


8-1-2017

Yoga and mindfulness in the inclusion classroom

Maria Petruzzelli

Rowan University, petruzzem5@students.rowan.edu

Follow this and additional works at: <http://rdw.rowan.edu/etd>

 Part of the [School Psychology Commons](#), and the [Special Education and Teaching Commons](#)

Recommended Citation

Petruzzelli, Maria, "Yoga and mindfulness in the inclusion classroom" (2017). *Theses and Dissertations*. 2460.
<http://rdw.rowan.edu/etd/2460>

This Thesis is brought to you for free and open access by Rowan Digital Works. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Rowan Digital Works. For more information, please contact LibraryTheses@rowan.edu.

YOGA AND MINDFULNESS IN THE INCLUSION CLASSROOM

by

Maria Petruzzelli

A Thesis

Submitted to the
Department of Interdisciplinary and Inclusive Education
College of Education

In partial fulfillment of the requirement

For the degree of

Master of Arts in Special Education

at

Rowan University

July 24, 2017

Thesis Chair: Sydney Kuder, Ed.D.

© 2017 Maria Petruzzelli

Dedication

This thesis is dedicated to my parents and sister who have given me love, support, and encouragement through my entire graduate school journey. It is because of them I continue to reach my goals and accomplish my dreams.

Acknowledgments

I would first like to thank my co-teacher, Terri Kratz, for her assistance with this project. I am extremely lucky to have worked with you this year and could not have imagined working on this thesis with any other teacher. I enjoyed exploring yoga and mindfulness resources to incorporate into our classroom together. Thank you for having such an open-minded, optimistic approach to our classroom this year!

I would also like to thank my thesis advisor Dr. Sydney Kuder of the Department of Interdisciplinary and Inclusive Education at Rowan University. Dr. Kuder was always available whenever I ran into a trouble spot or had questions about my research and writing. Thank you for your guidance and direction throughout this process.

Finally, I would like to thank my loved ones, friends, and family, for helping me survive the stress of writing this paper and motivating to keep going when I wanted to give up. Your encouraging words and motivation helped me push through to finish this paper. Thank you!

Abstract

Maria Petruzzelli
YOGA AND MINDFULNESS IN THE INCLUSION CLASSROOM
2016-2017

Sydney Kuder, Ed.D.
Master of Arts in Special Education

This paper explores the effectiveness of implementing mindfulness and yoga techniques in two sections of fourth grade inclusion language arts classes. More specifically, this paper examines the effectiveness of yoga and mindfulness techniques on the frequency of off-task behaviors and academic achievement. It was hypothesized that off-task behaviors would occur less frequently and that academic performance in writing would improve after a yoga and mindfulness intervention was implemented.

Using a pre-post no-control design, thirty-six students, eighteen per class, from a public elementary school in Southern New Jersey participated in this investigation. Baseline and post implementation data were collected using On-Demand writing prompts, as well as teacher-made data collection sheets for off-task behavior. Using resources from *Educate 2B!*, Little Flower Yoga, and the Newark Yoga Movement, yoga and mindfulness exercises were taught to students during the first five minutes of class, over an intervention period of four weeks.

This study found that, based on pre-post data, all of the off-task behaviors lessened in frequency in both classes. Additionally, more than half of the students in each class improved their academic performance after the intervention. It was also determined that students could independently use and apply the exercises to other situation. These findings suggest that yoga and mindfulness are potentially promising techniques for improving focus, attention, and academic achievement in the inclusive classroom.

Table of Contents

Abstract	v
List of Tables	viii
Chapter 1: Introduction	1
Research Problem	3
Defining Key Terms	4
Summary	5
Chapter 2: Literature Review	6
Off-Task Behavior	6
Classroom Management Strategies	7
Positive Praise and Attending	9
Self-Management Strategies	11
Student Populations Today	12
Overview of Yoga and Mindfulness	17
Yoga, Mindfulness, and the Brain	20
Yoga and Mindfulness across Education Settings	23
Yoga, Mindfulness, and Attention in Schools	27
Yoga, Mindfulness, and Academic Achievement.....	28
Summary	30
Chapter 3: Methodology	33
Setting and Participants.....	33
Measures	35
Procedure	36

Table of Contents (Continued)

Yoga and Mindfulness Resources.....	40
Variables	42
Chapter 4: Results.....	43
Summary	43
Group Baseline Results.....	44
Intervention	48
Pre-Post Data Analysis	53
General Education Students vs. Students with Disabilities	58
Chapter 5: Discussion	60
Limitations	64
Future Studies	65
Implications for Practice.....	65
Implications for Children with Special Needs	66
Conclusion	67
References.....	69

List of Tables

Table	Page
Table 1. Period 2 Baseline Data of Off-Task Behaviors	45
Table 2. Period 3 Baseline Data of Off-Task Behaviors	45
Table 3. Period 2 Baseline Writing Scores	46
Table 4. Period 3 Baseline Writing Scores	47
Table 5. Period 2 Post Implementation Data of Off-Task Behaviors	49
Table 6. Period 3 Post Implementation Data of Off-Task Behaviors	50
Table 7. Period 2 Post Implementation Writing Scores.....	51
Table 8. Period 3 Post Implementation Writing Scores.....	52
Table 9. Period 2 Frequency of Off-Task Behaviors Pre- and Post.....	53
Table 10. Period 3 Frequency of Off-Task Behaviors Pre- and Post.....	54
Table 11. Period 2 Pre- and Post Implementation Writing Scores	55
Table 12. Period 3 Pre- and Post Implementation Writing Scores	57
Table 13. Students with Disabilities Periods 2 & 3 Off-Task Behavior Frequency	58
Table 14. General Education Students Periods 2 & 3 Off-Task Behavior Frequency	59

Chapter 1

Introduction

When students come to class prepared with their books, writing utensils, and homework assignments, a teacher may think his or her students are prepared and ready to learn. However, when a teacher determines that students are going to be successful on the basis of their external capabilities, he/she does not consider the students' inner thoughts, feelings, or emotions that could cause them to demonstrate off-task behaviors or make limited progression to academic achievement in school. Therefore, in addition to observing students' external capabilities, teachers need to keep in mind what their students are thinking about during instructional time. This can be accomplished by asking the question, "What is going on inside my students' heads while I teach?"

In this non-stop, over-stimulating, technology-based world, teachers are observing students that have a decreased ability to maintain focus, demonstrate more impulsive and off-task behaviors, and use poor management and coping skills. Additionally, teachers are working with increased numbers of students who have experienced or witnessed traumatic events, chronic stress, and severe anxiety from a young age. These issues are impacting and changing the way children's brains are developing. According to Flannery (2017), students' developing brains are being changed due to exposure of traumatic events, specifically, in the areas that control memory retention and emotion regulation. Because of these changes, our students' brains have become adapted to handle stressful situations, but lack the skills needed for educational success and emotional regulation. This can be better understood by examining how the automatic nervous system (ANS) functions in a stressed situation versus a relaxed situation.

The ANS is part of the nervous system that is responsible for control of bodily functions, such as breathing, digestion, and emotional regulation, and is composed of the parasympathetic nervous system (PNS) and the sympathetic nervous system (SNS). If a student experiences stress, anxiety, or traumatic events, he or she activates the sympathetic nervous system, which tells his or her body there is danger. When the SNS activates, it floods the body with adrenaline, initiates the fight or flight response, heightens senses, and shuts down all other systems in the body that are not needed to respond to the dangerous situation. This causes a student to take actions with no rational thinking or reasoning. In contrast, if the parasympathetic nervous system (PNS) is engaged, a student's body is calm and maintains a state of homeostasis, where body systems are relaxed. Over the course of a lifespan, the PNS stays in charge over the body, rather than the SNS. However, when a student is exposed to traumatic experiences and stress at an early age, or at an increased frequency, his or her sympathetic nervous system grows and engages more quickly, making the students feel constantly "on edge" (Harper, 2013). This frequent and quick activation of the SNS can cause long term health problems and affect a child's ability to focus and perform well in school.

The increase in stress and traumatic experiences our students are experiencing has caused a major mental health crisis for schools. According to a report by the U.S. Surgeon General in 2000, one in ten students suffered from a mental health condition that met diagnostic criteria, while one in five suffered from problems that did not meet the criteria, but impaired daily functioning (U.S. Public Health Service, 2000). In more recent research, between the years of 2005 and 2011, thirteen to twenty percent of children living in the United States have experienced a mental disorder in a given year,

and surveillance showed these disorders increasing (Perou et al., 2013). Additionally, Perou et al. (2013) found that in 2010, suicide was the second leading cause of death among children between the ages of twelve and seventeen, which resulted from the interaction of mental disorders and additional factors.

Since mental health issues are increasingly affecting students' daily lives, their abilities to do well in school socially, emotionally, and academically are being impacted. Therefore, it is becoming necessary for teachers to adapt their instructional practices, in order to help students do their best in school mentally and physically. The purpose of this study is to examine and expand research on the effectiveness of implementing mindfulness and yoga techniques into schools. More specifically, the purpose of this study is to examine the effectiveness of implementing mindfulness and yoga techniques into two sections of fourth grade inclusion writing classes.

Research Problem

The three research questions to be answered in this study are:

1. Do fourth grade students with and without disabilities demonstrate off-task behaviors less frequently during writing class after receiving yoga and mindfulness instruction?
2. What are the effects of yoga and mindfulness techniques on academic achievement and writing outcomes of fourth grade students with and without disabilities in writing class?
3. Will the effects of the yoga and mindfulness techniques be maintained when teacher guided instruction and practice is removed?

Elementary school students who attend a public school district in Gloucester County, New Jersey will be instructed in the use of yoga and mindfulness techniques. These students make up two sections of fourth grade inclusion writing classes from a community in Southern New Jersey. The objective of using these techniques in the fourth grade inclusion classrooms is to enable students to improve their self-regulation and become more aware of their thoughts, in order to focus better during instructional time and reach their highest learning potential, mentally and physically. It is hypothesized that the students will demonstrate off-task behaviors less frequently and improve their academic achievement in writing class after receiving yoga and mindfulness instruction and practice. It is further hypothesized that these students will continue to practice yoga and mindfulness techniques, after instruction and practice is given, to independently and automatically self-regulate during writing class.

Defining Key Terms

Mindfulness is the ability to maintain awareness of one's thoughts, feelings, and surrounding environment in the present moment. Although it stems from Buddhist meditation practices, a secular practice of mindfulness has mainstreamed into America in recent years. Practicing mindfulness includes paying attention to one's breathing, using his or her senses to take notice of a surrounding in a conscious moment, and recognizing thoughts and emotions as they are experienced. Yoga, according to the International Association of Yoga Therapists (2012), is the self-inquiry of the body, mind, breath, and emotions. The practice of yoga can be traced back to five thousand years ago in India as a system of techniques for enhancing quality of life. Practicing yoga involves physical movement through a series of specific poses, while controlling the breath.

Summary

Students are demonstrating more off-task and impulsive behaviors, poor management skills, and are having a more difficult time staying focused during learning. Additionally, students are experiencing stress and traumatic events at younger ages. Students that feel unsafe, in danger, or stressed activate their sympathetic nervous system more frequently, causing them to act without rationale thinking. However, when the parasympathetic nervous system is engaged, students' bodies can remain in a state of calmness. All of these factors affect a student's ability to stay on task and reach his or her highest academic potential mentally and physically. Therefore, it is critical that students are taught to self-regulate their thoughts and emotions in the classroom.

In this study, the effects of implementing yoga and mindfulness techniques during two fourth grade inclusion writing classes are examined. Yoga and mindfulness techniques that are used include, exercises from *Educate2B!*, *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance*, and the Newark Yoga Movement. It is hypothesized that after students receive instruction and practice of those mindfulness, movement, and breathing techniques, they will demonstrate off-task behaviors less frequently, require less prompts to stay on task, and have higher writing outcomes during writing class. The goal is that by incorporating mindfulness into the classroom, students will gain the ability to self-regulate and self-reflect on their behaviors, emotions, and awareness of the present moment, in order to re-focus their attention and reach their highest learning potentials.

Chapter 2

Literature Review

Off-Task Behavior

When a student who is actively learning switches his or her attention to a desired distraction, an off-task behavior occurs (Hofer, 2007). The term off-task behavior refers to any activity in a classroom, where a student attends to stimuli other than instruction being provided (Killian, Hofer, Fries, & Kuhnle, 2010). Common off-task behaviors include peer distraction, environment distractions, and self-distractions (Godwin, 2016). According to Hofer (2007), off-task behaviors can be active or passive. An active off-task behavior occurs when a student demonstrates a behavior that disrupts the learning of other students in the class. A passive off-task behavior occurs when a student is disengaged from learning, without disturbing his or her surroundings, such as when a student is daydreaming. The amount of time students demonstrate off-task behaviors is a major problem in educational settings. Off-task behavior can impact the amount of instructional time a teacher has, as well as have a negative impact on a students' academic achievement (Godwin et al., 2016). Additionally, if a single student is off-task or demonstrating disruptive behavior, he or she may affect the learning of the other children in his or her class, in addition to his or her own learning (Perle, 2016). Whether a teacher notices a student demonstrating off-task behaviors or not, a student's achievement is impacted because academic achievement is directly related to the amount of attention a student pays to instructions and information being taught (Hofer, 2007). There have been a large number of studies that examined off-task behaviors in elementary school students. However, many of the prior studies are limited and narrow in scope and focus on small

sample sizes (Godwin, et al., 2016). Additionally, there are a wide variety of reasons a student demonstrates and partakes in off-task behavior. In order to fully address an off-task behavior, not only must the teacher understand where the behavior stems from and for what purpose does it serve, but the student must too. Identifying the source of an off-task behavior is critical because an intervention will successful if it addresses the source of the child's off-task behavior (Godwin, et al., 2016).

Classroom Management Strategies

Classroom management strategies are a critical part in handling off-task behavior. Classroom management is the process by which a teacher creates and maintains appropriate student behavior in a classroom setting. Components of classroom management include instructional and behavioral interactions between students and teachers, the physical classroom environment and what it looks like, the way information is presented and taught, and the assignments and activities that are used to demonstrate learning. All of these components have a direct influence on students' behaviors and academic achievement. Of those components, instructional and behavioral interactions between students and teachers are a key part in successful classroom management. How a teacher responds to a student misbehaving or failing to follow directions sets the tone of the classroom and the instruction that will take place. In a study by Ratcliff et al. (2010), teacher management strategies and their effectiveness on students' time-on-task were examined. Using seventeen second grade and seventeen fourth grade classrooms, data was collected on teacher management strategies during six observations for forty minutes, for a total of four hours of observations in each of the thirty-four classrooms. Additionally, five time-on-task scans were conducted during every observation. The four

strategies examined included teacher normative control, teacher remunerative control, teacher coercion, and teacher retreatism. Teacher normative control was defined as an action in which the teacher asked a student to change his or her behavior. Remunerative control was defined as an action in which the teacher used or manipulated a reward system to control behavior. Teacher coercion was defined as any action in which physical force was used, such as taking away a student's property or freedom. Teacher coercion also included the action of threatening to take away a student's property or freedom. Retreatism was defined as any time a teacher failed to react to a violation of previously known rules that were written or stated by a student.

From the data collected, the researchers found that teachers most frequently used the normative control strategy. More specifically, the teachers used normative interactions and commands, such as "Pay attention," and "Don't do that again." The data collection also showed that remunerative and coercive strategies were used significantly less than normative strategies, indicating that the teachers in this study used little to no reward systems to manage student behavior. In regards to how students interacted with the teachers when behavior management occurred, the study found that as the amount of coercion, retreatism, and normative control increased, the amount of student rebellion also increased, therefore showing that students demonstrate more misbehavior in classrooms where teachers exhibit more behavior-controlling interactions with students. The researchers found this to also be true for time-on-task. As the frequency of teacher management behaviors increased, students' time-on-task decreased. Ratcliff et al. (2010) concluded that a productive classroom climate is more likely to have fewer instances of teacher coercive and normative control strategies. They also concluded that in classrooms

where teachers were on task by asking and answering students' questions, the students were on task. On the other hand, in classrooms where the teacher effort was spent on attempting to control behavior, students demonstrated more unwanted behavioral interactions and spent less time focused on learning.

Effective classroom management strategies are an important part of managing student behavior. However, using these strategies, especially teacher normative control strategies, do not teach students explicitly how to self-regulate or refocus. As a teacher, the ultimate goal is to have students calm down and regain attention independently. This cannot be achieved, however, if students are not given the tools and techniques to do so. When a teacher tells a student to "calm down," he or she doesn't show the student ways to calm down, but rather expects the student to already know how to do so. The same can be said when a teacher tells a student to pay attention. What does it actually mean to pay attention? More importantly, how does a child know how to pay attention if he or she is not given instruction and practice in doing so? Therefore it is necessary that students are explicitly taught how to calm down, express emotions or feelings, and pay attention appropriately, in order to correctly respond to a teacher's behavioral interactions. The use of management strategies in addition to techniques that help children refocus and self-regulate are needed to promote positive behavior.

Positive Praise and Attending

In addition to classroom management strategies, positive attending has been used to manage off-task behavior. According to Perle (2016), positive attending, or positive reinforcement, is the strategic use of labeled praise in response to specific actions. In his review, Perle (2016) notes that there eight key components of positive attending that may

be used for on-task and appropriate performance for students who demonstrate disruptive behaviors as a result of their emotional behavioral disorder (EBD). He also suggests these components can be used as a general management strategy, to improve social interaction and social cues for students with interpersonal difficulties, improve behavior control for students with emotional regulation challenges, and to promote pro-social behavior for students experiencing anxiety or mood difficulties. Perle's eight components of positive attending include: be specific, be immediate, be consistent and frequent, be preventative, praise the opposite, avoid criticism and derogatory feedback, focus on the student's performance, and actively ignore disruptive behavior.

Studies on positive attending and praising students that exhibit on-task behaviors has provided mix-results with pros and cons to its use (Ratcliff et al., 2010). Advantages of using positive attending are that it is a technique that needs little time to implement, is cost effective, requires no preparation, and can be used in combination with other classroom management strategies (Perle, 2016). Additionally, it can be used for a wide range of students and in variety of classroom settings. In fact, several studies have found that giving students effective, evaluative feedback is a teacher task that is positively related to student achievement (Ratcliff et al., 2010). Although it has its advantages, positive attending also has drawbacks. First, proper training using positive attending is not always taught to prospective teachers during their teacher training, which causes this strategy to be underutilized or used incorrectly (Perle, 2016). Secondly, positive attending may not be preferred by students. Based on previous research, there is evidence that receiving positive praise publicly by teachers may be thought of as punishment for some students (Perle, 2016). Additionally, positive attending may be beneficial for many

students but for others, more specific management strategies may need to be used, depending on the severity of their behavior.

While positive attending can help promote appropriate behavior in the classroom, it also has its flaws. As mentioned above, additional strategies may be needed in addition to its use, depending on the behaviors observed. Also, positive attending may be seen as a punishment to some students. Finally, if a teacher uses it incorrectly, even when given training, positive attending becomes an ineffective tool to use. Therefore, teachers are in need of techniques or strategies that are more desirable to students and are easy to implement.

Self-Management Strategies

Another method that has been used to manage off-task behavior in the classroom is the use of a self-management program. In a self-management program, a student uses self-reinforcement, self-monitoring or recording, self-evaluation, and, or, goal setting in order to diminish disruptive behaviors (Dalton, Martella, & Marchand-Martella, 1999). Self-management programs and their effectiveness in the classroom setting have been examined in prior research. However, there is little information on the generalization of newly acquired behavior with students who exhibit behavior problems. Therefore, Dalton, Martella, and Marchand-Martella (1999) conducted a study to determine the effects of a self-management program in reducing off-task behavior of two eighth grade students with learning disabilities and attention deficits. Using a self-monitoring form, a “before class, during class, and after class” checklist, and teacher evaluations, the students had to self-monitor their behavior in three different classroom settings and discuss their ratings with their teachers.

Based on the data collected, the researchers found the self-management program to be effective in reducing off-task behavior. Additionally, the students improved in academic performance and increased their work productivity. Although there were positive outcomes from the study, there were also drawbacks. First, the study focused on two students with special needs, thus providing no insight on the effectiveness of using self-management programs with typically developing students. In fact, Dalton, Martella, and Marchand-Martella (1999) note in their review of literature that while self-management strategies have been found to be effective in increasing on-task behavior and academic performance for children in special education settings, there is a lack of research on the effectiveness of using them with students in general education classrooms. Secondly, through the use of a self-management system, only specific, target behaviors are addressed. Therefore, any behaviors other than those being targeted are not corrected. Because of these drawbacks, there is a need for strategies that can be applicable to both special and general education students over a variety of settings that address any off-task behavior observed by teachers.

Student Populations Today

The reality for educators and school professionals today is that students are stressed, anxious, and some even show signs of mental health issues. In an NPR Education series on mental health in schools, Anderson and Cardoza (2016) found that up to one in five children living in the United States shows signs or symptoms of a mental health disorder in a given year. Of those children, eighty percent do not receive the mental health services they need, which affects their attendance, academic achievement, and behavior in the classroom (Anderson & Cardoza, 2016). Also, more than half of all

children with mental illnesses show symptoms before they turn fourteen (Cardoza, 2016). Additionally, teachers are working with students who have experienced or witnessed trauma from a young age. Researchers have estimated that between ten and twenty percent of children in the United States are exposed to domestic violence each year and that the repercussions resonate in the classroom (Emanuel, 2016). Finally, education professionals are more frequently working with students who have specialized learning needs. According to the Centers for Disease Control and Prevention (CDC), since the late 1990s, there has been a seventeen percent increase in the proportion of children and teens in the United States that have a developmental disability (Gardner, 2011). Because of these reasons, as well as others mentioned below, teachers, administrators, and other educational professionals are observing and working with students that have a decreased ability to maintain focus, demonstrate more impulsive and off-task behaviors, and use poor management and coping skills.

The school setting and environment today has become over-whelming and stressful for students both with and without disabilities. From the moment students enter school in the morning, until the time they leave, children experience an overload of structure and rules. The teachers and adults tell them where to sit, when to speak, and what they will do for most of their day (Goldberg, 2013). Additionally, students in the upper elementary grades, middle school, and high school, lack a space to feel grounded or situated, as they are frequently in a rush to transition from one classroom to another. This movement from one class to class in noisy hallways from children yelling, voices over the loudspeakers, and bells ringing, can cause sensory overload and even anxiety.

In addition to the structure and rules, education professionals require students to follow high demands and expectations. All students, including those with disabilities, are expected to keep up with the increasing expectations placed upon them on a daily basis, which most struggle with (Morgan, 2015). Broderick and Metz (2009) note that contemporary education reforms have placed these skills and knowledge demands and expectations on students as a way to prepare them for the global economy they will enter. However, when adults and educators place these demands, expectations, and rules on students, they take away their opportunities to deny their instincts, feelings, and emotions (Goldberg, 2013).

When examining demands and expectations placed on students, one can see that there is an increasing emphasis on high-stakes testing and academic achievement. These contemporary reforms, as Broderick and Metz (2009) have mentioned, have contributed to the huge rise in high-stakes testing and an increase in competitive educational environments, which now causes schools to function under pressures. More importantly, these pressures to do well in school are starting at an early age by both school professionals and parents (Goldberg, 2013).

Along with the demands and structure placed on students in the school environment, students are being exposed to stress, anxiety, and traumatic experiences. In the United States, one in four students will witness or experience a traumatic event before age four and more than two thirds by age sixteen (Flannery, 2017). Although adults do not always realize it, children are often burdened with anxiety and stress and have very little ability to make changes to the things that make them stressed and anxious (Harper, 2013). Often times this inability to make changes to the things are stressful stems from

the students' home environments and communities, in which they have traumatic experiences. Jennifer Harper, founder of Little Flower Yoga (2013) notes that children are exposed to too much of life's unpleasantness, and therefore are very aware of tensions between their parents, have concerns about their homes and families, and have fears of personal harm. Students that live in violent neighborhoods or unsafe housing or who lack the resources to have their basic needs meet are especially stressed (Napoli, Krech, & Holley, 2005).

Finally, children are living in a technology-based, over stimulating world that never seems to stop, making them sleep deprived and exhausted. Technology, such as smart phones, tablets, video games, television, and computers are in the hands of children constantly, for long periods of time. The excessive stimulation from technology and electronic devices reduces the amount of time in which children can relax, imagine, and play. All of these aspects affect their levels of anxiety, sleep, and behavior (Goldberg, 2013). In addition to technology that is over-stimulating for children, certain environments can contain too much stimuli. According to Harper (2013), children that live in urban environments filled with loud noises, bright lights, and chaotic situations can become overwhelmed and fatigued.

For children with specialized learning needs, the factors mentioned above may only be part of the reasons they experience stress, frustration, and anxiety. Children with emotional behavioral disorders are especially vulnerable to stress because their world is marked by fear, uncertainty, poor impulse control, and anxiety about change, which adversely affects their school performance (Goldberg, 2013). Students with learning disabilities often have levels of anxiety and school-related stress that are higher than

those of their non-disabled peers (Beauchemin, Hutchins, & Patterson, 2008). Children diagnosed with ADHD are increasingly sensitive to overstimulation and stress, which is not a choice but rather an uncontrollable feature of their nervous systems that can impact their ability to focus and maintain emotional balance (Harper, 2013).

Structure, high demands and expectations, stress, exposure to traumatic experiences, frustration, and exhaustion all deny students the ability to be children. All of these factors also cause students to feel unsafe. Most importantly, these factors are impacting and changing the way children's brains are developing. According to (Flannery, 2017), students' developing brains are being changed due to exposure of traumatic events, specifically, in the areas that control memory retention and emotion regulation. Because of these changes, our students' brains have become adapted to handle stressful situations, but lack the skills needed for educational success and emotional regulation. According to McEwen, Eiland, Hunter, and Miller (2012), stressful experiences in early life can cause long-term and permanent changes to the brain. In their review of literature, they found that stress hormones can change the structure of neurons and remodeling in the brain. Additionally, they found that chronic stress can diminish the size of the dentate gyrus and cause structural changes to the prefrontal cortex and amygdala, three main parts of the brain that are involved in managing stress. The researchers concluded that when stress is experienced at an early stage in life, the brain development and capacity to respond to later, stressful experiences are negatively affected. The effects of stress and how one's brain and body respond during a stressful or traumatic experience are explained in detail later on.

Overview of Yoga and Mindfulness

Yoga stems from a physical and spiritual practice that was developed in Ancient India thousands of years ago. The word Yoga is defined as “union” or “connection,” which originates from the Sanskrit root, “yuj”. This definition signifies the connection of the mind, body, and spirit (Salmon, Lush, Jablonski, & Sephton, 2008).

The earliest guidebook on yoga is the *Yoga Sutras*, in which the science and philosophy of yoga is summarized in Sanskrit. The guidebook was written by Patanjali, an Indian scholar, over two thousand years ago (Goldberg, 2013). Prior to this resource, the science and philosophy of yoga had been passed down from master to student orally for at least five thousand years. According to the *Yoga Sutras*, there are eight limbs of yoga, or eight aspects of yoga practice, all of which are of equal importance. All of the eight limbs are interconnected, representing things a person can do to become aware of him or herself and of the world in which he or she lives in (Silas & Goodney, 2003). The eight limbs include the yamas, niyamas, asana, pranayama, pratyahara, dharana, dhyana, and samadhi. The yamas and niyamas are guidelines for interacting with the world and are the foundations of a yoga practice (Harper, 2013). The asanas are the many different body positions one must hold during yoga practice. Asanas are what most people think of when they hear the word yoga (Silas & Goodney, 2003). Yoga practices in Western contexts focus on sequences of asanas, or positions, which are only one principle in the yoga sutras by Patanjali (Salmon et al., 2008). Pranayama is the practice of breath control in yoga (Levin-Gervasi, 1999). In yoga, pranayama is practice simultaneously with the asanas to help bring awareness of the breath, as well as to move in a fluid motion through the positions. Harper (2013) notes through practice changing the pace, rhythm, and

patterns of our pranayama, or breath, there may be changes to our energetic state, increases in our energy, or increases in our sense of calm. The last four limbs, pratyahra, dharana, dhyna, and Samadhi, are the gradual steps to complete meditation (Silas & Goodney, 2003). When all eight of these aspects are practiced, an individual can achieve higher levels of self-awareness, wellness, and inner peace (Harper, 2013).

Mindfulness, also known as mindfulness meditation, is a specific type of meditation, in which the goal is to focus on the current moment, in a nonjudgmental way, which brings one's awareness to the present. This definition comes from John Kabat-Zinn, the founder of Mindfulness Based Stress Reduction (MBSR), who has provided a growing movement of mainstreaming mindfulness into institutions in our society such as hospitals, schools, higher education, corporations, prisons, etc. The MBSR program has become one of the most studied forms of meditation on the Western hemisphere and has shown positive outcomes for a variety of populations that have used it (Harper, 2013). The goal of mindfulness-based practices, such as MBSR, is to bring one's awareness to the thoughts and feelings as they come into one's mind, without becoming reactive to them (Bostic et al., 2014). Often times, mindfulness and meditation are seen as relaxing. However, because an individual notices senses, thoughts, and emotions during meditation, his or her brain is not at rest and therefore, it cannot be considered relaxation. In fact, the word meditation comes from the Latin word, *meditari*, which means to participate in deliberation or contemplation (Marchand, 2014).

Yoga and mindfulness can be seen as separate entities, in which an individual practices them separately. However, that is not actually the case. Yoga is an opportunity to practice mindfulness (Salmon et al., 2008). Additionally, yoga is also one of the three

practices that form the MBSR core program, along with sitting meditation and the body scan exercise (Salmon et al., 2008). Therefore, the goals of yoga are identical to the goals of mindfulness meditation. Even though mindfulness has its own teachings and practices, it is a crucial part of yoga, particularly ashtanga yoga, or the Eight-Limbed Path (Harper, 2013).

Although yoga and mindfulness stem from Buddhist and Hindu practices of the East, they are secular, or non-religious, and have increasingly mainstreamed into America in recent years. In fact, yoga and mindfulness are continuing to grow and become an important part of the United States' healthcare and culture. Today, more than twenty million Americans practice yoga and mindfulness and for many reasons (Fishman, 2014). This could be due to the many benefits yoga and mindfulness provide. Botstic et al. (2014) note that for adults who practice mindfulness, there can be a decrease in anxiety, depression, chronic pain, binge eating, stress, etc. Also, yoga can afford benefits such as cardio, respiratory, and circulatory health, mental relaxation, body position and movement awareness, and flexibility (Levin-Gervasi, 1999). Both yoga and mindfulness are also healing alternatives to traditional modalities associated with common medical conditions such as back pain, insomnia, Restless Legs Syndrome, headaches, etc. (Fishman, 2014). As a result of its increasing popularity in the West, yoga and mindfulness have become a growing focus in clinical research (Salmon et al., 2008).

One domain of yoga, in particular, that has begun receiving increasing attention in clinical research is the application of yoga and mindfulness with children and youth in educational settings (Felver & Jennings, 2015). Mindfulness and yoga can be valuable to

help students be more successful learners and to make them more connected members of a school community (Leland, 2015).

Yoga, Mindfulness, and the Brain

In order to respond to the things around him or her, an individual uses his or her whole nervous system, which can be broken up into two parts. The first part is the automatic nervous system. The human body responds to the environment through the nervous system (Goldberg, 2013). The automatic nervous system (ANS), more specifically, is the part of the nervous system that is responsible for control of bodily functions such as breathing, digestion, and emotional regulation. The ANS composed of the parasympathetic nervous system (PNS) and the sympathetic nervous system (SNS).

If a student experiences stress, anxiety, or traumatic events, he or she activates the sympathetic nervous system, which tells his or her body there is danger. When the SNS activates, it floods the body with adrenaline, initiates the fight or flight response, heightens senses, and shuts down all other systems in the body that are not needed to respond to the dangerous situation. For intense, but brief bouts, these changes notify the body to be in survival mode (Goldberg, 2013). When the body goes into survival mode, it causes the student to take actions with no rational thinking or reasoning. This process in which the sympathetic nervous system takes control has been studied very closely in relation to yoga and mindfulness.

In contrast, if the parasympathetic nervous system (PNS) is engaged, a student's body is calm and returns to a state of homeostasis, where body systems are relaxed. The PNS is engaged after a crisis occurs through hormonal signals, which cancel the stress response and returns the body back to normal (Goldberg, 2013). Over the course of a

lifespan, the PNS stays in charge over the body, rather than the SNS. However, when a student is exposed to traumatic experiences and stress at an early age, or at an increased frequency, his or her sympathetic nervous system grows and engages more quickly, making the students feel constantly “on edge” (Harper, 2013). This frequent and quick activation of the SNS can cause long term health problems and affect a child’s ability to focus and perform well in school.

The second part of the nervous system that is used to respond to emotions and the environment is the limbic system. The limbic system is a group of structures, nerves, and networks in the brain that are responsible for our emotions, reflexes, instincts, and basic functions. Two main structures within the limbic system are the hippocampus and the amygdala. The amygdala is the part of the brain that reacts instantly to fear or strong emotions and the hippocampus is involved in the formation of memory (Goldberg, 2013). When the amygdala reacts, it bypasses the prefrontal cortex, which is the part of the brain involved in planning, thinking, and executive functioning, and sends signals to the hippocampus to record memories. The limbic system is found in the lower part of the brain and is often called the *primitive* brain because it is one of the oldest parts of the brain, which is almost fully developed when an individual is born (Harper, 2013). Dempsey (2017) refers to the limbic system as the reptilian brain and notes that it feeds on negative energy, such as ridicule, name calling, and harsh tones. The limbic system has also been referred to using other names as well. According to Morgan (2015), when our inner environment does not feel safe, secure, accepted, or calm, the “emotional brain” takes control. Harper (2013) refers to the limbic system as the “protective brain” in her book, *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child*

Improve Attention and Emotional Balance, because it is always looking out for safety and immediate happiness. Regardless if it is referred to as the “reptilian brain,” “emotional brain,” or any other name given to it, the limbic system’s main role is to reach safety and happiness immediately. In order to achieve immediate happiness and safety, the use of reasoning, planning, and thinking, provided by the prefrontal cortex, is overlooked, causing an individual to take thoughtless actions.

Through studies on the relationship between yoga and mindfulness and the brain, researchers have found positive outcomes. For example, yoga and mindfulness have been found to improve immune function, neural integration, and brain development. According to Salmon et al. (2008), yoga can help balance the responsiveness of stress and alleviate hyper-activation of the sympathetic nervous system. Additionally researchers have noted that yoga can enhance and improve the parasympathetic nervous system through slow movement patterns that reduce one’s heart rate and blood pressure. Dr. J. Siegel, a mindfulness expert and clinical professor of psychiatry at the UCLA, found that through the practice of mindfulness, an individual can disengage from old habits of neural firing and trained emotional responses to stress, such as anxiety and depression, and change patterns of activity in the brain. When mindfulness or yoga is practiced repetitively, an individual learns to detect different streams of awareness, which can alter the directional flow in which information is processed. This, in return, allows the individual to use focus of the mind to change the structure of his or her brain (Siegel, 2007).

In addition to these positive findings, Marchand (2014) conducted a review of literature which revealed strong evidence that mindfulness impacts parts of the brain.

Using the keywords, mindfulness and neuroimaging, mindfulness and fMRI, mindfulness and MRI and mindfulness and mechanisms, meditation and neuroimaging, meditation and fMRI and meditation and MRI, 248 research abstracts were found. Of those studies found, those with the most relevance were used and analyzed to better understand the association between mindfulness meditation and neural processing. From this review, Marchand found that there were many cognitive and emotional benefits of mindfulness practice. One finding that stood out was that in many of the studies used, mindfulness practices decreased the activation of the amygdala and increased the activation for the prefrontal cortex. Additionally, structural imaging studies that were reviewed matched these findings and indicated there were changes in the hippocampus. Finally, Marchand (2014) found that there were decreases in anxiety and depression symptoms and reductions in negative emotions from the use of mindfulness meditation.

Yoga and Mindfulness across Education Settings

By understanding the populations of students education professionals are working with in schools, as well as how these students' brains are functioning, one can see that there is a need for intervention in schools. The increase in stressful and traumatic experiences that students are experiencing has caused a major mental health crisis for schools and the education professionals who work with these students. More importantly, schools are increasingly appointed to manage students' social and emotional needs because their needs are impacting their academic abilities (Broderick & Metz, 2009). According to a report by the U.S. Surgeon General in 2000, one in ten students suffered from a mental health condition that met diagnostic criteria, while one in five suffered from problems that did not meet the criteria, but impaired daily functioning (U.S. Public

Health Service, 2000). In more recent research, between the years of 2005 and 2011, thirteen to twenty percent of children living in the United States experienced a mental disorder in a given year, and surveillance showed these disorders increasing (Perou et al., 2013). Additionally, Perou et al. (2013) found that in 2010, suicide was the second leading cause of death among children between the ages of twelve and seventeen, which resulted from the interaction of mental disorders and additional factors.

Although research on yoga and mindfulness is still in its beginnings, emerging research is discovering that mindfulness and yoga yield diverse benefits for children across school settings. In a literature review by Leleand (2015), primary and secondary sources related to mindfulness and education were researched. The keywords that were used were mindfulness, mindfulness and education, mindfulness and learning, mindfulness and school, mindfulness and learning disabilities, and mindfulness and ADHD. The findings found a plethora of research on mindfulness' effects on particular factors that affect student success. The specific attributes that were found in scholarly articles and included in the literature review included, learning skills and academic performance, critical thinking skills, behavior and self-control, job-specific development, applications for students with learning disabilities, impact on bullying in schools, and athletics and coaching. Of the articles found and analyzed, mindfulness education appeared to have a positive impact on academic performance. More specifically, mindfulness education helped students, including those with disabilities, focus, be more organized, perform better on exams, and think critically. From this literature review, one can see that mindfulness instruction is relevant to the education system. Additionally, this literature review noted that research on mindfulness education could be useful at all ages

and grade levels from elementary school through graduate and professional degree programs.

Broderick and Metz (2009) examined the effectiveness of Learning to BREATHE, a classroom mindfulness curriculum for adolescents. At the time, there had been no school-based mindfulness curricula for adolescents reported in scholarly literature. Therefore the researchers hoped to examine its importance for the facilitation of emotional regulation skills and well-being of the general adolescent population. In the study, one hundred twenty seniors from a private high school for girls in Pennsylvania participated in the six session Learning to BREATHE program, as a part of their health curriculum. The sessions were delivered for approximately thirty five minutes, twice a week by the primary researcher. This study made several important findings. First, the data analysis concluded that the participants in the mindfulness program reported reductions in negative affect and increases of feelings of calmness, relaxation, and self-acceptance, compared to the control group, which consisted of thirty juniors who did not receive the program. Second, the high school seniors reported they experienced a greater awareness of their feelings and an increase in emotion regulation. Finally, the students in the treatment group reported significant reductions in tiredness from a pre- and post-test. The findings of this pilot study imply that the implementation of a mindfulness program can promote emotional regulation, reduce stress, and develop the attention of adolescents, as well as students across age ranges.

Schonert-Reichl and Lawlor (2010) conducted a study to examine the effectiveness of a mindfulness education program on the optimism, self-concept, positive affect, and social-emotional functioning of pre- and early adolescents in school. A second

purpose of their study was to assess the fidelity and acceptability of a mindfulness education program in a real school setting, where regular elementary school teachers delivered the instruction to the students. Two hundred and forty six students in fourth through seventh grade participated in the study and were randomly placed in the experimental or control group. Students in the experimental group received mindfulness education once a week for about forty to fifty minutes by their respective classroom teachers. The mindfulness education program also consisted of core attention exercises that were completed three times a day for three minutes each. From this study, the researchers found that the students that received the mindfulness education program made improvements in optimism. More importantly, this study concluded important results about the fidelity and acceptability of a mindfulness education program. Based on teacher reports, all of the teachers that implemented the mindfulness education program expressed that the program and instruction were easily embedded into their required curricula across subjects. Additionally, results from the teachers' perceptions of the ME program indicated that the teachers felt the program was both effective and beneficial to their students. Third, the teachers reported that they believed the mindfulness education program would significantly influence their students their students' social-emotional skills in the classroom. These results imply that the teachers implemented the program with high favorability and fidelity. Additionally, these results suggest that if implemented in other classrooms, the same results of fidelity, favorability, and effectiveness could occur.

Yoga, Mindfulness, and Attention in Schools

One aspect that has been especially researched in regards to yoga and mindfulness in schools is attention. In a study by Crescentini, Capurso, Furlan, and Fabbro (2016), sixteen children, ages seven and eight years old, were given mindfulness-meditation training in a primary school in Northeast Italy. In the study, the students were placed into two groups, a control group and a mindfulness-oriented meditation (MOM) training group. The training took place over a period of eight weeks, in which the students were instructed by two mindfulness-meditation instructors. The instructors of the MOM training group taught the students meditation exercises that focused on three specific activities. They were mindfulness of breathing, mindfulness of body parts, and mindfulness of thoughts. The students in the control group completed an activity in which they read and commented on chapters in the book: *Six Pixies in My Heart*. After eight weeks of mindfulness-oriented training, the researchers found that, based on the teacher's reports, the students' attention problems reduced.

Napoli, Krech, and Holly (2005) found similar outcomes. In their study nine classrooms within two elementary schools in a U.S. Southwestern city were used to examine whether the participation in a mindfulness program affected first, second, and third grade students' outcomes on measures of attention. For the study, two hundred and twenty eight students in grades one, two, and three were randomly placed in an experimental group, which received mindfulness training, or in a control group. The study took place over a period of twenty four weeks, in which twelve bi-monthly Attention Academy Program trainings were given to the experimental group, at which time the students in the control group participated in quiet activities, such as reading. To measure

the experimental group's outcomes, the ADD-H Comprehensive Teacher Rating Scale (ACTeRS), Test Anxiety Scale (TAS), and the Test of Everyday Attention for Children (TEA-Ch) Selective (visual) Attention Measure sub-test and Sustained Attention Measures sub-test were used. The results of this study found that there were significant changes of scores differences between the control group and the experimental group. The results ACTeRS sub-tests showed that the students in the experimental group that were given mindfulness training had lower scores, indicating fewer problems reported by the teachers. Additionally, the results of the TEA-Ch test showed that the experimental group had higher selective attention scores, indicating an increase in ability to pay attention.

Additionally, Peck, Bray, Kehle, and Theodore (2005), conducted research to investigate the effectiveness of yoga as an intervention for improving on-task behavior of children with attention problems. In the study, ten elementary school students, ages six through ten, participated. Of the ten participants, none were diagnosed with ADHD, but had demonstrated "time-on-task" for less than eighty percent of the time. The students were given yoga intervention, in which they watched a yoga videotape by Gaiam. The students followed adult instructor on the videotape for 30 minutes, twice a week, for three weeks. The researchers collected observations using a structured Behavioral Observation Form (BOF) every ten minutes. The findings showed yoga improved compliance and attention for children with attention problems.

Yoga, Mindfulness, and Academic Achievement

The relationship between academic achievement and yoga and mindfulness has also been studied by researchers. In a special issue by Felver and Jennings (2015), two previous literature reviews on mindfulness-based interventions in school settings were

analyzed. In the first literature review, a study by Bakosh et al. (2016) found that ten minutes of daily mindfulness practice improved elementary students' academic achievement. Similarly, in the same review, Singh et al. (2016) found that individualized mindfulness training improved students' academic achievements in mathematics. Additionally, this study found that students' engagement levels improved after being given individualized mindfulness interventions.

Beauchemin, Hutchins, and Patterson (2008) also studied the relationship between mindfulness meditation and academic performance. However, their study focused on students with learning disabilities. Thirty-four participants with a primary diagnosis of learning disabled, ranging from age thirteen through eighteen, from four classes in a private school in Vermont were recruited for the pilot study. Using a pre-post no-control design, the participants received meditation intervention sessions for five to ten minutes at the beginning of each class period. The study took place five days a week for five consecutive weeks. Three measures were used to analyze the results. They were the Social Skills Rating System (SSRS), The State-Trait Anxiety Inventory (STAI), and attitudinal questions, which required students to complete informal, anonymous post-intervention questionnaires. There were a few important results from this study. First, the students reported significantly decreased levels of anxiety. Secondly, on the basis of students' and teachers' reports, students demonstrated improvements in social skills. Finally, according to teacher ratings, the students improved academic performance after mindfulness meditation.

Summary

Yoga is the connection of the mind, body, and breath in which an individual flows through a variety of asanas, or postures, that are synced with their breathing. Mindfulness is the intentional focus on feelings, thoughts, and behaviors in a present moment, without applying judgment. Yoga and mindfulness practices have been around for thousands of years. However, their benefits are still in the emerging stages of exploration in Western culture. Over the past few decades, yoga and mindfulness have grown to be a crucial part of American healthcare and culture. These practices have been proven to aid anxiety, depression, chronic pain, respiratory and circulatory health, and common medical conditions, to name a few. Additionally, yoga and mindfulness have been used as alternatives to common medical treatments. Because of the many benefits yoga and mindfulness provide, there has been an increase in scholarly research on their effectiveness. One particular aspect that is increasingly being studied is yoga and mindfulness for school-aged children.

Today researching the effects of yoga and mindfulness in educational settings has become critical. Teachers and education professionals are observing and working with a growing population of school-aged children that suffer from social, emotional, and behavioral problems, which interfere with their school success (Schonert-Reichl & Lawlor, 2010). Children are under a great amount of stress and pressure both at home and at school, experience or witness traumatic experiences at young ages, and suffer from exhaustion due to overstimulation. For students with special needs, stress, frustration, and anxiety from these factors may be heightened. Because of these issues, there has been a rise in childhood mental health problems. Since academic success, both physically and

mentally, are being affected, schools are now compelled to address this widespread problem (Napoli et al., 2005).

Although research on yoga and mindfulness in schools is still in its early stages, studies and scholarly journal articles have provided evidence that there are a variety of positive outcomes from implementation of yoga and mindfulness programs and activities into school curricula. Through analysis of present literature, implementing yoga and mindfulness in schools has improved students' social skills, emotional regulation, and anxiety. There has also been research to support that yoga and mindfulness practices increase students' self-acceptance. Additionally, studies have concluded that yoga and mindfulness instruction can improve students' abilities to focus and to pay attention. Other research has shown a positive correlation between the implementation of yoga and mindfulness and academic performance for children with and without disabilities. Finally, the present literature available has demonstrated the feasibility and acceptability of implementing yoga and mindfulness programs into a wide range of school settings.

Providing students, disabled and non-disabled, with strategies to help them refocus and self-regulate in school are becoming an increased responsibility of education professionals. Yoga and mindfulness exercises are powerful tools that can be implemented into school curricula, across many grade levels. Additionally, these exercises take little time to implement and practice. Therefore, the benefits of using yoga and mindfulness practices in the classroom can outweigh the cons. The goal is to teach and practice yoga and mindfulness skills with students so that they may apply these tools to any stressful situation in any setting during their childhood, as well as their adulthood. Individuals carry the patterns they learn as children into adulthood. Therefore

incorporating yoga and mindfulness tools into the classroom is an integral part of effective teaching (Napoli et al., 2005). The purpose of this study is to build onto the previous, limited research that supports the implementation of yoga and mindfulness practice in inclusion educational settings to improve the frequency of on-task behaviors and academic achievement. Additionally, the purpose of this study is to examine if, when given instruction and practice with yoga and mindfulness exercises, students will independently self-regulate and refocus their attention in school.

Chapter 3

Methodology

Setting and Participants

This study took place in a fourth grade inclusion language arts classroom in an elementary school in Southern New Jersey. The course covered fourth grade writing using the *Being a Writer* curricula, as well as spelling practice, in which the *Spelling Connections* program was used. During the time of the study, students focused on poetry, grammar workshops, and spelling lists in the writing classes.

For this study there were two intervention groups. The first intervention group consisted of eighteen students, three of which were classified with disabilities. One of these students was classified Specific Learning Disability, one was classified Other Health Impaired, and one was classified Communication Impaired. Specific Learning Disability is defined as a disorder in one or more of the basic psychological processes involved in understanding language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Other Health Impaired is defined as having limited strength, vitality, or alertness, including heightened alertness to environmental stimuli, which results in limited alertness with respect to the educational environment that is due to a chronic or acute health problem and adversely affects a child's educational performance. Communication Impaired can be defined as an impairment that impairs the ability to transmit or receive ideas, facts, feelings, and desires and may involve language or speech or both, including hearing, listening, reading, or writing. Communication disorders may range in severity from mild to profound. The students with disabilities in this study were

identified with these classifications in their Individual Education Programs, also known as IEPs, which were written by the school district. In each IEP, students had goals and objectives that needed to be met in regards to language arts and writing.

There were eight male students and ten female students. Of the eight male students in the first intervention group, all were White. Of the ten females in this group, six were White and four were African American.

The second intervention group consisted of eighteen students, one of which was classified as Autistic. Autism is defined as a developmental disability that significantly affects verbal and nonverbal communication and social interaction that adversely affects a child's educational performance and is generally evident before age three.

Characteristics that are often associated with autism are stereotyped movements, engagement in repetitive activities, resistance to changes in routines and environments, and unusual responses to sensory experiences.

There were eight male students and ten female students in this intervention group. Of the eight male students in the second intervention group, two were Asian, three were African American, and three were White. Of the ten females in this group, one was African American, one was Asian, and eight were White.

In each inclusion classroom there was a general education teacher, as well as special education teacher. During the writing class, the students in both inclusion classes were seated in rows of three facing the white board that is located in the front of the classroom. There were rows on the left and right side of the room, with open space in the middle for the students and teachers to move through.

Measures

To measure the frequency of off-task behaviors, a data collection sheet was created by the general and special education teacher of the writing classroom. The data sheet contained each student's name and the off-task behaviors that had been observed in the classroom. Five specific off-task behaviors the teachers selected were: students' body posture, which included leaning on the desks and sitting on their feet, fidgeting/playing with writing utensils and materials, talking during instruction time, lack of eye contact, and inability to stay seated. Using the data sheet and a silent timer, the teachers documented off-task behaviors every five minutes. This data sheet was used both before and after the intervention to collect pre-post data.

To measure writing students' writing quality, students were given an On-Demand writing prompt before and after implementation, both of which were scored using the five point New Jersey Registered Holistic Scoring Rubric. In an On-Demand writing prompt, students must complete a finalized draft of a writing piece in a single writing session after their teacher briefly goes over the directions of the prompt and sets a visible timer. Depending on a school district's procedures, students may be given anywhere from ten minutes to an hour to complete the writing task. On-Demand writing can cover a variety of styles including narrative, opinion, and informative/explanatory, allowing students to prepare for realistic writing experiences in adulthood. Therefore, the goal of using On-Demand writing tasks is to have students practice drafting, editing, and finalizing writing pieces within one sitting. Through the use of On-Demand writing tasks, teachers are also able to see if the students are grasping the new material taught during writing instructional time.

As mentioned above, the On-Demand writing tasks were scored using the five point New Jersey Registered Holistic Scoring Rubric. This rubric provides teachers with a scoring method and criteria to evaluate students' work in way that is uniform and consistent. The rubric focuses on four main features of writing. These include content/organization, usage, sentence construction, and writing mechanics. For any given writing task, these features serve as indicators as to how well the writer responded to the task given. Using the NJ Registered Holistic Scoring Rubric, pre-determined features are provided with descriptions that vary for different point values, which describe levels of writing proficiency. A student that creates a written response that is off topic, written in the wrong format, provides no response, or is not in English receives a Non-Scorable, which is translated to a zero. A score of a one represents an inadequate command of the written language. This means that a students' writing lacks an opening and/or closing, provides a minimal response to the task, is disorganized with little planning, provides details that are random and barely apparent, and has severe errors to usage, sentence structure, and mechanics. A score of a five represents a strong command of the written language. A student that scores a five provides an opening and a closing, has a single focus with a sense of unity and coherence, presents ideas in a logical sequence, provides details that are appropriate and varied, and has few to no mistakes in usage, sentence structure, and mechanics. Additionally, students are able to score half points, such as a score of 3.5.

Procedure

Prior to the implementation in the classroom, the main researcher (special education teacher) attended yoga and mindfulness workshops and trainings. One

workshop was called Educate 2B!: Tools for Engaged Learning and Living. This all day training provided education professionals with a manual of yoga and mindfulness exercises that could be used in the classroom, as well as training on how to use and adapt them. Additionally, the main researcher attended a web conference called, Yoga and Mindfulness Tools for Children, which was presented by PESI. This web conference provided educators and professionals information on how to implement yoga and mindfulness techniques with children, using Jennifer Cohen Harper's book, *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance*. Additionally, the main researcher and her co-researcher (general education teacher) attended the 2017 Yoga and Mindfulness in New Jersey Schools Symposium that was held at Rowan University. This all day training provided attendees a variety of breakout sessions on yoga and mindfulness topics. The researchers attended *Learning How to Make Everyone a Winner in You School and Classroom* by Newark Yoga Movement, *Supporting Special Needs Students On and Off the Mat* by Allison Morgan, *One School's Journey to Mindfulness and Yoga in the Classroom* by Mary Pat Kochenash and Dana Schlieder, and *Less Stress and More Focused Learning: Yoga & Mindfulness Breaks in the Classroom* by Allison Morgan. The main researcher completed all of the training workshops over the course of three full school days, while her co-researcher spent one full school day training in yoga and mindfulness at the symposium.

After attending trainings on implementing yoga and mindfulness in the classrooms, the researchers selected activities and curricula they wanted to use in their fourth grade inclusion writing classes. Additionally, they decided when during class to implement yoga and mindfulness techniques, as well as the duration of time they would

spend on them in a class period. The researchers decided to use a combination of techniques from *Educate 2B!*, Little Flower Yoga, and Newark Yoga Movement. They also decided to implement yoga and mindfulness strategies in during the first five minutes of class as way to settle in from switching classes and to prepare to focus attention on the writing lesson.

The intervention began by having the two teachers in the class collect pre- or baseline data using the data sheet described above. The sheet contained each student's name and the off-task behaviors that had been observed in the classroom. The teachers collected data every five minutes on students' body posture, fidgeting or playing with writing utensils and materials, talking during instruction time, lack of eye contact, and inability to stay seated. Every five minutes, any student demonstrating an off-task behavior would receive a dash by their name on the checklist. This occurred daily in each of the sections of writing class for the duration of the pre-implementation period. At the end of the pre-implementation period, the teachers counted and totaled the frequency of off task behaviors for each child and for each whole class.

Additionally, prior to implementation, students were given an On-Demand writing prompt to measure baseline writing quality. In an On-Demand writing prompt, students must complete a finalized draft in a single writing session after their teacher briefly goes over the directions of the prompt and sets a visible timer. The general and special education teachers went over the directions of the prompt with the students and set a timer for forty-five minutes. Students used the On-Demand directions sheet to brainstorm ideas for five minutes and then typed their pieces on laptops with the

remaining forty minutes. Using the NJ Registered Holistic Scoring Rubric, both teachers read through the students' On-Demand writing pieces and scored them from zero to five.

After pre-implementation data was collected for a week using the teacher-made data collection sheet and the baseline On-Demand writing was completed, the teachers began to implement yoga and mindfulness instruction and practice with their inclusion writing classes. For each different yoga or mindfulness exercise taught, there were different directions. However, to begin the exercises, the teachers had the students find their way into a "ready to learn position" with their feet on the floor and their backs resting on the backs of their chairs or standing beside their desks. The teacher then described and modeled the exercise to the students. Following this, the teachers invited students to practice the exercise. It is important to note that students were not forced to participate, but rather invited to participate or just observe others. Finally, the teachers invited students to practice the exercise independently. At the end of the exercise, the teachers allowed time for students to "check-in" by having them close their eyes, and think about what they were feeling or experiencing in that present moment. Students were also given the opportunity to briefly share how they were feeling before starting writing lessons and activities. The yoga and mindfulness instruction took place over the course of four weeks.

After the implementation period ended, the teachers collected data on off-task behaviors again, using the same procedure and data sheet as before. In order to do so, students were provided with the visual posters of each exercise they learned, on the white board, in the front of the room, as well as brief reminder of each one. Then they were given five minutes to select an exercise or exercises to complete independently, based on

what their minds and bodies needed. After the students finished their exercises, the lesson of the day was begun and data was collected every five minutes, the same way it was collected prior to implementation. This data collection took place over the span of one week. Additionally, the students were given a post implementation writing On-Demand prompt. The same procedure, amount of time, and scoring rubric were used to measure writing quality. The teachers used these procedures to determine if the frequency of off-task behaviors lessened and if the quality of students' writing improved.

Yoga and Mindfulness Resources

Educate2B! is a program that was created by Allison Morgan, a registered yoga teacher and occupational therapist, to address challenges in the classroom that effect student achievement. The program provides breathing, movement, and mindfulness/meditation exercises to prepare students' minds and bodies to receive, store, integrate and use information for further learning (Morgan, 2015). Additionally, this program can be used for students with a wide range of cognitive and physical abilities in pre-K through 8th grade classrooms, to provide all students and teachers with short breaks that help relax and re-charge the mind and body. The exercises in the *Educate2B!* program manual are two to three minute activities that help improve students' five states of being and self-regulation. Morgan (2015) defines state of being as our internal climates, referring to how we are feeling, what we are thinking, and what we are doing in a given moment. She defines self-regulation as the management of one's state of being, in which one can adapt his or her attention, emotions, and/or behavior to meet the demands of the present moment. In *Educate2B!*, the five states are calm, peaceful mental and emotional state, energized, inner drive and enthusiasm, focused, maintaining selective

attention with and without distractions, positively connected, joined together to establish communication or collaboration, and ready, availability and preparedness to learn (Morgan, 2015).

Little Flower Yoga is an organization based in New York that was founded by Jennifer Cohen Harper in 2006. The organization provides yoga and mindfulness programs, resources, and support to educators and parents. One resource Harper has created is her book, *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance* (2013). Harper's book is a tool-based approach that provides yoga and mindfulness exercises in detail. Additionally, the book explores the science behind self-control, focus, and emotional regulation. In *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance*, Harper discusses five key elements. They are connect, breathe, move, relax, and focus. The Little Flower Yoga teaching method is based on five elements that, in combination, create a complete experience of yoga and mindfulness in a way that can be tailored for the developmental needs of every child (Haper, 2013).

The Newark Yoga Movement is a 501c3 non-profit organization that was founded by Debby Kaminsky in 2009. After learning the about the low statistics of graduation rates in Newark, Debby created the organization to give children tools they need to help them reduce stress and anxiety, increase focus, increase peacefulness and confidence, and unleash creativity. Newark Yoga Movement provides yoga to children in pre-K through twelfth grade in schools in Newark, New Jersey, at least twice a month. By doing so, these students are given opportunities to increase their inner peacefulness, focus, and

confidence. Additionally, Debby Kaminsky speaks at yoga workshops and conferences around New Jersey, in order to provide educators with tools to help students focus and to improve classroom management.

Variables

The independent variable for this study was the implementation of mindfulness and yoga techniques. These techniques were collected from a variety of resources including, *Educate2B!: Tools for Engaged Learning and Living* and *Little Flower Yoga for Kids: A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance*, and the New Yoga Movement. The general and special education teachers reviewed these materials to select yoga and mindfulness techniques they wanted to incorporate during their writing instructional periods. The dependent variables in this research study are the frequency of off-task behaviors, the improvement of academic achievement in writing, based on writing quality and, or, quantity, and the students' abilities to use yoga and mindfulness strategies independently to focus in writing class.

Chapter 4

Results

Summary

In this study, the effects of implementing and practicing yoga and mindfulness exercises in two sections of fourth grade inclusion writing classes were analyzed. Two classes participated in the study. Both classes received the yoga and mindfulness intervention. The intervention implemented was a combination of yoga and mindfulness exercises from *Educate 2B!*, *Little Flower Yoga*, and Newark Yoga Movement. The research questions to be answered were:

1. Do fourth grade students with and without disabilities demonstrate off-task behaviors less frequently during writing class after receiving yoga and mindfulness instruction?
2. What are the effects of yoga and mindfulness techniques on academic achievement and writing outcomes of fourth grade students with and without disabilities in writing class?
3. Will the effects of the yoga and mindfulness techniques be maintained when teacher guided instruction and practice is removed?

The study began by collecting baseline data on five off-task behaviors demonstrated in the classroom. Using the teacher-made data collection sheet, the researcher collected data on students' off-task behavior every five minutes over the span of a week. The five off-task behaviors, in which data was collected on, were: inappropriate body posture including leaning on the desk and sitting on one's feet, fidgeting with materials and utensils, talking during instructional time, improper eye

contact, and getting out of one's seat during instructional time. In addition to collecting baseline data on the target off-task behaviors, a baseline On-Demand writing task was administered to students and analyzed. The general and special education students were given forty-five minutes to complete their On-Demand task, in which they used the directions sheet to brainstorm ideas for five minutes, followed by typing their writing pieces on laptops for the remaining forty minutes. Both the general and special education teachers analyzed the writing pieces using the NJ Registered Holistic Scoring Rubric.

Group Baseline Results

Tables 1 and 2 show the baseline scores for both groups (Period 2 and 3). These scores show the frequency of each off-task behavior demonstrated prior to yoga and mindfulness implementation and instruction. Tables 3 and 4 show the students' baseline scores for their On-Demand writing tasks. Prior to intervention, the students completed the baseline writing task, which was scored from 0 through 5. A score of a zero meant the writing piece was non-scorable because it was off-topic, written in the wrong format, no response was provided, or it was not in English. A score of a five meant that a student demonstrated a strong command of the written language with few or no mistakes. Additionally, students were able to score half points, such as a score of 3.5.

Table 1

Period 2 Baseline Data of Off-Task Behaviors

Off-Task Behaviors	Frequency of Behavior (number of times observed)	Percentage
Inappropriate Posture	130	69.1%
Fidgeting with Materials/Utensils	16	8.5%
Talking During Instructional Time	12	6.4%
Improper Eye Contact	25	13.3%
Getting Out of Seat	5	2.7%

The data in table one shows that all five behaviors were observed over the one week data collection period. The behavior most frequently observed was inappropriate posture, which included students sitting on their feet and leaning on their desks. The least observed behavior, prior to yoga and mindfulness implementation was a student getting out of his or her seat.

Table 2

Period 3 Baseline Data of Off-Task Behaviors

Off-Task Behavior	Frequency of Behavior (number of times observed)	Percentage
Inappropriate Posture	75	60%
Fidgeting with Materials/Utensils	22	17.6%
Talking During Instructional Time	15	12%
Improper Eye Contact	8	6.4%
Getting Out of Seat	5	4%

Similar to the data collected for Period 2’s class, the data in Table 2 shows that all five behaviors were observed over the one week data collection period. The behavior most frequently observed was inappropriate posture, which included students sitting on their feet and leaning on their desks. The behavior least frequently observed was a student getting out of his or her seat.

Table 3

Period 2 Baseline Writing Scores

Subject	Baseline Score
A	4.5
B	4.5
C	3
D*	2
E*	0
F	5
G	5
H	5
I	3.5
J	4.5
K	4.5
L	4.5
M	2.5
N	4.5
O	3.5
P	3.5
Q	5
R*	4

The data in Table 3 shows all of the students' baseline On-Demand writing scores from the Period 2 class, including those students with disabilities. The students with disabilities have an * next to the subject letter for reference. Based on this data, one can observe that four students received the highest score of a five, while the rest have room to improve and receive a higher score. Additionally, only one student received a score of zero, or non-scorable, due to an off-topic writing piece.

Table 4

Period 3 Baseline Writing Scores

Subject	Baseline Score
A	4
B	5
C	3
D	3.5
E	3.5
F	EX
G*	1
H	4.5
I	3
J	5
K	EX
L	5
M	5
N	4
O	3.5
P	4
Q	5
R	N/A

Table 4 shows the baseline On-Demand writing scores of all of the students in the Period 3 class, including one student with a disability who has an * next to the subject letter for reference. In Period 3, five students received the highest score on their writing tasks. Additionally, there are two students who were exempt from the On-Demand writing task due to absences and the inability to catch them up on time. Finally, the data shows that this baseline writing task was not applicable to subject R, as this student was a new transfer to the school after the writing task had already been administered.

Intervention

After the baseline data was collected and analyzed, the yoga and mindfulness intervention was implemented by the teachers in the classroom over a period of four weeks. Tables 5 and 6 show the post implementation scores for both intervention groups, Periods 2 and 3. These scores show the frequency of each off-task behavior demonstrated after the teachers provided yoga and mindfulness implementation and instruction to the students. Tables 7 and 8 show the students' writing scores after the yoga and mindfulness intervention.

Table 5

Period 2 Post Implementation Data of Off-Task Behaviors

Off Task Behavior	Frequency of Behavior (number of times observed)	Percentage
Inappropriate Posture	66	81.5%
Fidgeting with Materials/Utensils	2	2.5%
Talking During Instruction Time	9	11.1%
Improper Eye Contact	1	1.2%
Getting Out of Seat	3	3.7%

Table 5 shows the frequency of behaviors demonstrated by the students in Period 2 after the yoga and mindfulness intervention. Based on the data in the table, all five behaviors were observed in the week-long data collection period. The behavior that was observed most frequently was inappropriate posture, while the least frequently observed behavior was improper eye contact.

Table 6

Period 3 Post Implementation Data of Off-Task Behaviors

Off Task Behavior	Frequency of Behavior (number of times observed)	Percentage
Inappropriate Behavior	49	77.8%
Fidgeting with Materials/Utensils	5	7.9%
Talking During Instruction Time	7	11.1%
Improper Eye Contact	1	1.6%
Getting Out of Seat	1	1.6%

Table 6 shows the frequency of behaviors demonstrated by the students in Period 3 after the yoga and mindfulness implementation and instruction. Based on the data in this table, all five behaviors were observed in the week-long data collection period. The behavior that was observed most frequently was inappropriate posture, while the least frequently observed behaviors were improper eye contact and students getting out of their seats.

Table 7

Period 2 Post-Implementation Writing Scores

Subject	Post Implementation Score
A	5
B	3.5
C	5
D*	2
E*	2
F	5
G	5
H	4
I	3.5
J	5
K	4.5
L	5
M	3
N	5
O	5
P	4
Q	5
R*	4

The data in Table 7 shows the writing scores of the students in Period 2 after yoga and mindfulness instruction was provided and practiced. Out of the 18 students in this class, half of them received the highest score, demonstrating a strong command of the written language. Additionally, no students received a non-scorable and the lowest score a student received was a 2, which represents a limited command of the written language.

Table 8

Period 3 Post Implementation Writing Scores

Subject	Post Implementation Score
A	3
B	5
C	4
D	3
E	4.5
F	4.5
G*	1
H	5
I	3
J	5
K	5
L	5
M	5
N	5
O	3
P	5
Q	5
R	3

Table 8 shows the writing scores of the students in Period 3 after yoga and mindfulness instruction was provided and practiced. Out of the 18 students in this class, half of them received the highest score, demonstrating a strong command of the written language. Additionally, no students received a non-scorable and only one student received a one, which represents an inadequate command of the written language.

Pre-Post Data Analysis

Table 9 shows the pre-and-post intervention scores of off-task behaviors demonstrated by all of the students in Period 2. From the table one can see that all five behaviors decreased in frequency after yoga and mindfulness instruction was implemented.

Table 9

Period 2 Frequency of Off-Task Behaviors Pre- and Post

Off Task Behavior	Baseline Frequency (number of times observed)	Post- Implementation Frequency (number of times observed)	Difference
Inappropriate Behavior	130	66	64
Fidgeting with Materials/Utensils	16	2	14
Talking During Instruction Time	12	9	3
Improper Eye Contact	25	1	24
Getting Out of Seat	5	3	2

The data in Table 10 shows the pre-and-post intervention scores of off-task behaviors demonstrated by all of the students in Period 3. The data in this table shows that that all five behaviors decreased in frequency after yoga and mindfulness instruction was implemented.

Table 10

Period 3 Frequency of Off-Task Behaviors Pre- and Post

Off Task Behavior	Baseline Frequency (number of times observed)	Post-Implementation Frequency (number of times observed)	Difference
Inappropriate Behavior	75	49	26
Fidgeting with Materials/Utensils	22	5	17
Talking During Instruction Time	15	7	8
Improper Eye Contact	8	1	7
Getting Out of Seat	5	1	4

The data in Table 11 shows the pre- and-post intervention writing scores for all of the students in Period 2. Based on this data table, half of the class, or 9 students improved their writing scores by 0.5 or more. Six students improved their writing scores 0.5 of a point, one student improved by 1.5 points, and two students improved by 2 whole points. Additionally, 3 students received the highest score of a five on both the pre- and post On-Demand writing task, therefore maintaining scores that are incapable of improvement. This data table also shows that four students shows neither growth nor regression by receiving the same score on both their pre- and-post intervention writing tasks, while only two students showed regression, each by one point.

Table 11

Period 2 Pre- and Post Implementation Writing Scores

Subject	Baseline Score	Post Implementation Score	Was improvement made?
A	4.5	5	Yes
B	4.5	3.5	No
C	3	5	Yes
D*	2	2	Stayed the same
E*	0	2	Yes
F	5	5	Stayed the same –no higher score possible
G	5	5	Stayed the same- no higher score possible
H	5	4	No
I	3.5	3.5	Stayed the same
J	4.5	5	Yes
K	4.5	4.5	Stayed the same
L	4.5	5	Yes
M	2.5	3	Yes
N	4.5	5	Yes
O	3.5	5	Yes
P	3.5	4	Yes
Q	5	5	Stayed the same- no higher score possible
R*	4	4	Stayed the same

Table 12 shows the pre-and-post intervention writing scores for all of the students in Period 3. Based on this data table, 7 students improved their writing scores after the yoga and mindfulness intervention. Six students improved by one whole point, while one student improved by 0.5 of a point. Additionally, 5 students received the highest score of

a five on both their pre- and post On-Demand writing tasks, therefore maintaining scores that demonstrate a strong command of the written language. The data in this table also shows that two students showed neither growth nor regression by receiving the same scores on both their pre-and-post intervention writing tasks, while three students showed regression, two regressing by one point and one regressing by 0.5 of a point. To determine whether or not the students that were exempt from the baseline writing task made improvements, scores from their previous On-Demand writing tasks were included in this data table. Finally, one student's score, Subject R, was unable to be used for this analysis because this student was a new transfer to the school after the baseline writing task had been administered.

Table 12

Period 3 Pre- and Post Implementation Writing Scores

Subject	Baseline Score	Post Implementation Score	Was improvement made?
A	4	3	No
B	5	5	Stayed the same- no higher score possible
C	3	4	Yes
D	3.5	3	No
E	3.5	4.5	Yes
F	EX (3, 3.5)	4.5	Yes
G*	1	1	Stayed the same
H	4.5	5	Yes
I	3	3	Stayed the same
J	5	5	Stayed the same- no higher score possible
K	EX (3.5, 4)	5	Yes
L	5	5	Stayed the same- no higher score possible
M	5	5	Stayed the same- no higher score possible
N	4	5	Yes
O	3.5	3	No
P	4	5	Yes
Q	5	5	Stayed the same- no higher score possible
R	N/A	3	N/A

General Education Students vs. Students with Disabilities

The data in Table 13 shows the frequency of off-task behaviors demonstrated by classified students with disabilities in Periods 2 and 3. Based on the data in this table, all five behaviors decreased in frequency after the yoga and mindfulness intervention. Three of the off-task behaviors were even stopped completely. They are fidgeting with materials, improper eye contact, and getting of their seats.

Table 13

Students with Disabilities Periods 2 and 3 Off-Task Behavior Frequency

Off-Task Behavior	Baseline Frequency (number of times observed)	Post Implementation Frequency (number of times observed)	Difference in Frequency (number of times observed)
Inappropriate Posture	9	4	5
	Avg: 2.25	Avg: 1.00	
	32%	67%	
Fidgeting with Materials/Utensils	3	0	3
	Avg: 0.75	Avg: 0	
	11%	0%	
Talking during Instructional Time	4	2	2
	Avg: 1.00	Avg: 0.50	
	14%	33%	
Improper Eye Contact	11	0	11
	Avg: 2.75	Avg: 0	
	39%	0%	
Getting Out of Seat	1	0	1
	Avg: 0.25	Avg: 0	
	4%	0%	

Table 14 shows the frequency of off-task behaviors demonstrated by the regular education students in Periods 2 and 3. Based on the data in this table, all five behaviors decreased in frequency after the yoga and mindfulness intervention.

Table 14

General Education Students Periods 2 and 3 Off-Task Behavior Frequency

Off-Task Behavior	Baseline Frequency (number of times observed)	Post Implementation Frequency (number of times observed)	Difference in Frequency (number of times observed)
Inappropriate Posture	196	111	82
	Avg: 6.12	Avg: 3.47	
	69%	80.4%	
Fidgeting with Materials/Utensils	35	7	28
	Avg: 1.09	Avg: 0.22	
	12%	5.1%	
Talking during Instructional Time	23	14	9
	Avg: 0.72	Avg: 0.44	
	8%	10%	
Improper Eye Contact	22	2	20
	Avg: 0.69	Avg: 0.06	
	8%	1.5%	
Getting Out of Seat	9	4	5
	Avg: 0.28	Avg: 0.13	
	3%	3%	

Chapter 5

Discussion

The purpose of this study was to expand research on the effectiveness of implementing mindfulness and yoga techniques into schools. More specifically, this study looked at the frequency of off-task behaviors before and after yoga and mindfulness intervention of fourth grade students, including students with disabilities, as well as whether or not students' academic performance in writing class improved with the help of yoga and mindfulness techniques. Additionally, the study examined if students could independently apply the exercises.

The results of this study found that the frequency of off-task behaviors, defined as inappropriate posture, fidgeting with materials, talking during instructional time, improper eye contact, and getting out of his or her seat, were significantly reduced in both classes (Periods 2 and 3) after the implementation of yoga and mindfulness exercises. Additionally, more than half of the students in each classroom improved their academic performance by 0.5 of a point or maintained the highest score of a 5 on the On-Demand writing task after the yoga and mindfulness intervention. Only four children regressed in academic performance on their post implementation On-Demand writing task and six did not progress nor regress. When comparing the general and special education students in these two classes, both populations of students demonstrated all five off-task behaviors less frequently after the yoga and mindfulness intervention. As shown by the pre-and-post data, these results were in line with the hypothesis of the study.

Through daily discussions of yoga and mindfulness practice, it was determined that the students were able to independently practice the exercises instructed. Many students volunteered to share that they felt comfortable using these exercises and could determine what thoughts were unimportant to a given task at hand. In particular, one student shared that he was trying to write a story and became very distracted. However, he used one of the mindfulness techniques to refocus his attention and was able to finish writing the story. More importantly than just independently use the exercises taught, the students were able to apply them to other classes and real-life situations. Students volunteered to share that they found these exercises to be helpful not just in writing class but in other situations. Examples included before a softball game to ease nervousness, when focusing on doing homework, at a dance recital before going on stage, when a sibling was being annoying, during any situations that make one feel angry or mad, and many more. Finally, students were able to identify their feelings and states of being. During discussions, students shared that they felt awake, focused, calm, relaxed, energized, thoughtless, and many others, depending on the activity practiced on a given day. These findings match the hypothesis and demonstrate that the instruction of yoga and mindfulness exercises were beneficial tools to help students in and outside of the school setting.

The results of this study were similar to the prior research available on yoga and mindfulness instruction in the classroom setting. Several studies have found the use of yoga and mindfulness programs to help improve academic achievement. For example, a research review by Felver and Jennings (2015) found that two studies, Bakosh et al. (2016) and Singh et al. (2016), used mindfulness training to improve academic

achievement. Both studies had positive results in academic performance, as well as showing improvement in academic engagement. Leland (2015) discussed learning skills and academic performance in his review of research on mindfulness and student success. Findings from his review suggest that focus, the heart of mindfulness, is crucial to academic success and that students that are trained in mindfulness can better focus on a task or lesson, improve study habits, and improve organizational skills. The current study shows that the majority of students' scores on the On-Demand writing task improved.

In addition to the similarities found between this study and previous research on academic achievement, the results on off-task behavior from this study are similar to findings from prior studies. The current study found that after the instruction and practice of yoga and mindfulness techniques in the inclusion classroom, students reduced off-task behaviors, allowing them to be more focused and attentive during instructional time. In the study by Broderick and Metz (2009), the students who used the mindfulness program reported increased feelings of calmness and relaxation, as well as improvements in attention. Crescentini, Capurso, Furlan, and Fabbro (2016) found similar results, in which a teacher's reports found specific positive effect of mindfulness-meditation training in the reduction of attention problems. The study by Peck, Bray, and Theodore (2005) also found that the use of a yoga videotape program improved the attention and compliance of elementary students with attention problems.

Both previous research and the current study found that yoga and mindfulness strategies can also be beneficial for children with disabilities in a variety of ways. As mentioned earlier, Beauchemin, Hutchins, and Patterson (2008) examined the feasibility of attitudes toward and outcomes of using a mindfulness meditation intervention with

students with learning disabilities. They found that, based on teacher ratings and reports, these students demonstrated improvements in social skills and academic performance. These results are similar to the results of the current study. Both the special and general education teachers noticed improvements in the social skills and participation of students with special needs during discussions on the yoga and mindfulness techniques. More specifically, the students with disabilities felt more comfortable sharing their thoughts and feelings after completing the exercises with their peers. In particular, one student, classified as Other Health Impaired, volunteered more frequently to share how he was feeling after he finished the yoga and mindfulness exercises than he did during the writing and grammar lessons that followed the daily intervention.

In addition to improvements made in social skills and participation, similarities and differences were found between the current study and the study by Beauchemin, Hutchins, and Paterson (2008) on academic performance. Of the four students with disabilities who participated in this study, only one student made improvements to academic performance, based on the pre- and post On-Demand writing tasks. This student scored a zero or non-scorable, on the baseline writing task and made improvements after the yoga and mindfulness interventions scoring a 2. The other three students with special needs that participated in this study showed no progression, nor regression. It is important to note that due to district mandates, no modifications or adaptations were allowed to be given for the On-Demand writing tasks. If modifications and adoptions were allowed to be made, these students may have improved their scores and academic performance.

Limitations

There are several limitations that require mentioning. One limitation is that there was no involvement of a control group. Based on the research questions presented in this study, the use of a control group was not deemed a necessity. Furthermore, the researcher of this study felt that both classes of fourth grade inclusion classrooms could benefit from the yoga and mindfulness intervention and therefore, chose to make neither a control group. However, without the use of a control group, this study may have been vulnerable to risks in internal validity.

A second limitation to this study is that the researcher served dual roles as both the main implementer of the yoga and mindfulness intervention and the observer of the study's participants. Having the main researcher function as both the implementer and observer in this study introduces a possible bias that may also impact the internal validity of the outcomes. To reduce the likelihood of bias, future research could include an observer or interventionist that does not know the purpose of the study or the hypothesized outcomes.

In addition to the lack of a control group and a possibility of bias, the length of the study may have had an effect on the variability of the results. This short term study took place over six weeks, in which pre-implementation data was only collected for a week, followed by four weeks of intervention, and only one week of post implementation data collection. A future, long term study with longer data collection periods could be beneficial.

Finally, this study took place towards of the end of the school year, which may have been a limitation. Although the intervention was conducted for the same amount of

time each day with consistent pre-and-post data collection periods, the students were occasionally engaged in different classroom activities and, or, had schedule changes due the school year winding down. These changes in activities or schedules may have had an effect on the variability of the data. Further research across the span of the school year could help reduce the possibility of this limitation.

Future Studies

Upon completion of this study and analysis of the data, future, long term studies could be beneficial to further determine the effects of yoga and mindfulness implementation in the inclusion classroom setting. After the researcher completed this study, a team of colleagues reached out to the district asking staff members to complete a survey on the incorporation of focused attention practices, including yoga and mindfulness. This team plans to create a committee in which a district plan and professional development experiences on focused attention practices will be provided to staff members. The researcher of this study has since then expressed interest in joining the team and committee, to further continue studying the use of these practices in classroom settings.

Implications for Practice

Unfortunately, there are not yet enough studies of yoga and mindfulness practice to effect change in the classroom. Additionally, there is little information yet on how to tailor yoga and mindfulness practices for children and adolescents, as well as students with disabilities. However, yoga and mindfulness practices can be adapted and instructed based upon the needs of the students in a classroom, the amount of time a teacher has, and how often students need yoga and mindfulness breaks. As the incorporation of yoga

and mindfulness practices in classrooms continue to be a hot topic in the education field, more and more studies and professional development are arising. For any teacher interested in incorporating these practices into his or her classroom, it is recommended that he or she attends workshops and professional development, researches them through books and scholarly studies, and implements these exercises in the classroom, in order to find what works best for his or her students.

Implications for Children with Special Needs

Through the findings of this study, as well as prior research, incorporating yoga and mindfulness into the classroom to help students with disabilities can have positive benefits. First, through the instruction and practice of yoga and mindfulness techniques, students with special needs can improve their abilities to focus, pay attention, and calm their minds and bodies. This in return can help improve their academic performances. In addition to these benefits, the use of yoga and mindfulness techniques can improve social skills, such as connecting with others and social interaction. The use of these exercises in the classroom setting for children with disabilities can create an environment that is inviting to share thoughts and feelings and can give these students tools needed to cope with frustration, anxiety, and sensory overloading. As mentioned above, there is no set time or specific way to teach yoga and mindfulness to children in the school settings. Therefore, it can be adapted and modified to meet the needs of any child. Goldberg (2013) mentions in her book, *Yoga Therapy for Children with Autism and Special Needs*, that the duration of the session, choice of postures and activities, and the extent of which interaction with others can be tailored to the individual. Therefore, yoga and mindfulness instruction can meet a child wherever he or she is.

Conclusion

Teachers today are observing and working with students that have a decreased ability to maintain focus, demonstrate more impulsive and off-task behaviors, and use poor management and coping skills. Additionally, teachers are working with increased numbers of students who have experienced or witnessed traumatic events, chronic stress, and severe anxiety from a young age, causing a mental health crisis for schools. Therefore, it is becoming necessary for teachers to adapt their instructional practices, to meet the needs of their students mentally, physically, and academically. The purpose of this study was to examine the effectiveness of implementing mindfulness and yoga techniques into two sections of fourth grade inclusion writing classes. The researcher sought to answer if fourth grade students with and without disabilities would demonstrate off-task behaviors less frequently during writing class after receiving yoga and mindfulness instruction, what the effects of yoga and mindfulness techniques were on academic achievement and writing outcomes of fourth grade students with and without disabilities in writing class, and if the effects of the yoga and mindfulness techniques would be. Over the course of the six week study, including one week of pre-implementation data, four weeks of yoga and mindfulness intervention, and one week of post implementation data, the researcher found that the instruction and practice of yoga and mindfulness exercises significantly decreased the frequency of off-task behaviors exhibited in the classroom. The researcher also found that many students improved their academic performance in writing class after the yoga and mindfulness intervention. These findings support the hypotheses made by the researcher and are consistent with previous research found in earlier studies. As the incorporation of yoga and mindfulness practices

in school settings becomes both a necessity and increasing trend, future research should include more long term studies on the effects of yoga and mindfulness in the inclusion classroom setting.

References

- Anderson, M. & Cardoza, K. (2016). Mental health in schools: A hidden crisis affecting millions of students. *NPR Education*. Retrieved from <http://www.npr.org/series/494272685/a-silent-epidemic-the-mental-health-crisis-in-our-schools>
- Beauchemin, J., Hutchins, T.L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities. *Complementary Health Practice Review*, *13*(1), 34-45. doi: 10.1177//1533210107311624.
- Bostic, J. Q., Navarez, M.D., Potter, M.P., Prince, J.B., Benningfield, M. M., & Aguirre, B.A. (2015). Being present at school: Implementing mindfulness in schools. *Child and Adolescent Psychiatric Clinics of North America*, *24*(2), 245-259. doi: 10.1016/j.chc.2014.11.010
- Broderick, P.C. & Metz, S. (2009). Learning to breathe: A pilot trial of a mindfulness curriculum for adolescents. *Advance in School Mental Health Promotion*, *2*(1), 35-46. doi: 10.1080/1754730X.2009.9715696
- Cardoza, K. (2016). Screening mental health in kindergarten is way too late, experts say. *NPR Education*. Retrieved from <http://www.npr.org/series/494272685/a-silent-epidemic-the-mental-health-crisis-in-our-schools>.
- Crescentini, C., Capurso, V., Furlan, S., & Fabbro, F. (2016). Mindfulness-oriented meditation for primary school children: Effects on attention and psychological well-being. *Frontiers in Psychology*, *7*(805), 1-12. doi: 10.3389/fpsyg.2016.00805
- Dalton, T., Martella, R.C., & Marchand-Martella, N.E. (1999). The effects of a self-management program in reducing off-task behavior. *Journal of Behavioral Education*, *9*(3/4), 157-176. doi: 10.1080/10530819912000157516.00/0
- Dempsey, J.D. (2017, March) Breathe in the peace zone. *New Jersey Education Association Review*, *90*(8), 22-25.
- Emanuel, G. (2016). How domestic violence in one home affects every child in a class. *NPR Education*. Retrieved from <http://www.npr.org/series/494272685/a-silent-epidemic-the-mental-health-crisis-in-our-schools>
- Felver, J.C. & Jennings, P.A. (2016). Applications of mindfulness-based interventions in school settings: An introduction. *Mindfulness*, *7*(1), 1-4. doi: 10.1007/s12671-015-0478-4
- Fishman, L. (2014). *Healing yoga*. New York, NY: W.W. Norton & Company.

- Flannery, M.E. (2017, Winter). This is your student's brain on trauma. *NEAToday*, 35(3), 42-45.
- Gardner, A. (2011). CDC: Autism, adhd, rates on the rise. Retrieved from <http://www.cnn.com/2011/HEALTH/05/23/autism.adhd.increase.cdc/>.
- Godwin, K.E., Almeda, M.V., Seltman, H., Kai, S., Skerbetz, M.D., Baker, R.S., Fisher, A.V. (2016). Off-task behavior in elementary school children. *Learning and Instruction*, 44, 128-143. doi: 10.1016/j.learninstruc.2016.04.003
- Goldberg, L. (2013). *Yoga therapy for children with autism and special needs*. New York, NY: W.W. Norton & Company.
- Harper, J. C. (2013). *Little flower yoga for kids: A yoga and mindfulness program to help your child improve attention and emotional balance*. Oakland, CA: New Harbinger Publications Inc.
- Hofer, M. (2007). Goal conflicts and self-regulation: A new look at pupils' off-task behaviour in the classroom. *Educational Research Review*, 2, 28-38. doi: 10.1016/j.edurev.2007.02.002.
- Killian, B., Hofer, M., Fries, S., & Kuhnle, C. (2010). The conflict between on-task and off-task actions in the classroom and its consequences for motivation and achievement. *European Journal of Psychology of Education*, 25(1), 67-85. doi: 10.1007/s10212-009-0007-8.
- Leland, M. (2015). Mindfulness and student success. *Journal of Adult Education*, 44(1), 19-24. Retrieved from <http://files.eric.ed.gov/fulltext/EJ1072925.pdf>.
- Levin-Gervasi, S. (1999). *The sensible sourcebook: Smart guide to yoga*. New York, NY: John-Wiley & Sons Inc.
- Marchand, W.E. (2014). Neural mechanisms of mindfulness and meditation: Evidence from neuroimaging studies. *World Journal of Radiology*, 6(7), 471-479. doi: 10.4329/wjr.v6.i7.471
- McEwen, B.S., Eiland, L., Hunter, R.G., & Miller, M.M. (2012). Stress and anxiety: Structural plasticity and epigenetic regulation. *Neuropharmacology*, 60, 3-12. doi: 10.1016/j.neuropharm.2011.07.014.
- Morgan, A. (2015). *Educate 2B! Tools for engaged learning and living*. Montvale, NJ: Zensational Kids, LLC.
- Napoli, M., Krech, P.R., & Holley, L.C. (2005). Mindfulness training for elementary school students: The attention academy. *Journal of Applied School Psychology*, 21(1), 99-109. doi: 10.1300/J008v21n01_05

- 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.
- Perle, J.G. (2016). *TEACHING Exceptional Children, 48*(5), 250-257. doi: 10.1177/0040059916643707.
- Perou, R., Bitsko, R. H., Blumberg, S. J., Pastor, P., Ghandour, R. M., Gfroerer, J. C., ... & Parks, S. E. (2013). Mental health surveillance among children—United States, 2005 -2011. *MMWR Surveill Summ, 62*(Suppl 2), 1-35.
- Ratcliff, N.J., Jones, C.R., Costner, R.H., Savage-Davis, E., Sheehan, H., & Hunt, G.H. (2010). Teacher classroom management behaviors and student time-on-task: Implications for teacher education. *Action in Teacher Education, 32*(4), 38-51. doi: 10.1080/01626620.2010.549714
- Salmon, P., Lush, E., Jablonski, M., & Sephton, S.E. (2008). Yoga and mindfulness: Clinical aspects of an ancient mind/body practice. *Cognitive and Behavioral Practice, 16*(1), 59-72. doi: 10.1016/j.cbpra.2008.07.002
- Schonert-Reichl, K.A. & Lawlor, M.S. (2010). The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. *Mindfulness, 1*(3), 137-151. doi: 10.1007/s12671-010-0011-8.
- Siegel, D.J. (2007). Mindfulness training and neural integration: Differentiation of distinct beams of awareness and the cultivation of well-being. *Social Cognitive and Affective Neuroscience, 2*(4), 259-263. doi: 10.1093/scan/nsm034
- Silas, E. & Goodney, D. (2003). *Yoga*. New York, NY: Franklin Watts.
- U.S. Public Health Service. (2000). *Report of the surgeon's general's conference on children's mental health: A national action agenda*. Washington, DC, USA: Department of Health and Human Services.