes) and was calculated by dividing the number of minutes of instruction provided (session length) by the total number of minutes possible and multiplying by 100. Each session was 50 minutes in length, allowing for a total of 250 minutes of exposure during the intervention phase. Lesson plan documentation indicated there were no interruptions to the scheduled instruction

(i.e., fire drills), resulting in 250 minutes (100%) of exposure to the MindUp Curriculum.

Similar to the teacher, adherence to protocol for the researcher was defined as the extent to which the program is delivered as prescribed by the model (Cook et al., 2015). Adherence to protocol was self-recorded through the use of a session checklist completed by the researcher and calculated by dividing the number of components completed by the total number of components possible and multiplying by 100. The completed checklists indicated that all components were completed with the exception of one Core Practice on the Friday prior to Christmas break, resulting in 95% compliance.

Fidelity of reporting was defined as the extent to which the teacher met with the researcher to review implementation data and discuss any issues or concerns, and was calculated by the number of meetings held divided by the total number of meetings possible and multiplied by 100. During the 5-week intervention phase, the teacher and researcher met five times (100%) to discuss implementation.

Table 7

Percentage of teacher and researcher compliance with the treatment protocol

Fidelity Component	Percentage of Fidelity	
	Classroom Teacher	Researcher
Frequency	90.9	100
Dosage	53.3 (48.4) ^a	100
Protocol	98.9 ^b	95%
Reporting	100	100

Note.

^a Teacher data for dosage are reported as *percentage for the number of days present (percentage for the number of days possible)*.

^b Teacher data for protocol are reported as the percentage completed for the number of occurrences

Teacher Ratings of the Intervention

Teachers in the MindUp Plus and MindUp groups completed the Intervention Rating Profile (IRP)-15 to measure the acceptability of the intervention. Possible scores range from 15 to 90, with higher scores indicating higher acceptability (Chiak et al., 2007). The acceptability indicator is calculated by multiplying the number of items (15) by 3.5, the average score for acceptability, resulting in a score of 52.5, therefore values greater than 52.5 indicate the presence of an acceptable intervention (Von Brock & Elliott, 1987; Chiak et al., 2007).

The IRP-15 was administered to both teachers pre-and post-intervention. Teachers were informed of the two main intervention components- the MindUp Curriculum and the Core Practice- and asked to consider both when completing

the rating scale. Pre-intervention scores for both teachers indicated high acceptability, with the teacher in the MindUp group scoring higher (88) than the teacher in the MindUp Plus group (68). Closer examination of the scores indicated the MindUp Plus teacher rated eleven questions with a score of 5 (agree) and two questions with a score of 4 (slightly agree). Question 6 (*“Most teachers would find this intervention suitable for the needs of their students”*) received a score of 3 (slightly disagree). Question 5 (*“The students’ needs are severe enough to warrant the use of this intervention”*) received a score of 2 (disagree). The MindUp teacher rated thirteen questions with a score of 6 (strongly agree). Question 5 (*“The students’ needs are severe enough to warrant the use of this intervention”*) and question 10 (*“This intervention is consistent with those I have used in classroom settings”*) were rated with a score of 5 (agree). Post-intervention scores increased for the MindUp Plus teacher (78) as well as the MindUp teacher (90). Item number 2 (*“Most teachers would find this intervention appropriate for children with similar needs”*) was scored lower on the post-intervention scale than pre-intervention by the MindUp Plus teacher. She rated that item as a 5 (agree) pre-intervention and a 4 (slightly agree) post-intervention. All other changes in scores were positive.

Descriptive statistics (see Table 8) indicated a mean pretest score of 78 with a standard deviation of 14.14, and a posttest mean score of 84 with a standard deviation of 6. A paired-sample t test was used to determine any statistical or practical significance in the differences between teacher ratings of intervention acceptability (see Table 9). Results showed no statistically significant

gain ($t = 1.5$; $n = 2$; $p = .187$). The effect size was calculated by dividing the difference between the pre-and post-test means by the standard deviation of the pretest scores. The resulting effect size is .424, indicating a medium effect size suggesting the post-test scores were almost one-half standard deviation better than the pre-test. This effect size is consistent with the average effect size reported for research in education (Calin-Jageman & Cumming, 2019). This suggests that while there was no statistically significant difference in the scores, the intervention did have a practical effect on the teachers' ratings of its acceptability.

Table 8

Descriptive statistics of intervention acceptability

	Mean	N	SD	SE Mean
Pretest	78	2	14.14	10
Posttest	84	2	8.48	6

Note. Data reported are calculated from the acceptability scores, scale from 15-90

Table 9

Paired-sample t test results for intervention acceptability

	Mean	SD	SE Mean	t	df	Sig		d
						One sided	Two sided	
Pair 1 pre-post	-6.00	5.65	4.00	-1.50	1	.187	.374	.424

Note. Data reported are calculated from the acceptability scores, scale from 15-90

CHAPTER 5 DISCUSSION

This chapter will provide an overview and discussion of the results of this study, which examined whether a school-based mindfulness intervention with second grade students would increase the percentage of academic engagement, decrease the frequency of disruptive behavior, and impact the overall mood states reported by the groups over time. This study supplemented and expanded the current literature on the potential effectiveness of the MindUp Curriculum in a number of ways, including (a) conducting direct behavior observations; (b) using frequent measures of implementation fidelity (i.e., custom website, checklists); (c) focusing on general education students in the second grade attending private school; (d) examining one component of the MindUp Curriculum (the Core Practice) for potential impact; and (e) employing a single case experimental study design incorporating components from experimental (i.e., MindUp compared to MindUp Plus group) with single case (i.e., observed changes over time) designs.

Study Findings

Prior to intervention, both groups were found to engage in similar percentages of academic engagement, demonstrating low percentages of on-

task behaviors. During the implementation of the MindUp Curriculum and Core Practice, academic engagement improved for the MindUp Plus group and remained high throughout the intervention phase indicating a positive effect. Engagement in the MindUp group was never recorded to be as high or as stable compared to the group who received the additional prompts to engage in the Core Practice. The effectiveness of the intervention in increasing engagement was further supported by a large effect size as measured through the percentage of non-overlapping data points (PND). Lobo and colleagues (2017) suggested that a PND score greater than 70% indicated an effective intervention. In the MindUp Plus group, the PND score of 100% indicated that the combination of the MindUp Curriculum with additional Core Practice was very effective and supported the behavior observation data. In the MindUp group, the PND score of 62.5% indicated that the MindUp Curriculum alone provided a questionable effect, suggesting potential benefit from the weekly lessons.

The MindUp group demonstrated a higher frequency of disruptive behaviors (talking) in one observation during baseline, but both groups displayed similarly low frequencies during intervention. This is consistent with classroom observations and interactions as a whole; behavior incidents were minor and infrequent across grade levels as noted by the researcher. The only disruptive behaviors observed in either group throughout the study were talking and sharpening pencils without permission.

The impact on the overall mood of students in each group was more difficult to ascertain given the students' continued misuse of the 5-point scales.

Despite explicit instruction, modeling, and guided practice using the scales, students in both groups continued to mark more than one mood state. The most frequently marked unusable scales were a combination of 1 and 3 (MindUp group), 1, 2, 3, and 4 (MindUp Plus group), and 2 and 3 (MindUp Plus group). It is unclear if the students did not completely understand the analog scale or if the misuse was intentional. Using a visual analog scale in this way essentially asks the student to separate their perception of experience (their mood) into an ordered series from least to most. This skill is associated with the Piagetian Period of Concrete Operations and is typically observed in children age 7 or older (Shields et al., 2003). Although all students participating in the study were between the ages of 7-8 at the time of the study, that does not necessarily indicate that all students had reached the same developmental milestones. Overall, when taking scales that were rated as a 1 or a combination of 1 and 2, the majority of students in both the MindUp Plus and MindUp groups reported they were ready to learn (79.9% and 76.3% respectively). There were fewer scales in the MindUp Plus group (2.0%) indicating the other end of the mood spectrum at 5 or 4 and 5 than in the MindUp group (3.8%).

Limitations

Despite the strengths of the current study and the apparent effectiveness of the intervention, there were several limitations that may have influenced internal and external validity. First, the study design, though unique, presented challenges during data analysis. If considered strictly a single case design, the study appears to be a withdrawal (A-B) design. The study was lacking sufficient

data in the follow-up phase to be considered a reversal (A-B-A) design, and since the MindUp group did not receive the increased frequency of the Core Practice it could not be considered as a multiple baseline design. Without the additional baseline phase that is part of a reversal design, it is difficult to assess with certainty if the observed effects were solely due to the intervention, and not the result of other factors. If considered a quasi-experimental design, measuring changes in behavior over time, the question became not only *how*, but also *when* to analyze the observed changes in behavior. As this was not a pre/post design utilizing a rating scale, it was not clear how to determine when “post-intervention” behavior truly occurred. Several methods were considered, including using only the final data point in the intervention phase, comparing only the mean during baseline to the mean during intervention, or using the mean of the final two to three data points during intervention to represent “post-intervention”. Though these methods may have lent themselves to more statistical analyses, they did not capture the true meaning of the data; that is, the idea that changes in behavior in response to mindfulness-based interventions require time and practice. Additional studies in the future utilizing this design are needed to establish a research-based method for data analysis and reporting.

A second limitation relates to the selection of participants, both students and teachers. The researcher was approached by school administrators to teach a Social Skills class, indicating a willingness to participate at the school level. Participation in the study was also based on the teacher willingness. By recognizing the need for the intervention, and being willing to participate,

teachers may have unintentionally biased their reports. Conducting direct behavior observations was intended to lessen the risk of this bias, but it may still be present nonetheless. Additionally, the participants were not representative of marginalized communities. Although a high prevalence of ACEs was not immediately apparent, anecdotal student reports indicated the presence of trauma and mental health concerns related to the pandemic as well as other factors. While this is not necessarily a limitation, future research should examine the impact of this intervention with students in underserved communities who experience ACEs to a higher degree.

The age of the participants is an important factor and potential limitation as well. Second grade was chosen specifically to address a gap in the existing literature, but students this age may not be able to accurately complete a visual analog scale. Using a visual analog scale in this way essentially asks the student to separate their perception of experience (their mood) into an ordered series from least to most. This skill is associated with the Period of Concrete Operations and is typically observed in children age 7 or older. Although all students participating in the study were between the ages of 7-8 at the time of the study, that does not necessarily indicate that all students had reached the same developmental milestones. Future research examining mood or “ready to learn” states in this age group will need to take this into account.

Another limitation of this study relates to the limited interobserver agreement data. Due to time constraints, a limited number of days were available for observation. As is the case frequently when conducting research in schools,

unforeseen changes to the calendar of activities prevented the final scheduled observations. In the future, it would be beneficial to work with local observers as well as build in additional observation days into the intervention timeline.

A major limitation to the study was the low fidelity of implementation for the teacher. Initially, the teacher agreed to prompting the Core Practice three times per day. However, after fall break the students began switching classes in the afternoon and it became increasingly difficult for her to fit the third breathing exercise into the schedule. During the weekly reporting meetings, she indicated that twice per day was much more appropriate, but data analysis indicated that was still too much as she frequently only recorded one instance of the Core Practice on multiple days. It is possible that the teacher was prompting and not capturing the data through the website, and additional observation sessions to measure her implementation fidelity may have been able to address that concern. Even as a willing and interested participant she was not able to implement the 2-to-3-minute intervention with fidelity. Researchers should take this into account when working with educators who are already overworked and possibly overwhelmed. Teachers may need additional support to schedule and implement interventions within their already busy days. It would have been helpful for the teacher training to include trial runs, where the teacher blocked out 2-3 minutes three times per day for a different purpose to make sure she could fit the Core Practice into her schedule. Additionally, there was no plan in place for the additional prompting to occur when the teacher was absent, and two days were lost during the intervention phase. Future research should focus on

strategies for increasing the likelihood of implementation, regardless of who is in the classroom.

Implications for Practice

Even with the significant limitations, the results indicated that utilizing the MindUp Curriculum in addition to increased use of the Core Practice was effective in increasing the academic engagement for students in the MindUp Plus group. This effect was still observable 11 weeks post-intervention. Academic engagement also seemed to increase in response to the weekly MindUp sessions provided to the MindUp group. While the impact on students' overall moods was less clear, it is possible that exposure to the Curriculum and Core Practice, even if not to the required dosage, was still beneficial for students. This is very promising for educators who may be struggling to identify ways to help their students and who may not have the time or resources to dedicate to a complicated intervention. The intervention in this study required 50 minutes of class time once per week, and 2-to-3 minutes of breathing exercises once or twice per day. That may be a feasible starting point for those wishing to introduce mindfulness-based interventions into their classrooms.

Conclusion

In conclusion, this study examined the effects of a mindfulness-based intervention on students' academic engagement, frequency of disruptive behavior, and overall mood states, and resulted in mixed effects. While the intervention did not impact disruptive behavior, and its impact on mood was questionable, results indicated it was effective in increasing the percentage of

academic engagement in the MindUp Plus group. This study suggests that the MindUp Curriculum and Core Practice could be an effective intervention but requires further study. The increasing need for interventions that enable students to manage their trauma symptoms, or behavior in general, would suggest that additional evidence supporting inexpensive, effective, and efficient interventions is critical for improving student outcomes.

REFERENCES

- Artz, S., Jackson, M. A., Rossiter, K. R., Nijdam-Jones, A., Geczy, I., & Porteous, S. (2014). A comprehensive review of the literature on the impact of exposure to intimate partner violence for children and youth. *International Journal of Child, Youth and Family Studies*, 5(4), 493-587.
<http://doi.org/10.18357/ijcyfs54201413274>
- Ascone, L., Schlier, B., Sundag, J., & Lincoln, T. M. (2020). Pathways from insecure attachment dimensions to paranoia: The mediating role of hyperactivating emotion regulation versus blaming others. *Psychology and Psychotherapy*, 93(1), 72-87. <http://doi.org/10.1111/papt.12208>
- Bauer, L. (2020, May 6). The COVID-19 crisis has already left too many children hungry in America. *Brookings*. <https://www.brookings.edu/blog/up-front/2020/05/06/the-covid-19-crisis-has-already-left-too-many-children-hungry-in-america/>
- Bluth, K., Campo, R. A., Pruteanu-Malinici, S., reams, A., Mullarkey, M., & Broderick, P. (2016). A school-based mindfulness pilot study for ethnically diverse at-risk adolescents. *Mindfulness*, 7(1), 90-104.
<http://doi.org/10.1007/s12671-014-0376-1>
- Bishop, S.R., Lau, M., Shapiro, S., Carlson, L., Anderson, N.D., Carmody, J., Segal, Z.V., Abbey, S., Speca, M., Velting, D. and Devins, G. (2004).

- Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11, 230-241. <https://doi.org/10.1093/clipsy.bph077>
- Borquist-Conlon, D. S., Maynard, B. R., Brendel, K. E., & Farina, A. S. J. (2019). Mindfulness-based interventions for youth with anxiety: A systematic review and meta-analysis. *Research on Social Work Practice*, 29(2), 195-205. <http://doi.org/10.1177/1049731516684961>
- Bothe, D. A., Grignon, J. B., & Olness, K. N. (2014). The effects of a stress management intervention in elementary school children. *Journal of Developmental and Behavioral Pediatrics*, 35(1), 62-67. <https://doi.org/10.1097/DBP.0000000000000016>
- Brenning, K. M., Soenens, B., Braet, C., & Bosmans, G. (2012). Attachment and depressive symptoms in middle childhood and early adolescence: Testing the validity of the emotion regulation model of attachment. *Personal Relationships*, 19, 445-464. <http://doi.org/10.1111/j.1475-6811.2011.01372.x>
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32(7), 513-531.
- Calin-Jageman, R. J., & Cumming, G. (2019). The new statistics for better science: Ask how much, how uncertain, and what else is known. *The American Statistician*, 73, 271-280. <http://doi.org/10.1080/00031305.2018.1518266>
- Carvalho, J. S., Pinto, A. M., & Morocco, J. (2017). Results of a mindfulness-based social-emotional learning program on Portuguese elementary

- students and teachers: A quasi-experimental study. *Mindfulness*, 8, 337-350. <http://doi.org/10.1007/s12671-016-0603-z>
- Cataldo, M. F., & Risley, T. R. (1973, August). *Development of a standardized measure of classroom participation* [Paper presentation]. American Psychological Association, Montreal, Canada.
- Cataldo, M. F., & Risley, T. R. (1974). Evaluation of planned activities: The PLA-Check measure of classroom participation. In P. O. Davidson, F. W. Clark, & L. A. Hamerlynck (Eds.), *Evaluation of behavioral programs in community, residential, and school settings*. Research Press.
<http://doi.org/10.1176/ps.26.11.764-b>
- Chafouleas, S. M., Koriakin, T. A., Roundfield, K. D., & Overstreet, S. (2018). Addressing childhood trauma in school settings: A framework for evidence-based practice. *School Mental Health*, 11(40), 40-53.
<http://doi.org/10.1007/s12310-018-9256-5>
- Cheang, R., Gillions, A., & Sparkes, E. (2019). Do mindfulness-based interventions increase empathy and compassion in children and adolescents: A systematic review. *Journal of Child and Family Studies*, 28(7), 1765–1779. <https://doi.org/10.1007/s10826-019-01413-9>
- Chimiklis, A. L., Dahl, V., Spears, A. P., Goss, K., Fogarty, K., & Chacko, A. (2018). Yoga, mindfulness, and meditation interventions for youth with ADHD: Systematic review and meta-analysis. *Journal of Child & Family Studies*, 27, 3155–3168. <https://doi.org/10.1007/s10826-018-1148-7>

- Chiak D., Alberto, P. A., & Frederick, L. D. (2007). Use of brief functional analysis and intervention evaluation in public settings. *Journal of Positive Behavior Interventions*, 9(2), 80-93. <http://doi.org/10.1177/10983007070090020501>
- Cole, S.F., Greenwald O'Brien, J., Gadd, G., Ristuccia, J., Wallace, L., & Gregory, M. (2005). *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children. <https://traumasensitiveschools.org/tlpi-publications/download-a-free-copy-of-helping-traumatized-children-learn/>
- Collaborative for Academic, Social, and Emotional Learning. (2021). *Guide for High-Quality Social and Emotional Learning Programs*. <https://pg.casel.org/>
- Common, E. A., & Lane, K. L. (2017). Social validity assessment. In J. K. Luiselli (Ed.), *Applied behavior analysis advanced guidebook: A manual for professional practice* (pp. 73-92). Elsevier Inc. <http://doi.org/10.1016/C2016-0-01055-0>
- Cook, B. G., Buysse, V., Klingner, J., Landrum, T. J., McWilliam, R. A., Tankersley, M., & Test, D. W. (2015). CEC's Standards for Classifying the Evidence Base of Practices in Special Education. *Remedial and Special Education*, 36(4), 220–234. <https://doi.org/10.1177/0741932514557271>
- Cooper, J., Heron, T., & Heward, W. (2007). *Applied behavior analysis (2nd ed.)*. Pearson.
- Crooks, C. V., Bax, K., Delaney, A., Kim, H., & Shokoohi, M. (2020). Impact of MindUp among young children: Improvements in behavioral problems,

adaptive skills, and executive functioning. *Mindfulness*, 11, 2433-2444.

<http://doi.org/10.1007/s12671-020-01460-0>

Emerson, L. M., Nabinger de Diaz, N., Sherwood, A., Waters, A., & Farrell, L.

(2019). Mindfulness interventions in schools: Integrity and feasibility of implementation. *International Journal of Behavioral Development*, 1, 1-14.

<https://doi.org/10.1177/0165025419866906>

Every Student Succeeds Act, 20 U.S.C. § 6301 (2015).

<http://www.congress.gov/114/plaws/publ95/PLAW-114publ95.pdf>

Eyuboglu, M. & Eyuboglu, D. (2020). Emotional regulation and attachment style in previously untreated adolescents with attention deficit and hyperactivity disorder. *The Journal of Psychiatry and Neurological Sciences*, 33, 228-

236. <http://doi.org/10.14744/DAJPNS.2020.00086>

Felitti, V. J., Anada, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M.,

Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experience (ACE) study. *American Journal of Preventive Medicine*, 14(4), 245-258.

[http://doi.org/10.1016/S0749-3797\(98\)00017-8](http://doi.org/10.1016/S0749-3797(98)00017-8)

Felver, J. C., Celis-de Hoyos, C. E., Tezanos, K., & Singh, N. N. (2016). A

systematic review of mindfulness-based interventions for youth in school settings. *Mindfulness*, 7, 34–45. <http://doi.org/10.1007/s12671-015-0389-4>

Felver, J. C., Felver, S. L., Margolis, K. L., Ravitch, N. K., Romer, N., & Horner, R. H.

(2017). Effectiveness and social validity of the soles of the feet mindfulness-based intervention with special education students.

Contemporary School Psychology, 21, 358-369.

<http://doi.org/10.1007/s40688-017-0133-2>

Finkelhor, D, Turner, H. A., Shattuck, A., & Hamby, S. L. (2015). Prevalence of childhood exposure to violence, crime, and abuse: Results from the national survey of children's exposure to violence. *JAMA Pediatrics*, 169(8), 746-754. <http://doi.org/10.1001/jamapediatrics.2015.0676>

Francis, M. (2014). *A mindfulness intervention with mildly intellectually delayed high school students* [Master's thesis, Gordon Albright School of Education]. City University of Seattle Academic Repository.

<http://hdl.handle.net/20.500.11803/154>

Frank, J. L., Bose, B., & Schrobenhauser-Clonan, A. (2014). Effectiveness of a school-based yoga program on adolescent mental health, stress coping strategies, and attitudes toward violence: Findings from a high-risk sample. *Journal of Applied School Psychology*, 30(1), 29-49.

<https://doi.org/10.1080/15377903.2013.863259>

Garcia, A., and Davis, E. (2019, April). ESSA action guide: Selecting evidence-based practices for underperforming schools. Retrieved October 24, 2019, from

<https://www.air.org/resource/essa-action-guide-selecting-evidence-based-practices-low-performing-schools>

- Grasso, D. J., Dierkhising, C. B., Branson, C. E., Ford, J. D., & Lee, R. (2016). Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *Journal of Abnormal Child Psychology*, *44*(5), 871-886. <http://doi.org/10.1007/s10802-015-0086-8>
- Hang, A. H., Franklin, C., Cole, A. H., Panisch, L. S., Yan, Y., & Jones, K. (2021). Impact of MindUp on elementary school students' classroom behaviors: A single-case design pilot study. *Children and Youth Services Review*, *125*, 1-9. <http://doi.org/10.1016/j.chilyouth.2021.105981>
- Harpin, S. B., Rossi, A., Kim, A. K., & Swanson, L. M. (2016). Behavioral impacts of a mindfulness pilot intervention for elementary school students. *Education*, *137*(2), 149-156.
- Hawn Foundation. (2011). *The MindUp curriculum: Brain-focused strategies for learning and living*. Scholastic. <http://mindup.org>
- Henly, L. E. (2017). *Efficacy of mindfulness and nonverbal learning disabilities with a single-subject, neuropsychologically driven paradigm* (Publication No. 10623598) [Doctoral dissertation, Chicago School of Professional Psychology]. ProQuest Dissertations and Theses Global.
- Hillis, S., Mercy, J., Amobi, A., & Kress, H. (2016). Global prevalence of past-year violence against children: A systematic review and minimum estimates. *Pediatrics*, *137*(3). <http://doi.org/10.1542/peds.2015-4079>

- Keng, S-L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review, 31*, 1041-1056. <http://doi.org/10.1016/j.cpr.2011.04.006>
- Kim, S., Crooks, C. V., Bax, K., & Shokoohi, M. (2021). Impact of trauma-informed training and mindfulness-based social-emotional learning program on teacher attitudes and burnout: A mixed-methods study. *School Mental Health, 13*, 55-68. <http://doi.org/10.1007/s12310-020-09406-6>
- Klingbiel, D. A., Fischer, A. J., Renshaw, T. L., Bloomfield, B. S., Polakoff, B., Willenbrink, J. B., Copek, R. A., & Chan, K. T. (2017). Effects of mindfulness-based interventions on disruptive behavior: A meta-analysis of single-case design. *Psychology in the Schools, 54*(1), 70-87. <https://doi.org/10.1002/pits.21982>
- Kostova, Z., Levin, L., Lorberg, B., & Ziedonis, D. (2019). Mindfulness-based interventions for adolescents with mental health conditions: A systematic review of the research literature. *Journal of Child and Family Studies, 28*, 2633–2649. <https://doi.org/10.1007/s10826-019-01477-7>
- Kulick, G. A. (2019). *Effects of stress reduction instruction in kindergarten to improve self-regulation and academic achievement* (Publication No. 27546932) [Doctoral dissertation, Grand Canyon University]. ProQuest Dissertations and Theses Global.
- Kuypers, L. (2011). *The zones of regulation*. Think Social Publishing.
- Lobo, M. A., Moeyaert, M., Cunha, A. B., & Babik, I. (2017). Single-case design, analysis, and quality assessment for intervention research. *Journal of*

Neurological Physiology, 41(3), 187-197.

<http://doi.org/10.1097/NPT.000000000000187>

Long, A. C. J., Renshaw, T. L., & Camarota, D. (2018). Management in an urban, alternative school: A comparison of mindfulness and behavioral approaches. *Contemporary School Psychology*, 22, 233-248.

<https://doi.org/10.1007/s40688-018-0177-y>

Maloney, J. E. (2015). *Early adolescents' evaluations of MindUp: A universal mindfulness-based social and emotional learning program* [Master's thesis, University of British Columbia].

<http://dx.doi.org/10.14288/1.0166337>

Matsuba, K. M., Schonert-Reichl, K. A., McElroy, T., & Katahoire, A. (2020). Effectiveness of a SEL/mindfulness program on Northern Ugandan children. *International Journal of School and Educational Psychology*, 1-

19. <http://doi.org/10.1080/21683603.2020.1760977>

Maynard, B. R., Solis, M. R., Miller, V. L., & Brendel, K. E. (2017). Mindfulness-based interventions for improving cognition, academic achievement, behavior, and socioemotional functioning of primary and secondary school students. *Campbell Collaboration*, 5, 5-143.

<http://doi.org/10.4073/csr.2017.5>

Martens, B. K., Peterson, R. L., Witt, J. C., & Cirone, S. Teacher perceptions of school-based interventions. *Exceptional Children*, 53(3), 213-223.

<http://doi.org/10.1177/001440298605300303>

- McKeering, P. & Hwang, Y. (2019). A systematic review of mindfulness-based school interventions with early adolescents. *Mindfulness, 10*, 593-610. <https://doi.org/10.1007/s12671-018-0998-9>
- McLaughlin, K. A., Sheridan, M. A., & Lambert, H. K. (2014). Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neuroscience & Behavioral Reviews, 47*, 578-591. <http://doi.org/10.1016/j.neubiorev.2014.10.012>
- National Child Traumatic Stress Network. (2020). *About child trauma*. <https://www.nctsn.org/what-is-child-trauma/about-child-trauma>
- Nilsson, H., & Kazemi, A. (2016). Recognizing and thematizing definitions of mindfulness: The big five of mindfulness. *Review of General Psychology, 20*(2), 183-193. <https://doi.org/10.1037/gpr0000074>
- Pappa, S., Ntella, V., Giannakas, T., Ginnakoulis, V. G., Papoutsis, E., & Katsaounou, P. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, Behavior, and Immunity, 88*, 901-907. <http://doi.org/10.1016/j.bbi.2020.05.026>
- Peck, H. L., Kehle, T. J., Bray, M. A., & Theodore, L. A. (2005). Yoga as an intervention for children with attention problems. *School Psychology Review, 34*(3), 415-424. <https://doi.org/10.1080/02796015.2005.12086295>
- Saunders, B. E., & Adams, Z. W. (2014). Epidemiology of traumatic experiences in childhood. *Child and Adolescent Psychiatry Clinics of North America, 23*(2), 167-184. <http://doi.org/10.1016/j.chc.2013.12.003>

- Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental Psychology, 51*(1), 52-66.
<http://doi.org/10.1037/a0038454>
- Segal, S. C., Vyas, S. S., & Monsoon, C. M. (2020). A systematic review of mindfulness-based interventions in low-income schools. *Mindfulness, 12*, 1316-1331. <http://doi.org/10.1007/s12671-020-01571-8>
- Senate Bill 1, RS. (2019). Retrieved from
<https://apps.legislature.ky.gov/record/19rs/sb.1.html>
- Shields, B. J., Palermo, T. M., Powers, J. D., Grewe, S. D., & Smith, G. A. (2003). Predictors of a child's ability to use a visual analogue scale. (2003). *Child Care Health and Development, 29*(4), 281-290.
<http://doi.org/10.1046/j.1365-2214.2003.00343.x>
- Substance Abuse and Mental Health Services Administration, (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach* (HHS Publication No. (SMA)14-4884).
<https://store.samhsa.gov/system/files/sma14-4884.pdf>
- Thierry, K. L., Bryant, H. L., Nobles, S. S., & Norris, K. S. (2016). Two-year impact of a mindfulness-based program on preschoolers' self-regulation and academic performance. *Early Education and Development, 1*-17.
<http://doi.org/10.1080/10409289.2016.1141616>

US Department of Health and Human Services; Administration for Children and Families; Administration on Children, Youth and Families; Children's Bureau. Child Maltreatment 2017. Washington, DC: US Government Printing Office; 2019

Von Brock, M. B., & Elliott, S. N. (1987). Influence of treatment effectiveness information on the acceptability of classroom interventions. *Journal of School Psychology, 25*, 131-144. [http://doi.org/10.1016/0022-4405\(87\)90022-7](http://doi.org/10.1016/0022-4405(87)90022-7)

Wewers, M. E., & Lowe, N. K. (1990). A critical review of visual analog scales in the measurement of clinical phenomena. *Research in Nursing & Health, 13*, 227-236. <http://doi.org/10.1002/nur.4770130405>

Zakszeski, B. N., Ventresco, N. E., & Jaffe, A. R. (2017). Promoting resilience through trauma-focused practices: A critical review of school-based implementation. *School Mental Health, 9*, 310-321. <http://doi.org/10.1007/s12310-017-9228-1>

Zenner, C., Herrnleben-Kurz, S., & Walach, H. (2014). Mindfulness-based interventions in schools-a systematic review and meta-analysis. *Frontiers in Psychology, 5*, 1-20. <http://doi.org/10.3389/fpsyg.2014.00603>

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2014). Mindfulness interventions with youth: A meta-analysis. *Mindfulness, 6*. <http://doi.org/10.1007/s12671-013-0260-4>

LIST OF APPENDICES

Appendix A: PLA-Check Observation Data Collection Sheet

Appendix B: 5-point Visual Analog Scale

Appendix C: IRP-15 Data Collection Sheet (Pre-and Post-test)

Appendix D: Researcher Implementation Fidelity Data Collection Sheet
(Checklist)

Appendix E: Teacher Implementation Fidelity Data Collection (Webpage)

APPENDIX A

Observer Name _____ Date _____

Content area _____ Activity (circle) _____ WG _____ SG _____ Ind. _____ 1 on 1 _____

Class (circle) _____ 2D _____ 2M _____

Start time _____ End time _____

Number of students present _____

	Int. #1	Int. #2	Int. #3	Int. #4	Int. #5	Int. #6	Int. #7	Int. #8	Int. #9	Int. #10	Total
Engaged											
Not engaged, not disruptive											
Disruptive											
Number of students present for each interval											






students to meet 80% criteria: (0.8 x total # students) = _____

intervals to meet 80% criteria: (0.8 x total # intervals) = _____

% intervals in which 80% or more of class is on task (# Int. at 80%/total # Int.) x 100 = _____

Notes: _____

APPENDIX B

5	 Angry	
4	 Overwhelmed	
3	 Upset	
2	 Sad	
1	 Ready to Learn	

APPENDIX C

Pre-Intervention

Grade level _____ Rater completing this form _____ Date _____

Adapted version of the Intervention-Rating Profile-15

The purpose of this questionnaire is to obtain information that will aid in the selection of future classroom interventions. These interventions may be used by teachers of children with identified needs. Please circle the number which best describes your agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This would be an acceptable intervention for the students' needs.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for children with similar needs.	1	2	3	4	5	6
3. This intervention should prove effective in supporting the students' needs.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The students' needs are severe enough to warrant use of this intervention.	1	2	3	4	5	6
6. Most teachers would find this intervention suitable for the needs of their students.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom setting.	1	2	3	4	5	6
8. This intervention would <i>not</i> result in negative side effects for these students.	1	2	3	4	5	6
9. This intervention would be appropriate for a variety of children.	1	2	3	4	5	6
10. This intervention is consistent with those I have used in classroom settings	1	2	3	4	5	6
11. The intervention is a fair way to handle the students' needs.	1	2	3	4	5	6
12. This intervention is reasonable for the needs of the students.	1	2	3	4	5	6
13. I like the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention would be a good way to handle these students' needs.	1	2	3	4	5	6
15. Overall, this intervention would be beneficial for these students.	1	2	3	4	5	6

Source: Adapted from Witt, J.C. & Elliott, S.N. (1985). Acceptability of classroom intervention strategies. In Kratochwill, T.R. (Ed.), *Advances in School Psychology*, Vol. 4, 251 – 288. Mahwah, NJ: Erlbaum. Reproduced under Fair Use of copyrighted materials for education, scholarship, and research. 17 U.S.C. § 107

Post-Intervention

Grade level _____ Rater completing this form _____ Date _____

Adapted version of the Intervention-Rating Profile-15

The purpose of this questionnaire is to obtain information that will aid in the selection of future classroom interventions. These interventions may be used by teachers of children with identified needs. Please circle the number which best describes your agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This was an acceptable intervention for the students' needs.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for children with similar needs.	1	2	3	4	5	6
3. This intervention proved effective in supporting the students' needs.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The students' needs were severe enough to warrant use of this intervention.	1	2	3	4	5	6
6. Most teachers would find this intervention suitable for the needs of their students.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom setting.	1	2	3	4	5	6
8. This intervention did <i>not</i> result in negative side effects for these students.	1	2	3	4	5	6
9. This intervention would be appropriate for a variety of children.	1	2	3	4	5	6
10. This intervention was consistent with those I have used in classroom settings	1	2	3	4	5	6
11. The intervention was a fair way to handle the students' needs.	1	2	3	4	5	6
12. This intervention was reasonable for the needs of the students.	1	2	3	4	5	6
13. I liked the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention was a good way to handle these students' needs.	1	2	3	4	5	6
15. Overall, this intervention was beneficial for these students.	1	2	3	4	5	6

Source: Adapted from Witt, J.C. & Elliott, S.N. (1985). Acceptability of classroom intervention strategies. In Kratochwill, T.R. (Ed.), *Advances in School Psychology*, Vol. 4, 251 – 288. Mahwah, NJ: Erlbaum. Reproduced under Fair Use of copyrighted materials for education, scholarship, and research. 17 U.S.C. § 107

APPENDIX D

Lesson:

Week/dates:

Components	Content	Notes
Review Hand Model		
Introduce new brain structure/function		
Activity		
Core Practice		
Review Hand Model		
Introduce new mindfulness skill		
activity		
Core Practice		

APPENDIX E



Classroom Breathing Exercise

"It's time for our Breathing Exercise. Make sure you're sitting comfortably, and close your eyes or look down into your hands. When you hear the sound, listen as long as you can. When the sound has faded, begin to focus on every breath as you take it in and let it out. When you hear the sound a second time, listen as long and carefully as you can, still breathing calmly. When you can't hear the sound any longer, slowly open your eyes but remain still and calm."

 riggs158@gmail.com (not shared) [Switch account](#) 

Read script

Complete

Press the big blue button to play sound

Complete

Wait ten seconds, play sound again

Complete

Submit

[Clear form](#)

Google Forms This content is neither created nor endorsed by Google. 

CURRICULUM VITAE

Leah Riggs

Doctoral Candidate, University of Louisville College of Education Department of
Special Education, Early Childhood, & Prevention Science

Leah.riggs@louisville.edu

Areas of Specialization

Trauma-informed education, school based mental health, and social-emotional learning

Evidence-based practices

Multi-tiered systems of support

Education and Professional Credentials

Degrees

May 2022	PhD	University of Louisville	College of Education, Department of Special Education, Early Childhood, & Prevention Science Concentrations: evidence-based practices, social-emotional learning, trauma-informed education Dissertation: <i>Effects of a mindfulness-based intervention on students' academic engagement, frequency of disruptive behavior, and self-reported mood states</i> Advisor: Tim Landrum
May 2009	MS and Rank 1	University of Kentucky	Department of Early Childhood, Special Education, and Counselor Education Concentrations: special education, moderate and severe disabilities, evidence-based practices Thesis: <i>The use of constant time delay with multiple exemplars and non-</i>

targeted information when teaching principles of heredity to high school students with moderate and severe disabilities in accordance with the Kentucky Alternate Assessment
 Summa Cum Laude
 Advisor: Belva Collins

May 2000 Bachelor of Arts Indiana University Southeast Departments of Natural and Social Sciences
 Concentrations: biology, psychology, chemistry
 Highest Distinction, Biology Student of the Year

License
 Current through 2024 Commonwealth of Kentucky Professional Certificate for Teaching Exceptional Children--Moderate and Severe Disabilities, Grades Primary Through 12

Certifications and Affiliations

Professional Society Memberships

Current Council for Exceptional Children

Additional Certifications

2019 Trauma Treatment Professional for Children and Adolescents
 2018 Youth Mental Health First Aid, Train the Trainer
 2018 Trauma-Informed Care for School Personnel, Train the Trainer
 2018 PREPaRE Crisis Responder

Professional Experiences

2021-current Social Emotional Learning Coach, Grades K-5
 St. Joseph School, Bardstown, KY

2020-current Professional Learning Consultant, MAP Growth Data Analysis
 NWEA, Portland, OR

2012-2019 Special Education Consultant
 Bullitt County Public Schools, Shepherdsville, KY

2011-2012	Admissions and Release Committee Chairperson Nelson County Public Schools, Bardstown, KY
2010-2011	Exceptional Child Consultant Kentucky Department of Education, Frankfort, KY
2006-2010	Exceptional Child Educator, Moderate and Severe Disabilities Elizabethtown Independent Schools, Elizabethtown High School Elizabethtown, KY

Publications

- Riggs, L., & Landrum, T. J. (2022). *Trauma-informed PBIS: How educators can combine evidence-based practices for behavior management with trauma-informed care* [Manuscript in preparation]. Department of Special Education, Curriculum and Instruction, University of Louisville.
- Riggs, L., Landrum, T. J., Brewer, B. B., McClure, E. D., & Morris, S. D. (2021). *School-based mindfulness interventions and students exposed to childhood trauma: A systematic review and evaluation of the current evidence* [Manuscript in preparation]. Department of Special Education, Curriculum and Instruction, University of Louisville.
- Brewer, B. N., Riggs, L., Courtade, G., & Landrum, T. (2021). Utilizing caregiver support to promote efficacy of non-traditional instruction provided to students with extensive support needs. *Rural Special Education Quarterly*. <http://doi.org/10.1177/87568705211049338>
- Riggs, L., Collins, B. C., Kleinert, H., & Knight, V. E. (2013). Teaching principles of heredity to high school students with moderate and severe disabilities. *Research and Practice for Persons with Severe Disabilities*, 38 (1), 30-43, <http://doi.org/10.2511/027494813807046971>
- Kleinert, H. K., Collins, B. C., Wickham, D., Riggs, L. & Hager, K. D. (2010). Embedding life skills, self-determination, social relationships, and other evidence-based practices. In Kleinert, H. L., & Kearns, J. F. (Eds.), *Alternate Assessment for Students with Significant Cognitive Disabilities* (pp. 267-289). Paul Brooks Publishing.
- Collins, B. C., Karl, J., Riggs, L., Galloway, C. C., & Hager, K. (2010). Teaching core content with real-life applications to secondary students with

moderate and severe disabilities. *TEACHING Exceptional Children*, 43 (1), 52-59, <http://doi.org/10.1177/004005991004300106>

Edmonds, K., Riggs, L., & Masden, T. (2005). Effects of photoperiod, melatonin, and the pineal gland on compensatory gonadal hypertrophy during postnatal development in the marsh rice rat (*Oryzomys palustris*). *Zoological science*, 22, 763-74. <http://doi.org/10.2108/zsj.22.763>

Edmonds, K., Riggs, L., & Stetson, M. (2003). Food availability and photoperiod affect reproductive development and maintenance in the marsh rice rat (*Oryzomys palustris*). *Physiology & Behavior*, 78, 41-49. [http://doi.org/10.1016/S0031-9384\(02\)00943-5](http://doi.org/10.1016/S0031-9384(02)00943-5)

Presentations

National Presentations: Refereed

- Riggs, L. (2021). *Best practices for supporting students exposed to trauma* [Workshop]. Learning Forward, virtual.
- Riggs, L. (2021). *Mindfulness: Current evidence, best practice, and directions for future research* [Conference session]. Annual Conference on Advancing School Mental Health, virtual.
- Landrum, T., Collins, L., Riggs, L., & McClure, E. (2020). *Zero tolerance for zero tolerance* [Conference session]. Council for Exceptional Children, Portland, OR.

State and Local Presentations: Refereed

- Riggs, L. (2019). *Trauma-informed care for educators* [Conference session]. Kentucky Council for Exceptional Children, Louisville, KY.
- Riggs, L. (2019). *Taking trauma-informed care from classroom to schoolwide implementation* [Conference session]. Kentucky Council for Children with Behavior Disorders Behavior Institute, Louisville, KY.
- Riggs, L. (2018). *Trauma-informed care 101* [Conference session]. Kentucky Council for Exceptional Children, Louisville, KY.
- Riggs, L. (2017). *Youth Mental Health First Aid: An introduction* [Conference session]. Kentucky Council for Exceptional Children, Louisville, KY.
- Riggs, L. & Faulhaber, M. (2016). *Tech replacements for readers and scribes* [Conference session]. Kentucky Society for Technology in Education, Louisville, KY.
- Riggs, L. (2015). *Strategies for managing classroom behavior* [Conference session]. Kentucky Council for Exceptional Children, Louisville, KY.
- Riggs, L., & Robey, T. (2011). *Kentucky's alternate assessment: An overview* [Conference session]. The ARC of Kentucky, Louisville, KY.
- Riggs, L. (2010). *Instructional strategies for students with moderate and severe cognitive disabilities* [Conference session]. Kentucky Council for Exceptional Children, Louisville, KY.

Grant Writing

Jan. 1, 2019-Dec. 31, 2023 Funded for \$1.9M	<i>Advancing Wellness and Resiliency in Education State Education Agency Grant (Project AWARE-SEA) (CFDA) No.: 93.243</i>	Department of Health and Human Services, Substance Abuse and Mental Health Services Administration Role: Co-PI Role in preparation: Contributor
Nov. 1, 2018-March 31, 2019 Funded for \$1,859	<i>Regulating Emotions and Calming Down</i>	Bullitt County Excellence in Public Education Foundation Grant Role: PI

Teaching Experience

Co-Teaching		
Spring 2022 (virtual)	EDSP 510 Special Education and the Law	With Scott Patton, University of Louisville
Spring 2021 (virtual)	PSYC 305 Brain and Behavior, virtual	With Brendan Depue, University of Louisville
Fall 2020 (virtual)	EDSP 653 Advanced Practicum, virtual	With Tim Landrum, University of Louisville
Fall 2019 (in person)	EDSP 240 Introduction to Special Education	With Scott Patton, University of Louisville
Guest Lectures		
Spring 2022 (hybrid)	EDSP 345 Special Populations in Schools <i>IEP Contents and Compliance</i>	Taught by Scott Patton, University of Louisville
Spring 2021 (virtual)	EDTP 328 Building Learning Communities	Taught by Samantha Morris, University of Louisville
Fall 2020 (virtual)	<i>Trauma-informed care for educators</i>	
Fall 2020 (virtual)	EDTP 633 Alternate Certification in Elementary Education <i>Understanding the impact of trauma on instructional readiness</i>	Taught by Samantha Morris, University of Louisville

Spring 2020 (in person)	EDSP 240 Special Populations <i>Instructional strategies for students with moderate and severe disabilities</i>	Taught by Scott Patton, University of Louisville
----------------------------	--	---

Service

State Level Service

2019	Member, Kentucky Interconnected Systems Framework Workgroup with the Kentucky Department of Education
2018-2019	Member, Mental Health Technical Transfer Center National MTSS Learning Collaborative with the Kentucky Department of Education
2016-2018	Member, Trauma-Informed Care for Educators Learning Collaborative with the Center on Trauma and Children, University of Kentucky
2009	Reviewer, Missouri Alternate Assessment Program with the Missouri Department of Education
2006-2009	Reviewer, Kentucky Alternate Assessment Program with the Kentucky Department of Education

Local Level Service

2018-2019	Facilitator, Trauma-informed Care for Educators Learning Collaborative for Bullitt County Schools
-----------	--