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Students diagnosed with attention deficit hyperactivity disorder: A study of on-task and Off-Task Behaviors in Traditional versus montessori classrooms

Sara-Frances Crow Lail
University of South Carolina

STUDENTS DIAGNOSED WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: A STUDY OF ON-TASK AND OFF-TASK BEHAVIORS IN TRADITIONAL VERSUS MONTESSORI CLASSROOMS

by

Sara-Frances Crow Lail

Bachelor of Arts
University of South Carolina, 2008

Master of Science
Winthrop University, 2011

Specialist in School Psychology
Winthrop University, 2012

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Accepted by:

Toby Jenkins-Henry, Major Professor

Kamania Wynter-Hoyte, Committee Member

Andrea Henderson-Platt, Committee Member

Rhonda Jeffries, Committee Member

Cheryl L. Addy, Vice Provost and Dean of the Graduate School

DEDICATION

This dissertation is dedicated to my family. The journey through coursework, an immeasurable amount of time in research, as well as writing, all while working full-time and raising my first child, would have been impossible without the unyielding love and support of my husband, parents, and extended family, all of whom encouraged me along the way. I am beyond indebted to my parents, Steve and Vicki Crow. Words cannot express my gratitude for the countless hours my mother spent proofreading thousands of words and providing counsel at all hours over the course of my studies. Furthermore, I am thankful to her and my father for being my most avid cheerleaders in each level of my education. They are both the epitome of fortitude, intellect, and grace.

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Again, I would like to express gratitude to my husband, son, parents, and other family members for their unyielding love and encouragement as I pursued this career and educational goal. I will forever be grateful for each person's support over the course of my studies.

ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD), a common neurobehavioral disorder in childhood, negatively impacts academic and social functioning, both of which later influence adulthood (Bose, 2013). This action research study focuses on comparing the prevalence of on-task and off-task behaviors exhibited by elementary age students diagnosed with ADHD in a traditional classroom structure versus a Montessori classroom structure. While much time and research has been conducted to assist educators in meeting the needs of students with learning disabilities through interventions, less research has focused on non-conventional educational environments as an alternative for children with ADHD. In this study, on-task and off-task behaviors of second and third grade elementary students (with parent-reported ADHD diagnoses) will be examined during core instruction in a school district that offers parents a choice between traditional instruction or Montessori instruction. A mixed methods approach using a structured observation system, field notes, narrative observations, teacher interviews, and parent questionnaires will be used to collect qualitative and quantitative data. While further studies will be beneficial to determine to what degree, if any, a difference in classroom behavior is present in students with ADHD between these two contrasting classroom structures, this action research study will serve to benefit parents and educators in understanding the possible effects of on-task and off-task behaviors to academic achievement in the two different instructional environments.

Keywords: *attention deficit hyperactivity disorder, on-task behaviors, off-task behaviors*

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LIST OF ABBREVIATIONS

ADA ..... Americans with Disabilities Act

ADHD ..... Attention Deficit Hyperactivity Disorder

BOSS .....Behavioral Observation of Students in Schools

CBM .....Curriculum Based Measurement

CDC .....Centers for Disease Control and Prevention

DSM-V .....Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

ELA .....English Language Arts

IDEIA .....Individuals with Disabilities Education Improvement Act

IEP ..... Individualized Education Program

MANCOVA ..... Multivariate Analysis of Covariance

NASP ..... National Association of School Psychologists

NEA .....National Education Association

PK .....Pre-Kindergarten

SES ..... Socioeconomic Status

CHAPTER 1: RESEARCH OVERVIEW

1.1 INTRODUCTION

Parents of students with various diagnoses and/or educational disabilities often face challenges in making educational decisions as their children progress through school. In a district or school that offers a choice of two different classroom settings, traditional and Montessori, this challenge most often begins as early as kindergarten.

This decision-making process can often be particularly stressful for parents of children with disabilities as they seek to understand the pros and cons of each setting and which might better meet the educational needs of their child. While parents are given the opportunity to request that the child be transferred later if a setting is not working, this change is often not preferred as the child may be faced with additional transitional challenges. For this reason, parents are encouraged to carefully consider, prior to first grade, both instructional designs offered in choosing the more appropriate option for their child. As a school psychologist serving students with various diagnoses and disabilities, this researcher has become aware of the need to gain a deeper understanding of the differences between the two different educational settings and the effect each may or may not have on the academic success of the students. As research confirms that the percentage of children with ADHD in our country is growing (Lee, Miller & Vostal, 2013), there is a significant need to explore the two educational options and to share these findings with parents, teachers, and administrators. As Dana and Yendol-Hoppey (2014) note, "good and ethical teaching involves closely observing students as they work –

watching for any behavior that provides insights into students' acquisition of knowledge and understanding and adjusting teaching according to these insights" (p. 148).

Studying the on-task and off-task behaviors of students diagnosed with ADHD during core instruction in each of the different environmental structures may provide insight into the prevalence of these behaviors and possible effect the classroom environment has on this behavior. In this study, on-task behaviors include times when the student is visually attending to instruction, actively engaged in an assigned task, or any other behavior that is related to the teacher's directions, such as transitioning between lessons or retrieving necessary materials. Off-task behaviors include the target student not visually attending to the teacher or the source of instruction, fidgeting with an object, speaking or moving around the room without permission, or any other behavior that does not appear to be related to the assigned task or instruction. The goal of this action research study is to discover the extent to which differences exist between behaviors of students diagnosed with ADHD in each of these classroom structures. This information will be shared with parents and educators in the district in which the study took place to aid in selecting the better choice of instruction for students diagnosed with ADHD.

1.2 PROBLEM OF PRACTICE

The study of on-task and off-task behaviors of students diagnosed with ADHD during core instruction in either the traditional classroom or the Montessori classroom will provide insight into the possible effect that the classroom environment has on classroom behavior. Results of this study will serve not only as an instructional aid to teachers, but will also provide information for parents in making more informed decisions as to the placement of students with ADHD. The researcher is employed as a

full-time school psychologist serving students in pre-kindergarten (PK) through adult education in a rural, predominantly Title 1 district. In addition to the traditional classroom setting and method of instruction, this school district provides the Montessori instructional method for grades PK through eighth in five elementary schools and two middle schools. Approximately 6,000 students are enrolled in this district. With approximately 1,000 of these students attending the Montessori option, it is currently the largest public school Montessori program in South Carolina (National Center for Montessori in the Public Sector, 2013–2015).

The traditional or conventional classroom structure follows a more customary educational approach in which the teacher instructs a single grade level by presenting new material during whole group instruction, followed by corresponding activities in which all students are expected to participate. The Montessori classroom structure is quite different, consisting of multiple grade levels in order to achieve multi-age groupings. Material is presented through a more individualized student approach. According to the American Montessori Society (2015a), the "classroom is prepared by the teacher to encourage independence, freedom within limits, and a sense of order" (para 4). The grade levels are grouped into clusters of three. For example, the elementary schools' groupings for Montessori classes include the following: primary Montessori for ages 3, 4, and 5 years; lower elementary Montessori for first through third grade; and upper elementary Montessori for grades fourth through sixth.

As a school psychologist, this researcher often attends meetings for students with Individualized Education Plans (IEPs) and 504 Student Accommodations Plans as well as meetings for students referred to the schools' "Student Support Teams" for varying

reasons which may include behavioral concerns, academic achievement, intervention planning, and educational disabilities. Given the unique nature of this district offering a large public Montessori program, questions from parents and legal guardians concerning which educational setting is more appropriate for their child – traditional or Montessori – are often asked. Parents often inquire about the possibility of changing their child from one setting to another if their educational progress is not meeting grade level expectations or if behavioral concerns persist to the extent of interfering with academic progress. These questions lead to discussions among the educators, interventionists and administrators, all of whom may have differing opinions and points of view on the subject. While each of these professionals offer valuable input from their own personal experiences and observations, little research exists to offer more concrete information in regard to the two specific settings and students with special educational needs. Guardino and Fullerton (2010) note the significant gap in research connecting classroom environment modification with behavior. "Although the well-designed classroom has proven benefits, there is little research on the impact environmental modifications have on behavior and learning" (p. 9). More research on the implications of behavior on achievement and in a school setting, in general, is readily available. Anderson and Myers (2010) suggest that, "Students learn more when both teachers and students spend more time actively engaged in academic tasks" (p. 2). In addition, Hannon and Johnson (2014) reference a study stating, "problem behavior in structured tasks predicted lower academic outcomes, motivation, attention, and persistence in academically focused tasks" (p. 41) and that "problem behavior in same-aged students predicted student underachievement" (p. 41).

The majority of children served by the researcher have different medical diagnoses and/or educational disabilities that in some way interfere with the children's progress in the general education curriculum, with the largest percentage being those with some degree of ADHD associated learning disabilities. The Centers for Disease Control and Prevention (2015) reported on survey data that showed that "approximately 11% of children 4-17 years of age (6.4 million) have been diagnosed with ADHD as of 2011" (para. 3). Given that Montessori is offered in this school district for PK through eighth grade, the question of choosing which educational method is the better fit for children with special needs occurs most commonly during the lower elementary grades, when the workload increases for young students around second and third grade. While the Montessori Method is designed to provide instruction for students with varying cognitive abilities, as well as children with special needs, many educational professionals recognize the advantages and disadvantages of this setting for students with disabilities such as ADHD.

The information gathered from researching how these two classroom structures possibly impact the prevalence of on-task and off-task behaviors for elementary students diagnosed with ADHD, as well as their academic achievement, will not only be beneficial for the families, administrators and educators involved in the instructional decision-making process for the identified students, but will also encourage decisions being made in the best interest of the students in terms of selecting the setting that is more appropriate for each student. Although more research specifically studying behaviors in a traditional instructional setting as opposed to a Montessori setting is needed, research is available regarding the effects of behaviors including symptoms of

ADHD on children in school and academic performance. DuPaul and Jimerson (2014), for example find that "students with attention-deficit/hyperactivity disorder (ADHD) exhibit chronic behavior difficulties that deleteriously impact their academic and social functioning in school settings" (p. 379). In addition to behavior affecting academic performance, the learning environment also affects student behavior.

Soleil (1995) argues that whether a child succeeds or fails in school "depends on 'goodness of fit': how well within-child variables (such as biological predispositions) interact with environmental variables (such as classroom expectations). In the classroom as in the world, 'biology and environment are interactive'" (p. 3). A child exhibiting more off-task behaviors most likely will suffer in educational performance due to loss of instructional time. In addition, as Almeda, Baker, Fisher, Godwin, and Petroccia (2013) note, "loss of instructional time due to off-task behavior is a well-established problem in educational settings, recognized both by researchers and practitioners for over a hundred years" (p. 2428).

1.3 RESEARCH QUESTIONS

Research questions in this study focused on identifying whether there was a difference between the prevalence of on-task and off-task behaviors exhibited by elementary age students diagnosed with ADHD in a conventional classroom setting versus a Montessori classroom setting. Mixed methods integrated in action research were used to answer the following questions:

1) What are the behavioral differences displayed in elementary students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) in a

traditional classroom structure as opposed to a Montessori classroom structure?

2) What are the differences in academic achievement in the traditional sample as opposed to the Montessori sample as measured by grade level Curriculum Based Measurements (CBM)?

1.4 RESEARCH OBJECTIVES

The first objective in this study was to describe the types of on-task and off-task behaviors observed in a sample of elementary students diagnosed with ADHD during core instruction in the traditional classroom and in the Montessori classroom. The second objective was to describe the frequency of these behaviors in each of the classroom instructional settings. The third objective was to explore the effect that each of the two different classroom structures might have on the on-task and off-task behaviors and the level of academic achievement of elementary students with ADHD.

1.5 PURPOSE OF THE STUDY

The purpose of this study was to examine the potential impact the traditional classroom structure as opposed to the Montessori classroom structure might have on elementary age students diagnosed with ADHD by examining the differences in on-task and off-task behaviors during core instruction and the level of academic achievement in each of the two settings in a public school district in South Carolina that offers both methods of instruction.

1.6 ACTION RESEARCH DESIGN

John Dewey's Progressive Movement in education focused on the teacher as a facilitator using problem solving and scientific inquiry as key components in curriculum

planning. As Anderson and Herr (2015) explain, "the theoretical foundations of action research in education are grounded in the importance that John Dewey gave to human experience and active learning in the generation of knowledge" (p. 21). Anderson and Herr further define action research as a research paradigm used to study a topic of particular interest to a practitioner in the specific setting in which they practice. In addition, they note that the action research design is intended to gather data, reflect upon the findings, and utilize the knowledge gained to benefit the specific group of professionals and students to which the study applies (2015). Action research is site- and context- specific and does not have a broad generalizable goal beyond enhancing the outcomes or experiences of the selected site. Of course, other similar sites might choose to use results to enhance their practice if relevant.

This researcher collected data on a sample population of second- and third-grade students diagnosed with ADHD from three elementary schools in an upstate South Carolina public school district. The sample included an equal number of students with ADHD attending both traditional classroom instructional settings and Montessori instructional classroom settings. Using both quantitative and qualitative measures in the form of questionnaires, interviews, narrative observations, field notes, and time sampling observations, the researcher used a mixed-methods action research design. In considering the validity of this research, quantitative methods such as behavior time sampling and academic achievement measures were included in the qualitative research design.

1.7 RATIONALE AND HISTORICAL CONTEXTUALIZATION

While educational leaders in the United States continue to strive for social justice and equity of all students, children with disabilities, "a population of students who cross all boundaries of class, race, and gender" (Cole & Pazey, 2013, p. 183), are often overlooked. Cole and Pazey (2013) provide that leadership training programs tend to "narrow their focus to students from ethnically and racially diverse backgrounds, all but ignoring children with disabilities" (p. 182). In addition, they suggest that parents of children with disabilities, especially those of low socio-economic background, lack the knowledge and confidence to make thoughtful, well researched decisions regarding their child's academic path (2013). This responsibility often falls on the teachers and administrators.

Conflicting opinions concerning the more beneficial environment for students diagnosed with ADHD exist among Montessori classroom teachers, traditional classroom teachers, and other educational professionals in this researcher's school district. The researcher consults with parents, teachers, and district behavior interventionists, several of whom testify that children with attention and executive functioning skill deficits as well as students who struggle with being overactive perform better in the conventional classroom setting, which may provide more structure, organization, and guidance for the students. The argument made is that the traditional classroom is designed to provide not only more structure in its physical appearance, as in the arrangement of desks in rows or in groups of four to five facing each other at tables, but also in instruction, as all of the students work on a teacher-led activity or assignment at the same time. Students work in

either small groups, individual seatwork, or as a whole group listening to a teacher-led lesson.

On the other hand, Montessori teachers contend that such students are better accommodated in a Montessori instructional setting, which is designed to allow the students the self-direction and independence to choose from a variety of developmentally and academically age appropriate activities during instructional time. Students are allowed to complete tasks at their own pace. The structure of this classroom setting permits the students to move freely, an implied advantage for those who are overly energetic, throughout the classroom during instructional time. Schmidt (2009) argues that "our properly prepared Montessori environments of school and home are designed primarily to offer skills training. When correctly implemented, our Montessori principles can be a huge help to our children in building skills to develop focus and concentration" (p. 31). HubPages author, Tracy Conway (2013) notes that "it might seem logical that a child with ADHD would thrive in a Montessori classroom since they can move from task to task and work at a rapid pace which corresponds to their natural rhythm" (para 2). However, Conway (2013) also suggests the following:

> A secondary issue plaguing children with ADHD is that, according to Dr. William Barbaresi of Harvard, studies suggest that nearly 40% of children with ADHD have deficits in reading, math and writing. Montessori schools are most often not equipped to provide an ADHD student with the volume of specialized assistance they need in these subject areas. The Montessori education method relies on students being primarily independent learners while students with ADHD need more guidance than the Montessori classroom can realistically offer. (para 4)

1.8 CONCEPTUAL FRAMEWORK

The Montessori theory is based on the developmental stages identified by Dr. Maria Montessori in the early 1900s. According to Firestone (2003-2015), Dr. Montessori believed that children naturally progress through the following phases of learning: individual self, social development, the adult phase, and the mature phase. Firestone also notes that these "phases, or stages, are what Dr. Montessori called 'windows of opportunity,' and she designed the classroom with age-appropriate tasks and materials to maximize learning during these stages" (para. 5). Classes consist of multi-age groupings in an effort to resemble real-world situations and to provide students the opportunities to learn from other students who are at different phases of the learning process. The environment is designed with materials grouped by subjects on shelves and in centers with few tables and desks, as children are instructed to move freely around the classroom, selecting the lesson/materials of their choice and working at an individual pace. During instruction, the teacher records observations, assists on an as-needed basis and works with small groups. Gottesman (n.d.) observes that "large groups occur only in the beginning of a new class… and are phased out as the children gain independence. The child is scientifically observed, observations recorded and studied by the teacher" (para. 10).

Several years ago this researcher moved from a public school district offering traditional classroom structure to one that offers both traditional as well as Montessori structured instruction from preschool through eighth grade. In working with a variety of students with various educational and emotional needs, from psychoeducational evaluations to behavioral and academic interventions, the researcher has observed

students on numerous occasions in both educational environments. While both teaching methods offer different instructional approaches and noteworthy differences in environmental structures, students and teachers seem equally to enjoy and support both approaches. However, in intervention planning meetings as well as other team meetings, such as meetings to discuss IEPs, the choice of which educational setting – traditional or Montessori – should be recommended for a particular student often becomes a topic of concern.

In conversations that the researcher has had with other professionals, including behavior interventionists, it has been stated that students with certain characteristics, such as those commonly seen in children diagnosed with ADHD, do not tend to do well in a Montessori environment. Such an environment can, at times, appear chaotic, seemingly lacking structure, with students moving frequently around the room, working on different tasks simultaneously. There is less direct instruction and supervision from the classroom teacher, but more student-centered instruction and guidance. Other professionals, such as certified Montessori teachers/instructors, share accounts of students with learning disabilities, such as ADHD, being successful in the Montessori environment, as the freedom to be mobile and in control of lesson selection is motivating and beneficial for children exhibiting characteristics of ADHD.

As parents struggle with which of the two options is the better instructional and environmental choice for their particular student with special needs, research-based information is essential in to provide the parents more knowledge regarding classroom behaviors and the possible link to academic achievement of ADHD students in education that is both traditionally and non-traditionally structured. The researcher's interest in

studying this topic stemmed from realizing the significance of research concerning the educational environment and the link between classroom behaviors and academic achievement. To date, there is limited research related to this topic to aid parents, such as those in this district, in making such an important decision for their children. Realizing that this was a small study conducted in only one school district, additional research would be beneficial to further validate or refute these findings. The goal of this research is to share the results of this study with parents, teachers, and other educators in this district to serve as a tool for making a more informed decision as to which program offered might be the better choice for each individual child's educational needs.

1.9 METHODOLOGY

As a practitioner working with students in a school district that values Montessori education, as well as the choice of traditional education, this researcher has a vested interest in these two environmental structures and in gathering additional research regarding these two settings. This action research study followed Mertler's (2014) description in *Action Research: Improving Schools and Empowering Educators*:

> Action Research is defined as any systematic inquiry conducted by teachers, administrators, counselors, or others with vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach and how their students learn. (p. 4)

This study combined a focus on the researcher's interest in the two educational environments and how students with ADHD behave during core instruction within these varying educational structures.

A mixed-methods approach was used to collect data showing the behavioral differences of second- and third-grade students diagnosed with ADHD during core instruction in a traditional classroom setting as opposed to a Montessori classroom setting. Differences in academic achievement were also measured from this sampling using CBMs for core academic areas to explore a possible connection between behaviors and academic achievement in the two contrasting instruction settings.

Students for the sample, a minimum of five from each setting, were selected from information gathered from questionnaires distributed to parents of second- and third-grade students from the two settings. Based on the information received from the questionnaires, the researcher sought to obtain diversity of race and gender in the sample.

The research site included seven classrooms, both traditional and Montessori, within three elementary schools. In the documentation of this research, for the purpose of anonymity, the school district was referred to as, "Oakland School District" and the selected elementary schools were identified as, "Longview Elementary School," "East Bridge Elementary School," and "Hampton Elementary School."

In addition to the parent questionnaire and measure of academic achievement, additional data sources included semi-structured interviews with the second- and third-grade teachers from each classroom, narrative observations and time sampling observations. The parent questionnaire consisted of a series of close-ended questions designed to provide information regarding student demographics, history of the diagnosis of ADHD, whether the student was prescribed medication at the time of the study, educational history (enrolled in Montessori or traditional), and behavioral concerns. The questions required the parent to select from a list of responses including a "Yes" or "No"

response, circling answer options, and/or filling in the blank. Detailed field notes were documented for the narrative observations of each student. In addition to narrative observations, a time sampling observation form was used to document the percentage of on- and off-task behaviors for each student during time sampling observation periods. The time sampling observation measure used was the *Behavioral Observation of Students in Schools* (BOSS) developed by Pearson. Two narrative observations, each lasting a minimum of 30-minutes, and seven 15-minute time sampling observations were completed for each student to equal a total of nine observations per student. Observations occurred during different time periods of the day when students were engaged in core academic instruction and lessons, such as English, Language Arts and Mathematics.

1.10 LIMITATIONS

Personal bias of the researcher was one potential limitation of the study. The researcher served as the sole observer in the study for both the narrative observations and the time sample observations. While the BOSS software was a standardized measure that used clear definitions of behavioral codes, there remained the possibility for unintentional bias on the selection of the codes or the researcher-observer's interpretation of specific behaviors. Coded behaviors logged in the narrative observation notes, had the possibility of personal bias as the researcher determined which code was most appropriate.

In addition, even though the researcher clarified to teachers that the observations were focused solely on individual student behaviors in the natural classroom environment and not the teacher or the lesson plans, the presence of the researcher may have altered the teaching method or plans used by the teacher in various observation settings.

Although the researcher entered each classroom and attempted to stand or sit in an area of the room to remain as unobtrusive as possible, the researcher's presence may have influenced various reactions or behaviors exhibited by students in the classroom.

Other potential limitations in this research study include the time period in the school year as well as cultural barriers. In future studies, it may be beneficial to collect observational data at different points in the school year versus taking place during one semester. Furthermore, cultural differences such as language barriers for families who speak English as a second language may have hindered the number of completed questionnaires returned in each of the classes. Added to these limitations was the potential inaccuracy of the parent-reported information on the questionnaires that were completed and returned. Information regarding formal diagnoses of ADHD and educational history was taken solely from the information reported by the parent/guardian and no additional school or medical records were accessed to cross-check this information.

The sample size of this study was small with only five students from each of the two settings. While a mixed-methods approach was used to strengthen the findings of this study, the quantitative measures of academic achievement were not planned to be generalizable. Although the data gathered from the quantitative measures may indicate potential differences in academic achievement among elementary students with ADHD in a Montessori setting as opposed to a traditional setting, future studies need to confirm such differences with a larger sample of students.

1.11 DISSERTATION OVERVIEW

Following the description of the purpose, problem of practice and rationale for this study in Chapter 1, Chapter 2 will provide a review of scholarly literature relative to this research. While limited research is currently available specifically addressing behaviors of students with ADHD in a Montessori setting versus a traditional classroom setting, significant research exists on behavioral implications in the classroom in general, symptoms and performance of students with ADHD, the impact of classroom environment and students with disabilities in a Montessori setting, and the link between off-task behavior and academic achievement. Chronis and Raggi (2006) noted that "symptoms of inattention typically result in off-task behavior in the classroom; failure to listen to classroom or task instructions; forgetting to complete and turn in, losing or failing to finish assignments; and shifting activities often" (p. 86). Chapter 3 will provide a detailed description of the chosen research design and the methodology for the action research study. The findings from the data will be examined, discussed, and interpreted in Chapter 4, followed by an overview of the study and suggestions for future research in the final chapter of this dissertation.

1.12 CONCLUSION

Research in this area will aid educators, interventionists, and parents in understanding whether a difference exists between classroom on-task and off-task behaviors of students diagnosed with ADHD in a traditional instructional setting versus a Montessori instructional setting.

This study was designed to serve as a means to gain knowledge regarding on-task and off-task behaviors of children diagnosed with ADHD in two different classroom

settings offered within this researcher's district of employment. The results of this study will be shared with educators, parents, and the community to increase insight and understanding regarding the two instructional environments offered in this public school district. While the researcher will emphasize to parents and colleagues that this is just one study and more research is needed to further examine this topic, the data obtained from this study will serve as an aid to parents and educators in making more informed decisions when contemplating the advantages and disadvantages of the traditional as opposed to the Montessori setting for a student diagnosed with ADHD.

1.13 GLOSSARY OF KEY TERMS

Attention Deficit Hyperactivity Disorder. ADHD is a "neurobehavioral disorder" diagnosed in children, adolescents and adults (National Institute of Neurological Disorders, 2015, para 1). According to Geng (2011), the *Diagnostic and Statistical Manual of Mental Disorders* defines ADHD as "a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development" (p. 17). Classified as a neurobiological, developmental disability, ADHD is diagnosed by medical professionals such as pediatricians and physicians, as well as by mental health professionals, such as school psychologists (Geng, 2011). A person diagnosed with ADHD is classified as one of the following three subtypes as defined by the DSM-5TM (2015):

1. ADHD, Inattentive-Type
2. ADHD, Hyperactive/Impulsive-Type
3. ADHD, Combined-Type (para 5)

Off-task behaviors. For the purpose of this study, off-task behaviors are defined as behaviors in which the target student is not visually attending to the teacher, assignment, or source of instruction; when the student is fidgeting with an object/materials; inappropriately speaking (to peers or others); out of seat without permission; or any other behavior in which the student is not doing the assigned task (e.g., sleeping, daydreaming). Off-task behaviors are often disruptive and include activities such as "walking around the classroom when staying seated is expected, talking out of turn, intrusive verbalizations, not following through on instructions and interrupting teacher instruction" (David, 2013, p. 4).

On-task behaviors. On-task behaviors are defined as any time a student is visually attending to the teacher and/or the source of instruction, directly working on the assignment/activity assigned by the teacher, and other behaviors indicating the student is following directions (e.g., transitioning from one activity to the next, retrieving appropriate materials). Eye gaze will be used as the measure for documenting on-task behaviors in student observations. Almeda et al. (2013) describe eye gaze as follows: "If children were directing their eye gaze at the teacher (or classroom assistant), the instructional activity, or toward appropriate instructional materials, the child was classified as on-task" (p. 2429).

CHAPTER 2: REVIEW OF LITERATURE

2.1 INTRODUCTION

Alternative education options for parents of students with various diagnoses and/or educational disabilities often present challenges for educational decisions as their children progress through school. The past fifteen years have seen the growth of Montessori education offered in public schools across the United States as an optional instructional method of teaching (National Center for Montessori in the Public Sector [NCMPS], 2014). Census data collected from the NCMPS provides that in 2014, a student population of 112,486 were enrolled in 447 public Montessori programs currently offered in the United States, with 137 of those programs serving adolescents. South Carolina ranked at the top in the number of public Montessori schools (NCMPS, 2013-2015).

In a district or school that offers a choice of two different classroom instructional programs, traditional and Montessori, the challenge for parents most often begins as early as kindergarten when the parent is presented with the option. Parents unfamiliar with the Montessori philosophy of education may feel unprepared to make a knowledgeable decision and find themselves dependent upon the advice of educators within the school or administrative system as to the placement of their child. The choice may be particularly stressful for parents of children with disabilities as they seek to understand the advantages and disadvantages of Montessori versus traditional. While parents are provided the opportunity to later request that the child be transferred from one

instructional setting to the other at any point during the educational process, change is often not encouraged as the child may experience transitional challenges. For this reason, parents are urged to carefully consider, prior to first grade, the two educational options offered in this public school district in order to choose the more appropriate one for their child.

2.2 PROBLEM OF PRACTICE AND PURPOSE

As education is not a "one size fits all" approach, alternative educational options are designed to provide parental choice and the opportunity to enhance a child's education. Manner (2006) notes that "the Montessori Method has long received consideration as an alternative to traditional educational practices" (p. 1). The majority of the over 5000 Montessori programs in the United States remains in the private sector (Else-Quest & Lillard, 2006, p. 1893). Research studies on the impact of Montessori's method, however, are limited, with the few that exist, presenting mixed findings of this method compared to the traditional method of instruction (Else-Quest & Lillard, 2006). While advocates of Montessori education feel that students with or without educational disabilities will benefit from its design, traditional education proponents often express that too much freedom is a detriment to the educational achievement in children with particular learning disabilities, such as ADHD. Montessorians argue that "for any specific population…knowing the characteristics and special needs helps the educator to match…lessons to the specific abilities and learning differences of the student" (Pickering, 2003, p. 13). Pickering (2003) acknowledges, however, that there will be more non-productive classroom time for a special needs child unable to focus and stay

on-task as the Montessori teacher "cannot help this child exclusively and at the same time meet the needs of other students" (p. 13).

Educators, school psychologists, and administrators find that while there is abundant research on ADHD behaviors, the relationship of on-task and off-task behaviors to academic achievement, and the Montessori educational philosophy, there is a gap in the current research on the effect of behavior patterns of students with ADHD in the two contrasting environments, Montessori and traditional. According to Raggi and Chronis (2006), "there exists a strong link between ADHD and academic underachievement" (p. 85). Ryniker and Shoho (2001) referenced several studies that suggested that there is "surprisingly little research on any aspect of Montessori education, especially considering that it has been a part of the worldwide educational scene since the early part of this century" (p. 45). Access to research-based advice when considering the more appropriate option in their child's education will be valuable to parents in their decision making process.

This action research study focused on exploring the prevalence of on-task and off-task behaviors exhibited by elementary age students diagnosed with ADHD in a traditional classroom structure as opposed to a Montessori classroom structure. Research supports that off-task behavior of ADHD students contributes to deficits in the overall learning of these students (Chronis & Raggi, 2006; Lee et al., 2013). Hyperactivity, impulsivity, and inattention have been linked to academic underachievement in students diagnosed with ADHD (Lee et al., 2013). Lee et al. also suggest that while this student population may have the academic ability to be high achievers, their inability to stay on task results in lower achievement.

This research study was completed by a full-time school psychologist in a rural, predominantly Title 1 public school district, which will be referred to as "Oakland School District," serving students in pre-kindergarten (PK) through adult education. In addition to the traditional classroom setting and method of instruction, this school district provides the Montessori instructional method for grades PK through eighth in five elementary schools and two middle schools. Approximately 6,000 students are enrolled in the district with approximately 1,000 of these students attending the Montessori option, currently the largest public school Montessori program in South Carolina (NCMPS, 2013–2015). The goal of this action research study was to explore the possible differences in behaviors exhibited during core instruction and the possible link to academic achievement in a sampling of elementary students diagnosed with ADHD in each of these classroom structures – traditional and Montessori. The results will be shared with parents, teachers, special education coordinators, and administrators in this district to aid in choosing the better option for instruction for each individual student with ADHD.

One study that examined the quality of experience, motivation and social context for middle school students in Montessori versus traditional classrooms noted that, "most researchers now believe that the negative changes that often occur in middle school result from a *mismatch* between the typical learning environment at school and an adolescent's developmental needs" (Rathunde, 2003, p. 16). Mackinnon (2007) provides the following commentary in regard to a study completed by Else-Quest and Lillard:

> To make informed choices about schooling, parents and policy-makers everywhere are in dire need of proper comparisons between different education

systems. Unintended misinformation through poorly performed studies only serves to make the current state of confusion over the pros and cons of various education systems worse. (p. 596)

2.3 IMPORTANCE OF THE LITERATURE REVIEW

This chapter provides a review of available literature that highlights the importance and relevance of this study as well as the need for additional research on the topic of interest. The literature review includes the methodological design as related to this study; theoretical perspectives of John Dewey, Maria Montessori, and Jean Piaget; the history of Maria Montessori as well as the Montessori movement and method of instruction; traditional public education method of instruction; the prevalence of students diagnosed with ADHD; evidence of the impact of behavior on academic achievement; and behavioral characteristics that interfere with on-task behavior and learning. Other research regarding classroom environment and the differences between the Montessori setting and the traditional educational setting is also presented in this review. This information provides knowledge in the areas of behavior and academic achievement as well as traditional and alternative educational settings.

The Montessori Method and movement. While research has been conducted to assist educators in meeting the needs of students with learning disabilities through interventions, less research has focused on non-conventional educational environments as an alternative option for children with ADHD. According to Almeda et al. (2013), "there has been limited research examining the factors associated with off-task behavior," (p. 2428) although "recently researchers have begun to explore the role of classroom design on children's off-task behavior" (p. 2428). Anita and Guardino (2012) note that

"classroom physical environments can influence the way students behave. The physical arrangement and features of the classroom environment, such as seating arrangements, lighting, and organization, can influence students' behavior and attention to academic tasks" (p. 518).

The Montessori Method of instruction has progressed steadily since its reintroduction to the United States in the late 1950s as an alternative to traditional instruction and has become an option in many public school systems in the United States as well as continuing to be offered in the private school curriculum sector. In the early 1970s, Baines and Snortum (1973) noted that, "for over 60 years, the Montessori method has posed a radical alternative to traditional teaching practices, but there has been little documentation of the impact of this approach upon classroom behavior" (p. 313).

In more recent years, the Obama administration's agenda for educational improvement recognized the need "to look outside the box for ways to 'restore the promise of America's public education, and ensure that American children again lead the world in achievement, creativity, and success'" (as cited in Powell, 2009, p. 18). Advocates of the Montessori Method remained hopeful that Obama's emphasis on school reform combined with a renewed interest in Montessori education would lead to the Montessori philosophy being more accepted as an alternative instructional approach in public education (Powell, 2009). Lillard (2008) noted, however, that Montessori research has focused more often on pre-school/kindergarten education and suggested the need for more "controlled studies" (p. 21) in the elementary and upper levels of Montessori instruction.

Prevalence and implications for students diagnosed with ADHD. Lee et al. (2013) note that "in the United States, estimates between 3% and 5% of the school-age population are accepted, and many of these students qualify for accommodations and/or services under Section 504 of the Vocational Rehabilitation Act or the Individuals with Disabilities Act" (p. 32). The Americans with Disabilities Act (ADA) protects the rights of people with disabilities, including the growing population of those diagnosed with ADHD (Castaneda, Hopkins, & Peters, 2013). ADHD is a neurobiological disorder that affects people from all races, classes, and genders (Cataneda et. al., 2013). Research indicates racial and ethnic disparities in the diagnosis of ADHD among kindergarten children. For example, white children are diagnosed with ADHD at a significantly higher rate than their Black and Hispanic peers (Farkas & Hillemeir, 2014). Farkas and Hillemeir report that black school age children were reported to be 70% less likely than school age White children to be diagnosed with ADHD despite having many similarities. Farkas and Hillemeir also suggest that the disparities between the White and Hispanic students were not as clear due to language differences.

Classroom structure. While many professionals argued that the Montessori Method was more appropriate for children with attention deficit concerns, others advocated for a traditional classroom that offers more structure and teacher direction. McKenzie and Zascavage (2012) stated that, "many children with special needs have attention deficit problems and are easily distracted. The Montessori classroom allows them to focus on tasks rather than on the conversation of others" (p. 36). On the other hand, Ruud's (2014) study provided contradictory evidence as it noted that, "it was also found that inclusion in a Montessori setting does not work effectively for every child with

a disability" (p. 4). Ruud argued that "transitions, inconsistency and too much freedom are a challenge with inclusive Montessori education" (p. 4).

According to the article "Ten Big Differences between Montessori and Traditional Education" (2004), Montessori classroom environments are prepared according to student observations to include "student centered lessons and activities" (para. 2). This article also provides a comparison with traditional classrooms, which "are based on teacher-centered lessons or activities" (para. 2). The following figures provide examples of the physical differences between the classroom layouts of a Montessori setting and a traditional classroom setting. Figures 2.1 and 2.2 demonstrate the arrangement of desks and materials in each setting. Figures 2.3 and 2.4 include images of students during instruction in a Montessori setting as well as students in a traditional setting.

Figure 2.1. A picture of a lower elementary Montessori classroom. Taken from Montessori NC. (n.d.). My Montessori classroom. Retrieved from https://i.pinimg.com/originals/59/8f/e9/598fe907cf99977636c158dc4676c5cb.jpg.

Figure 2.2. A picture of an elementary classroom which provides an example of a traditional classroom environment. From *Elementary classroom in Alaska*. (2007). Retrieved from https://commons.wikimedia.org/wiki/File:Elementary_classroom_in_Alaska.jpg

Figure 2.3. Photograph which displays students interacting in a Montessori classroom environment. From Mongeau, L. (2013). Students at the Creative Montessori Learning Center in East Palo Alto play and learn through various activities during their half-day state preschool class. Retrieved from https://edsource.org/2013/family-fee-for-half-day-state-preschool-likely-to-be-rescinded/30392

Figure 2.4. A photograph of students interacting in a traditional classroom environment. From Kelley. B. (2015). Como Elementary classroom. Retrieved from https://www.minnpost.com/learning-curve/2015/10/race-equity-and-lessons-st-pauls-como-elementary

2.4 THEORETICAL BASE AND HISTORICAL CONTEXT

In 20th century educational reform, John Dewey (1859–1952) played a major role in the progressive education movement in America, while in Europe Maria Montessori (1870–1952) and Jean Piaget (1896–1980) were advocating similar progressive ideas of their own specific educational theories (Mooney, 2013). Each theorist had differing views in philosophy and approach, but all three were in general agreement that children should be active participants in the learning process. These three theorists further advocated real-life experiences and independent thinking (2013). Child-centeredness through observation was also a common element proposed in each of these progressive philosophies; however, the "idea of child-centeredness…varies" (Tzuo, 2007, p. 34).

Child-centeredness relates to the interests of the child and a curriculum designed around those interests. The term also includes the teacher's role in the learning process (Tzuo, 2007). Theories in child development, as well as the progressive movement in

education, brought changes in 20th-century education that continue to be embedded in the American education system. Dewey is considered by many to be the most influential figure in American education in the twentieth century, with his revolutionary progressive approach focused on the child and its purpose to "facilitate the naturally developing tendencies and potential of the child" (Ultanir, 2012, p. 199). Dewey (1897) laid out his progressive philosophy on education in his document, *My Pedagogic Creed*. He emphasized curriculum that reflected the interests of the student and promoted social living: "The only true education comes through the stimulation of the child's powers by the demands of the social situations in which he finds himself" (para. 2). In his creed, Dewey (1897) advocated that education is achieved through experience but not all experiences are necessarily educational. While the interests of the child must be considered, the teacher's role "is not…to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child" (para. 20). In sum, according to Mooney (2013), Dewey proposed that teachers are capable through their experience and knowledge to plan and implement the appropriate curriculum for the student, one that would reflect the values of family and community. In 1938, Dewey expanded on the teacher's role in regard to the child's freedom in the educational process in *Experience and Education*, suggesting that order in the classroom is a necessity (Tzuo, 2007). Tzuo (2007) asserted that the goal of education, according to Dewey, "is to develop children's freedom of intelligence, rather to allow children to act randomly on their impulses" (p.36). The freedom of intelligence is achieved as children assess and observe in their natural environment under the guidance of their teacher (Tzuo, 2007).

According to Mooney (2013), the Swiss psychologist Jean Piaget believed that "children learn only when their curiosity is not fully satisfied" (p. 80). This theory aligned with the progressive philosophies of John Dewey and Maria Montessori. The concept of child-centeredness is based on child development theories and the progressive movement (Tzuo, 2007). Piaget and Montessori differed in specific child development theories, while each of the three, Dewey, Piaget, and Montessori, advocated varying degrees of teacher control and freedom of the child in their child-centered approaches to education.

Similar to the Montessori approach, Piaget's constructivist approach grew from his interest in the progressive movement and is one that allows children a great amount of freedom in a classroom environment in which the teacher observes as the children explore (Tzuo, 2007). The learning environment for constructivists supports active, collaborative learning and child-centeredness. It is also encouraging and self-monitoring (Ultanir, 2012). Central to the constructivist theory is "the task of the educator...not to dispense knowledge but to provide students with opportunities and incentives to build it up" (p. 197). The child's developmental stage should guide the instructional approach (Matthews, 2003). As Waite-Stupiansky (1997) stated:

> Children need to progress through levels of representation at a rate that fits their levels of understanding. If highly abstract symbols are presented too quickly, such as flash cards with words printed on them, children may achieve only a surface-level of memorization without deeper understanding. (p. 54)

According to Mooney (2013), while children's interactions with their environment build intellectual progression, Piaget stressed that cognitive growth is

influenced by physical development and "is affected by children's interactions with the environment" (p. 81). Piaget's stages of cognitive development are defined by four age ranges with correlating stages and behaviors (2013). Piaget encouraged the teacher to assist in constructive learning, understanding that while children learn at their own pace, "the ability to learn at different ages in childhood is based on logical development" (Ultanir, 2012, p. 203). Both Piaget and Montessori based their theories of child learning stages on their own perception of child development stages through observations of children. Their stage-based theory proposed that children express different interests at different stages of development. Matthews (2003) notes that although Piaget and Montessori defined the age ranges slightly different, the general description of child development stages suggested that "during infancy the predominant activity involves emotional contact" (p. 54), followed by age two years when children enter the phase in which they begin manipulating objects. Matthew also notes that "from ages three to seven years role playing develops, and from age seven to eleven years formal study in school occurs" (p. 54).

Dr. Maria Montessori believed that every child has the ability to learn during his/her "own period of development" (Tzuo, 2007, p. 36) when their mind can absorb certain knowledge "without external motivation" (p. 36). According to Helfrich (2011), she defined these critical periods as "sensitive periods" (p.63). In every child the greatest capacity to learn takes place during different stages of sensitivity (Ultanir, 2012). Montessori's four stages of development, referred to as "planes of development" are separated into age ranges, similar to those of Piaget. Helfrich (2013) summarized each plane of development in *Montessori Learning in the 21st Century* as follows:

- Recognition of the innate learning powers naturally present in the child;
- Recognition of the kinds of activity that support and nurture development spontaneously; and
- The surrounding environment has the flexibility to change and accommodate the different skills and activities needed in each plane of a child's development. (p. 33)

The First Plane, ages three to six, lays the foundation to progress through the remaining planes (Helfrich, 2013). During the earliest years of this plane, the child's home environment should be nurturing, and provide opportunities for independent activities.

The Second Plane, ages six to 12, provides for the child to begin to "explore the larger world surrounding him" (Helfrich, 2013, p. 40). Helfrich notes that in this level, the child explores teamwork and the responsibilities of each member of the team. The child learns more about making decisions, determining the difference between right and wrong.

In the Third Plane, which is composed of ages 12 to 18, major physical changes are taking place. In addition to physical and emotional changes in adolescence, the child develops a natural curiosity to expand their interests in different types of occupations and career opportunities (Helfrich, 2013).

In Montessori's Fourth Plane, which includes ages 18 to 24, "young adults establish economic independence and…begin to participate as full citizens in their community and country" (Helfrich, 2013, p. 47). During this plane, young adults are ready to accept responsibility to create their own family. Thus, the cycle repeats.

The child's knowledge will develop when offered a prepared environment with carefully chosen materials that the child can freely explore (Tzuo, 2007). This can be accomplished through careful observation and reflection to guide the planning of an appropriate learning environment and curriculum (Mooney, 2013). The Montessori philosophy "is centered on the interaction between objects and individual. The teacher acts as an observer to find a child's inner spirit and offers an orderly environment in which children can develop and grow" (Tzuo, 2007, p. 36). The Montessori pedagogy encourages teaching independence through the promotion of student ingenuity and self-discipline in problem solving (Ultanir, 2012).

Dewey, Piaget, and Montessori shared common beliefs in the most effective learning process of a child, although each had a vision seen from a different perspective. These great thinkers were viewed as being ahead of their time in "guiding humanity to a greater understanding of the nature of the child… creating a new vision for child development and education" (Helfrich, 2011, p. 1). Their pedagogy claimed that "the acquisition of knowledge and learning is about constructing meaning as opposed to passive reception" (Ultanir, 2012, p. 208). The groundwork for alternative education in schooling children was laid by the progressive movement and the constructivist theories of the 20th century.

Traditional education was based on the premise "that the purpose of the schools is to transmit knowledge, skills, and standards of good conduct" (Powell, 2009, p. 13). New classroom environments allowing freedom within a structured environment and encouraging the student's natural curiosity were advocated as more effective educational practices than those of the traditional practices. Powell observed that the Montessori

Method aligns with 21st century expectations for education as it promotes student autonomy and collaboration. While Dewey, Piaget, and Montessori remain among "the most influential progressive thinkers in the modern history of education…Montessori has had the more tangible impact" (Matthews, 2007, para. 7), as an inspiration in child-centered alternative education in America's private and public school systems.

Who was Maria Montessori? Maria Montessori, the only child of Alessandro Montessori and Renilde Stoppani was born August 31, 1870, in Chiaravalle, Italy (Stroud, 2002). She became the first female medical doctor in Italy, graduating from the University of Rome Medical School in 1896 (Helfrich, 2011). Early in her career, research in the development of the brain led her to a local asylum for those considered insane. According to Helfrich (2011), Montessori's focus became the children from "poverty-stricken environments" (p. 2) and who were considered to be "misfits of society" (p. 2). Helfrich notes that Montessori's observations and research focused on the child's environment and the child's "strong desire to learn" (p. 4). As her work continued, Montessori challenged the educational mindset of her time by advocating that "mental deficiency was a pedagogical problem rather than a medical one" (Stroud, 2002, p. 28). She advocated that all children, regardless of varying degrees of learning differences, should be offered equal educational opportunities, believing that "defective children were not extrasocial beings, but were entitled to the benefits of education as much, if not more, than normal ones" (Standing, 1957, p. 29). In 1907, after opening the *Casa dei Bambini* (Children's House) in a slum area of Rome, Dr. Montessori's implementation of her educational materials and methods based on observations of the child, was the beginning of the Montessori Method. According to the American

Montessori Society (2015b) this method was a unique philosophy that "sparked the interest of educators worldwide. In the following decades Montessori schools opened throughout Europe, in North and South America and, finally, on every continent but Antarctica" (para. 1).

Lillard (1996) characterized Montessori as "both a pragmatist and a visionary" (p. 3). In contrast to conventional educational instruction, which is centered around the teacher in a structured environment, under the Montessori Method, students have control over the pace and choice of their daily learning. The consequences of their decisions, whether they succeed or fail, teach independence. Murray (2011) claimed that Montessori "pupils [are] equipped in their whole being for the adventure of life, accustomed to the free exercise of will and judgment, illuminated by imagination and enthusiasm" (p. 26). Autonomy is the central element in Montessori's educational philosophy as it is "based on a fundamental belief in providing children freedom within limits" (Murray, 2011, p. 24).

In her critique, *A Critical Consideration of the New Pedagogy in its Relation to Modern Science*, Dr. Montessori focused on the flaws in scientific pedagogy in regard to teaching and learning as she cautioned educators against being overly influenced by theory (Flinders, 2013). As an example, Montessori cited the over emphasis of the traditionally structured classroom, with straight rows of desks, constructed from the average physical measurements of children, in which natural movement was restricted. Montessori (1912) was critical of traditional education methods that promoted passivity, and illustrated her need for educational reform by comparing students in a rigid, controlled classroom environment to dead butterflies, with wings pinned in a display box.

"In such a school the children, like butterflies mounted on pins, are fastened each to his place, the desk, spreading the useless wings of barren and meaningless knowledge which they have acquired" (p. 25). Montessori went on to criticize the role of teachers in "the ordinary classroom" (p. 28) who were required to "pour certain cut and dried facts into the heads of the scholars" (p. 28). She argued that in order to accomplish this rigid learning environment, teachers must enforce sustained stillness and attention through a system of rewards and punishments.

Montessori Philosophy. This traditional philosophy of education runs counter to Montessori's belief in a child-centered environment that encourages the natural spirit of discovery. "The Montessori teacher is advised to serve mainly as an observer…and to provide a well-ordered, stimulating environment in which the children are free to roam, talk, work singly or in groups, and learn by discovery" (Baines & Snortum, 1973 p. 313). The teacher is to be the organizer of his/her classroom in a setting that is designed to be both intellectually and socially suitable for children (Murray, 2011). According to Tzuo (2007), Montessori believed that "the teacher's happy task is to show children the path to perfection, furnishing the means and removing the obstacles" (p.36). The Montessori environment is "scientifically planned and methodically formed" (Lillard, 1998, p. 78) with the teacher being "only part of the environment" (p. 78). Montessori's philosophy and the constructivist philosophy "are allies in the struggle to liberate all children from conventional educational methods which, by their design, blunt the child's natural curiosity and hunger to learn" (Powell, 2000, p. 50).

Contemporary traditional education. Although the traditional classroom historically involved a teacher-oriented approach in a physical environment in which

desks were arranged in straight rows, as previously noted, Chudy, Juvova, Kvintova, Neumeister, and Plischke (2015), described how the "roles of the teacher and the student" (p. 345) as well as the "environmental influences" (p. 345) have evolved with pedagogical constructivism in current educational practices. Chudy et al. (2015) state that:

> While the student was traditionally viewed as an object of education that is taught, while the central figure in the teaching process was the teacher, currently the student is regarded an educational subject who, to some extent, manages his/her education actively and independently (so-called self-controlled/self-regulated learning). (p. 345)

Chudy et al. also note that contemporary educational practices aim to "involve the student in an active way" (p. 347), as "active involvement of the student should be applied in order to develop the ability to generalize, understand the context and associate" (p. 347). The physical layout of the traditional classrooms has evolved from straight rows of desks to more groupings that promote collaboration among students. Gertoz (2015) highlighted this development: "The importance of a collaborative environment cannot be overstated" (para 2). Geortz described observations of contemporary traditional classrooms as "students gathered around tables, desks forming a large circle, and desks in clumps" (para 3).

2.5 TRADITIONAL VERSUS MONTESSORI CLASSROOM

The Individuals with Disabilities Education Improvement Act (IDEIA) is a federal law that protects the rights of children between the ages of three and 21 who are diagnosed with disabilities and provides guidelines for states in providing special

education and early intervention services. In addition, Section 504 of the Rehabilitation Act, a federal nondiscrimination law, provides guidelines to protect individuals who meet criterion as persons with a "physical or mental impairment which substantially limits one or more major life activities" (US Department of Health and Human Services, 2006). School-age students diagnosed with ADHD may qualify for individualized special education services in the form of an Individualized Education Program (IEP) under IDEIA or a 504 Accommodations Plan under Section 504 of the Rehabilitation Act.

In this research study, the public school district provides students in grades kindergarten through eighth the choice of enrollment in one of two offered classroom structures—traditional and Montessori. Both settings are instructed by certified teachers who serve students in the general education population in addition to those students who are formally identified as students with disabilities and who qualify for individual plans such as IEPs and 504 Accommodation Plans.

The traditional or conventional classroom structure follows a more customary educational approach "focusing on established standards (e.g., norm referenced test, grades, formal and informal tests) for each grade level, in which the entire class is moved through the curriculum by teacher lead activities" (Matthews, 2003, p. 60). The teacher instructs a single grade level by presenting new material during whole group instruction, followed by corresponding activities in which all students are expected to participate.

The child-centered Montessori classroom structure is quite different from this traditional model, as materials are incorporated among various subjects in an effort to align with the interests of the students (Matthew, 2003). The Montessori Method consists of multiple grade levels in order to achieve multiage groupings. Material is presented

through a more individual student approach and one in which the teacher has an unobtrusive role. The American Montessori Society (2015a) identifies the goals of the method as follows: "The classroom is prepared by the teacher to encourage independence, freedom within limits, and a sense of order" (para. 4). The grade levels are grouped into clusters of three. For example, the elementary schools' groupings for Montessori classes include the following: primary Montessori for ages three through five years, lower elementary Montessori for first through third grade, and upper elementary Montessori for fourth through sixth grades. Baines and Snortum (1973) provided the following descriptions of the two settings:

> In the traditional classroom, the teacher directs the class from the front of the room, following lesson plans which cover prescribed academic skills and content. By way of contrast, the Montessori classroom has no "front," is devoid of a teacher's desk, and children pursue their projects on the floor or at tables. (p. 313)

Evolution of the traditional classroom setting. Gonzalez and Kuuskorpi (2011) acknowledged noteworthy progressions in the school setting over the last century including cultural changes, social changes, and advancements of technology and communication resources in schools. They stated that, "these factors have contributed to shape the teaching and operating cultures of schools and created shifts in our expectations of the physical learning environment" (p. 1). Definitions of traditional education likely vary in different locations (Thompson, 2001–2017). For example, Thompson (2001–2017) notes that in the United States, traditional education emphasizes student preparedness for attending post-secondary educational institutions and career readiness.

Thompson observed that "a traditional education in the U.S. focuses on helping students master key skills such as reading, writing, math and science" (2001–2017, para. 2). Furthermore, he supported the idea that the mastery of such skills is heavily weighted by the results of academic achievement measures.

Wireman (2016) supported that although changes from the 20th century traditional educational setting may not seem significant, traditional classrooms have progressed to more flexible, student-centered learning environments in the 21st century. According to Wireman (2016), "twenty-first-century classrooms are driven by student's interests, and the open, flexible spaces allow students to come together to share, collaborate and create" (2016, para. 5). Wireman's article also supports the use of technology as promoting more inclusive settings. The integration of technology "supports inclusive classrooms, as it allows students to move at their own pace whether they are looking for opportunities for enrichment or need help to catch up" (Wireman, 2016, para. 9).

2.6 CLASSROOM STRUCTURE

Ames (1992) observed that "classroom and other learning environments have frequently been described in terms of the ways in which certain kinds of instructional demands, situational constraints, or psychosocial characteristics relate to various cognitive and affective outcomes in students" (p. 263). In defining classroom structures, Ames (1992) provided that "these structures include…the tasks and learning activities, evaluation practices and use of rewards, and distribution of authority or responsibility" (p. 263). Almeda et al. (2013) discussed research examining other factors that contributed to off-task behaviors, such as "design choices" in regard to environmental features and classroom décor. In addition, Almeda et al. noted that "instructional format

(e.g., whole-class instruction, small group instruction) is another important aspect of instructional design. Yet, little is known about the relationship between instructional format and overall rates and types of off-task behavior" (p. 2429).

Elementary Montessori environments are structured by mixed-age classrooms – children ages six to nine and children ages nine to 12 (Lillard, 1988, p. 78). This structure promotes "accelerated social-emotional growth and increased exposure to language" (*The Montessori Classroom*, n.d.). The American Montessori Society (2015a) *Introduction to Montessori* article states:

> Multiage groupings are a hallmark of the Montessori Method: younger children learn from older children; older children reinforce their learning by teaching concepts they have already mastered. This arrangement also mirrors the real world, where individuals work and socialize with people of all ages and dispositions. (para. 5)

Activities are presented to the students in small groups "in a manner that appeals to their imagination by using clear and visible symbols" (Lillard, 1988, p.80). This instructional approach is then followed by individual exploration and repetition at each child's individual pace with the teacher encouraging the student until the skill is mastered. In addition, a "central element of classroom learning is the design of tasks and learning activities" (Ames, 1992, p. 263). In the Montessori method, "students are allowed to choose and complete work at their own pace" (Bagby, Diaz, Howell, Sulak, & Thompson, 2013, p.14) during an uninterrupted timeframe (e.g., three hours). The students are allowed freedom to select from and among all subject areas as well as explore other activities during their learning periods, teaching the child to make choices

encouraged by his/her natural curiosity. The American Montessori Society (2015a) argues that "the child, through individual choice, makes use of what the environment offers to develop himself, interacting with the teacher when support and/or guidance is needed" (para. 4).

The Montessori environment is designed for students to work at their own pace and at their own level. The materials, placed on shelves, are chosen by the teacher and foster independent learning (Murray, 2011). The minimal structure in Montessori instructional environment encourages students to choose material that is meaningful to them (Cook, 2009). Lopata, Finn, and Wallace (2005) observe that "because each child's development is different, the individual child is allowed to choose activities, trusting the child's sensitive periods will guide him to choose the work for which he is ready" (p. 2). Cook (2009) provided that traditional school settings rely on curriculum requirements to guide the presentation of materials in contrast to the individually paced Montessori Method of instruction. Lillard (1996) published the Montessori Bill of Rights in *Montessori Today: A Comprehensive Approach to Education from Birth to Adulthood* as follows:

- To act by oneself and for oneself
- To act without unnecessary help or interruption
- To work and to concentrate
- To act within limits that are determined by the environment and the group
- To construct one's own potential by one's own efforts. (p. 57)

Furthermore, Cook (2009) noted that one major difference between Montessori and the traditional setting was that "more emphasis is placed on the social development of the

child and learning is matched to the child's social development" (p. 6) in the Montessori approach.

The traditional classroom setting consists of one grade level per classroom and includes instructional methods of whole-group instruction, individual seatwork, and group assignments. The arrangement of desks in the traditional classes varies; some classrooms are arranged in groups, in pairs, or in rows. Lopata, Finn and Wallace (2005) referenced that in conventional classroom settings, "students follow teacher-directed work" (p. 2) while in the Montessori classroom structure, "students typically spend three to four hours per day in self-selected individual and small-group work and spend less than one hour per day in whole-group instruction" (p. 2). In Cook's (2009) study, she stated that, "a traditional classroom has text books, pencils and worksheets, and a unit driven curriculum with individual subjects" (p. 6), and that within this setting, "a large emphasis is placed on academic learning with social development being secondary" (p. 6). Student learning in traditional classrooms is "dependent on the dispensing of information and assignments from the teacher" (Ryniker & Shoho, 2001 p. 47). Traditional classroom environments are more teacher-centered, focusing on structure and consistency in teaching core curriculum standards, and are guided by clear timelines and expectations.

2.7 ATTENTION DEFICIT HYPERACTIVITY DISORDER

The ADA encompassed physical and mental impairments that significantly interfere with or limit "major life activities" (Castaneda et al., 2013, p. 461). Included among the defined disabilities is ADHD. According Castaneda et al., the ADA amended the definition of "major life activities" in 2008, stating that learning skills, such as

reading, processing, communicating and concentrating are among life activities considered to be major. Moreover, Castaneda et al. note that behavioral characteristics of ADHD, such as hyperactivity and difficulty in attentiveness, were described as symptoms that negatively affect academic and social functioning. Castaneda et al. point out that the ADA further recognized that physical and mental disabilities are inclusive of all people, regardless of culture, race, gender, sexual orientation, and age.

Panksepp (1998) identified that "attention deficit hyperactivity disorders (ADHDs) are the most common childhood psychiatric problems in our society" (p. 91). The *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) defined the key characteristic of ADHD as "a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development" (American Psychiatric Association, 2013b, p. 61). The CDC (2015) collected survey data and reported that "approximately 11% of children 4–17 years of age (6.4 million) have been diagnosed with ADHD as of 2011" (para. 3). The National Survey of Children's Health (NSCH) from 2003-2011 reported that one in eleven (8.8%) children between the ages of four and 17 had a current diagnosis of ADHD with 69% of the children diagnosed taking medication to treat symptoms of ADHD (National Resource Center on ADHD, n.d.).

As research confirmed the growing percentage of ADHD children in our country (Lee et al., 2013), it has become important to explore the two educational options in Oakland School District to uncover the effect each option may or may not have on this group of students, and to share these findings with parents, as well as with teachers and administrators in this district, given its unique educational options. Fullerton and Guardino (2010) noted that "although the well-designed classroom has proven benefits,

there is little research on the impact environmental modifications have on behavior and learning" (p. 9). Studying the on-task and off-task behaviors of students diagnosed with ADHD during core instruction in each of the different environmental structures will provide insight into the prevalence of these behaviors and the possible effect the classroom environment has on this behavior. In *The Case for Constructivist Classrooms*, Braniff (2011) noted that:

> When a teacher arranges classroom dynamics so that she is the sole determiner of what is right in the classroom, most students learn to conform to expectations without critique, to refrain from questioning teacher directives, to seek permission for judgmental and evaluative feedback. The rest disengage. (p. 2)

2.8 ADHD AND ACADEMIC ACHIEVEMENT

The American Psychiatric Association (2013a) defined ADHD as being "characterized by a pattern of behavior, present in multiple settings (e.g., school and home), that can result in performance issues in social, educational, or work settings" (p. 1). Representative in ADHD were inadequacies in executive function and motivation (Antrop et al., 2013). Antrop et al. stated that "although deficits in executive function…have been shown to predict ADHD-related academic underperformance, it has been suggested that ADHD behaviors, in particular attention, are even a stronger predictor of performance" (p. 488). Planning, organization, and time management are specific executive functioning skills, encouraged in Montessori instruction "as children are guided to choose and prioritize their work, design work plans, and reflect on the success of their own time management" (Boulmier, 2014, p. 45). Research indicated the

significance in understanding the relationship of on-task behaviors of children within their classroom environment and academic difficulties (Antrop et al., 2013).

The majority of the parents this researcher serves in Oakland School District have children with different medical diagnoses and/or educational disabilities that in some way interfere with the child's progress in the general education curriculum, with a large percentage being those with some degree of ADHD with associated learning disabilities. Research estimated that ADHD is diagnosed in "3–8% of children" (Altin et al., 2013, p. 2). Furthermore, numerous studies indicated that students diagnosed with ADHD often face achievement challenges in school. According to Altin et al. (2013), "ADHD often results in a number of functional impairments including academic difficulties and social skills deficits. Functional disability, primarily including academic performance, was a major concern for most parents who have children with ADHD" (p. 2).

Anastopoulos, DuPaul, Power, and Reid (2014) examined the impact of behavioral symptoms of ADHD and functional impairment in schools noting that "the academic achievement of students with ADHD is .60 to .75 standard deviations below their non- ADHD classmates" (p. 409). Barkley (1997) associated poor academic performance and achievement, as well as suspensions, expulsions and retention, with ADHD. Supporting research by Vostal, et al. indicated that off-task behaviors, such as hyperactivity and impulsivity, decreased learning opportunities and may have contributed to a student's decision to drop out of school.

In this school district, the challenge of choosing which educational philosophy is the better fit for their child seems to manifest more often for parents and guardians during the lower elementary grades, as the difficulty level of grade level material and

expectations increases. Educational professionals recognize pros and cons to the Montessori Method and setting for students with disabilities such as ADHD, although the method is designed to be inclusive of students with varying cognitive disabilities as well as other special needs.

Reid (1999) supported that the arrangement and alterations of the physical environment "can have dramatic effects on students' behavior" (para. 7). "Predominantly, however, these strategies were not found to have empirical support" (Lee et al., 2013, p. 2).

2.9 ON-TASK AND OFF-TASK BEHAVIORS

Persistent behavior problems common to students with ADHD have been found to have a detrimental effect in the classroom on academic as well as social performance (DuPaul & Jimerson, 2014). Almeda et al. (2013) cited information stating that, "there is a variety of reasons why loss of instructional time occurs in schools…student inattentiveness (i.e., engagement in off-task behavior during instructional time) is the biggest factor that accounts for loss of instructional time" (p. 2428). In addition to behavior affecting academic performance, the learning environment also affected student behavior (Reid, 1999). As Soleil (1995) observed, "school success or failure depends on 'goodness of fit': how well within-child variables (such as biological predispositions) interact with environmental variables (such as classroom expectations). In the classroom as in the world, biology and environment are interactive" (p. 3). For the past century, researchers and educators have acknowledged that a child exhibiting more off-task behaviors most likely will suffer in educational performance due to loss of instructional time (Almeda et al., 2013). Children with ADHD "exhibit significantly higher rates of

off-task behavior when passive classroom activities (e.g., listening to teacher instruction and reading silently) are required to their non-ADHD classmates" (David, 2013, p. 4).

According to Anderson and Myers (2010), off-task behaviors were commonly defined as, "relatively low-level forms of behavior, such as daydreaming, playing with materials or equipment, talking to others, and wandering around the room" (p. 1). When completing student observations in the traditional and Montessori classroom settings, school psychologists, as practiced and observed by this researcher, often use a combination of formal and informal methods of observation to document behaviors. Formal measures define or code specific behaviors as on- or off-task.

Typically, off-task behaviors documented in informal student observations are similar to behavioral descriptions in the formal measures which include the student appearing to not be completing tasks assigned by the classroom teacher or when the student is not actively engaged in the activity designated by the teacher. Examples of more specific off-task behaviors include fidgeting with objects (e.g. playing with a pencil or eraser), wandering around the room without purpose, being out of seat when not directed, talking inappropriately (not talking about the assigned task), and daydreaming.

In contrast, on-task behaviors documented during student observations often include the student working on an independent assignment, working collaboratively in a group assignment, participating in a teacher-directed activity (e.g., making eye contact and raising hand to answer questions), actively listening (e.g., making eye contact with a teacher or student speaking during a lesson), and following teacher instruction when transitioning from one task to another (e.g., getting out appropriate materials or walking from one location in the room to another). Similarly, Godwin and Fisher (2011)

operationally defined on-task behavior in their study of the effect of classroom environment on student attentiveness in the *Allocation of Attention in Classroom Environments: Consequences for Learning* as "engagement with the teacher or the learning materials (i.e., the book), and engagement was determined by direction of children's [eye] gaze" (p. 2809).

During student IEP or Support Team meetings, specific accommodations and interventions are addressed to help decrease off-task behaviors that, as supported by research, indicate a positive impact on academic performance. Almeda et al.'s *Classroom Activities and Off-Task Behavior in Elementary School Children* (2013) referred to research stating that inattention in students is the single most defining element that attributes to the loss of instruction, noting specifically that off-task behavior negatively affects academic performance and successful learning. Godwin and Fisher (2011) refer to research reporting off-task behaviors during instructional periods range from 25% to 50% of total instructional time.

As Frenette, Perrin, Rene, Sheldrick, and Steiner (2014) noted, "the complex intertwining of ADHD symptoms, executive functioning, and academic skills has led multiple experts in the field to recommend continued close academic and behavioral monitoring at school" (p. 210).

2.10 BEHAVIORAL STUDIES

Lewis, Scott, Wehby, and Wills (2014) argued that "by using direct observation to measure a student's or teacher's behavior, it is necessary to focus on only those behaviors that can be observed and counted" p. 191). In the study, Lewis et al. (2014) pointed out one purpose of using direct observation as being used to recognize behavioral patterns

and identify the "functional relationship between the behavior and environmental events (e.g., attention-maintained problem behavior)" (p. 191). Lewis et al. (2014) discussed interval-based direct observations "whereby the observer records whether the target behavior is present or absent after a prescribed time interval passes (e.g., 15 seconds)" (p. 192). Furthermore, these researchers noted the importance of using a mixed-methods approach versus a single measure for data collection of behavioral data. Lewis et al. (2014) stated:

> As offered in this article, the recommendation is that either approach (teacher rating or direct observation) may provide insight and that researchers and educators should continue to use multiple methods because each has the potential to contribute to the overall picture of the student's functioning. (p. 198)

Another study of student behavior, conducted by Geng (2011) used qualitative research methodology by obtaining data through narrative behavioral observations. Geng (2011) cited that "observation has been used as a 'fundamental basis of all research methods' in the social and behavioral science" (p. 20). The researchers in this study used semi-structured field observations to gather data about instructional strategies used when instructing students diagnosed with ADHD. The sample included six male students, two from each of the three schools. Prior to conducting the observations, the researchers received teacher and parental consent. The students were observed from one to four days, during specific time ranges (e.g., 8:30 a.m.–11:00 a.m.) of classroom instruction with attention to unobtrusiveness on the part of the observer (Geng, 2011). Each of the researchers used the same observation form to record qualitative data for student behaviors, teacher strategies, and student reactions to the teacher's strategies.

Nevin Yildiz (2015) analyzed the behaviors of general education teachers, off-task behaviors of special needs students within inclusive classroom settings, and student engagement. Yildiz's data collection tools included the researcher-designed demographics questionnaire and an observation form to record both teachers' and students' behaviors. Yildiz (2015) also calculated percentages for the analysis of data of the "teachers' and students' behaviors in each of the lessons and the total of the lessons" (p. 181). This study of behaviors used both qualitative and quantitative data to demonstrate the relationship between teacher and student behaviors in an inclusive classroom.

Else-Quest and Lillard (2006) conducted a study of elementary age students from both Montessori and traditional education programs to determine the influence of Montessori education on students both socially and academically. The age groups selected were the "two most widely implemented levels of Montessori education: primary (3- to 6-year-olds) and elementary (6- to 12-year-olds)" (Else-Quest & Lillard, 2006, p. 1893). The groups were selected from students already entered into a school lottery for the Montessori program. The Montessori groups were the experimental groups and "those who were not accepted were assigned to the control (other education systems) group" (Else-Quest & Lillard, 2006, p. 1893). Furthermore, Else-Quest and Lillard (2006) reported that the groups were not evenly balanced in terms of gender; however, "gender did not contribute significantly to any of the differences reported" (p. 1893). Standardized measures–the third editions of the Woodcock Johnson Tests of Cognitive Abilities and the Woodcock Johnson Tests of Achievement–were used to gather data of cognitive ability and academic achievement for the students in the study. Observations

and a series of stories about social conflicts in which the students were asked to provide resolutions were used to gather social and behavioral skills data. Using mixed methods, Else-Quest and Lillard (2006) determined that "Montessori education fosters social and academic skills that are equal or superior to those fostered by a pool of other types of schools" (p. 1894).

Rathunde (2003) conducted a study of student motivation, quality of experience, and social context by examining middle school students from both Montessori and traditional schools. His sample size included approximately 150 students in grades sixth and eighth from five Montessori schools and approximately 400 sixth and eighth grade students from 20 traditional middle schools. In the early preparation phase of the study, Rathunde (2003) used questionnaires to gather demographical information. After recognizing vast differences between the socioeconomic status and family dynamics of the two groups, he narrowed down the sample by selecting a subset of schools "that matched the primarily European American and higher socioeconomic status (SES) status of the Montessori students" (p. 22). The students themselves were directly involved in the study as they were required to record responses eight times per day on a form with questions regarding "what they were feeling at the moment, where they were, what they were thinking about, and other questions about their momentary experience," using a technique called the Experience Sampling Method (pp. 23–24). The students also completed questionnaires to provide further background information. Then, for two areas of the Experience Sampling Method, "Flow" and "Undivided Interest," a "percentage value for each of the above variables was computed for academic and non-academic contexts at school" (p. 25). Multivariate analysis of covariance (MANCOVA) was the

statistical procedures used to analyze the data. Rathunde (2003) argued that "such an approach attempts to verify that school-related differences found between the Montessori and traditional students are not related to differences in the students' grade level, education of their parents, ethnic background or gender" (p. 26). In the study results, Rathunde (2003) provided that,

> While engaged in academic work at school, Montessori students reported higher affect, potency (feeling alert and energetic), intrinsic motivation (enjoyment, interest), and flow experience than students from traditional middle schools. The traditional students did report higher salience (feelings of importance for their futures). (p. 40)

In review of this study, it is noted that the researcher used mixed-methods by gathering data from parent and student questionnaires and calculated percentages for areas of assessment from the Experience Sampling Method.

Almeda et al. (2013) conducted research of off-task behaviors of elementary students in relation to classroom activities and instructional strategies. The researchers used a sample of elementary students from 22 classrooms with grades ranging from kindergarten through fifth. In addition, skilled observers coded on and off task behaviors during four observation periods. Furthermore, these researchers defined "on-task" as the student directly looking at the teacher or instructional materials/activity explaining that "eye gaze is a common measure of visual attention" and that "it is arguably a reasonable (albeit imperfect) measure of focused attention" (Almeda et al., 2013, p. 2429). Likewise, Almeda et al. classified the student as being off-task if they were looking at objects or persons not related to the lesson or source of instruction. In this study, specific

off-task behaviors (e.g., self-distraction, environmental distraction) and instructional formats (e.g., individual work, small-group work) were coded and used for data analysis (2013). Almeda et al. also gathered descriptive, qualitative data in terms of describing instructional strategies, student behaviors and classroom environment as well as quantitative, statistical data. The researchers "predicted student on-task behavior using a regression tree algorithm, which sets up a decision tree to predict a numerical value" (Almeda et al. 2013, p. 2430).

Data for the present action research study was collected using a small sample population of male and female second- and third-grade students diagnosed with ADHD from three elementary schools in a rural public school district in South Carolina. The sample included an equal number of students with ADHD attending both traditional classroom instructional settings and Montessori instructional classroom settings. Similar to behavioral studies previously reviewed in this chapter, a mixed-methods action research design was conducted using both quantitative and qualitative measures to strengthen the validity of research findings. These measures included questionnaires, interviews, narrative observations, field notes, time sampling observations, and curriculum based measurements. On- and off-task behaviors were coded on the time sampling observation forms using codes pre-determined by the BOSS in addition to codes customized by this researcher.

CHAPTER 3: ACTION RESEARCH METHODOLOGY

3.1 INTRODUCTION

Numerous studies exist regarding the effect of classroom behaviors and ADHD on academic performance and on defining on- and off-task behaviors in the classroom. Research is also available addressing ADHD specifically in a Montessori classroom setting. However, in this researcher's review of available literature, little research was found delving into the prevalence of on- and off-task behaviors in a traditional classroom setting versus a Montessori setting. As a school psychologist serving students with special educational needs such as ADHD, pursuing this area of interest in a mixed methods action research design was beneficial to this researcher's area of practice, as well as parents, teachers, and administrators within the Oakland School District.

3.2 STATEMENT OF PURPOSE AND PROBLEM OF PRACTICE

The purpose of this study was to explore the potential impact the traditional classroom structure versus Montessori classroom structure may or may not have on elementary age students diagnosed with ADHD. This will be addressed by examining the differences between on-task and off-task behaviors of students diagnosed with ADHD in each of the two settings in a public school district in South Carolina that offers both methods of instruction. This research setting included three elementary schools in the Oakland School District. The three elementary schools, referred to in the study as Longview Elementary School, East Bridge Elementary School, and Hampton Elementary

School offered both traditional and Montessori instructional tracks for preschool through fifth grade. As a school psychologist, this researcher often consults with teachers and parents, leads professional development sessions, and participates in student planning and intervention meetings. In addition, the researcher observes students frequently to gather observational data regarding student behaviors, teacher and peer interactions and the student's ability to complete classroom tasks, follow directions, and transition appropriately. These observations occur in traditional as well as Montessori classroom settings. The fact that Oakland School District offers two choices of instructional tracks for preschool through eighth grade, parents and educators often question which setting is more beneficial for a student and his/her individual learning needs. This is especially common for students with diagnoses impacting educational performance such as ADHD.

Research questions. The data gathered for this study was analyzed to address the following two questions:

1) What are the behavioral differences displayed in elementary students diagnosed with ADHD in a traditional classroom structure as opposed to a Montessori classroom structure?
2) What are the differences in academic achievement in the traditional sample as opposed to the Montessori sample as measured by grade level Curriculum Based Measurements (CBM)?

3.3 ACTION RESEARCH DESIGN

The use of both quantitative and qualitative data collection methods strengthened the study by providing a more comprehensive picture of the research topic. Albert, Levinson, and Lingard (2008) argue that "central to the effectiveness of a mixed methods

study is a clear and strategic relationship among the methods in order to ensure that the data converge or triangulate to produce greater insight than a single method could" (p. 460). These measures included narrative and time-sample observations, semi-structured interviews, questionnaires, CBMs, and field notes.

The plan for this action research study was first proposed to the superintendent of Oakland School District. Following approval to pursue the study, the researcher consulted with the principals of Longview Elementary School, East Bridge Elementary School, and Hampton Elementary School to explain the plan for the study and to obtain permission to work with a minimum of two classroom teachers in each school – one from a traditional classroom setting and one from a Montessori classroom. The researcher also obtained permission from the principals to send home parent questionnaires to the parents of students in each of the two settings. The results of these initial questionnaires were used to identify students who met the criterion required for the study sample. A follow-up letter was then sent home to a smaller group of students in order to gain parental consent for selected students to be included in the study.

3.4 DESCRIPTION OF THE CONTEXT

Behaviors of students diagnosed with ADHD within the classroom context are fundamental to this study. Research supports that on-task behavior in children with ADHD is "highly context dependent" and is a result of the interactions between the characteristics of the child and the environmental limitations (Antrop et al., 2013, p. 488). In this action research study, on-task and off-task behaviors of children with ADHD were observed within the naturalistic classroom environment in both traditional classroom and Montessori classroom contexts.

Elementary Montessori environments are structured by mixed age classrooms– children ages six to nine and children ages nine to 12 (Lillard, 1988, p. 78). This structure promotes "accelerated social-emotional growth and increased exposure to language" (*The Montessori Classroom*, n.d.). The American Montessori Society (2015a) *Introduction to Montessori* article states:

> Multiage groupings are a hallmark of the Montessori Method: younger children learn from older children; older children reinforce their learning by teaching concepts they have already mastered. This arrangement also mirrors the real world, where individuals work and socialize with people of all ages and dispositions. (para. 5)

Activities are presented to the students in small groups "in a manner that appeals to their imagination by using clear and visible symbols" (Lillard, 1988, p.80). This instructional approach is then followed by individual exploration and repetition at each child's individual pace with the teacher encouraging the student until the skill is mastered. The students are allowed freedom to explore other activities during their learning periods as well; teaching the children to make choices encouraged by their natural curiosity. According to the American Montessori Society (2015a), "the child, through individual choice, makes use of what the environment offers to develop himself, interacting with the teacher when support and/or guidance is needed" (para. 4). The Montessori environment is designed for each student to work at his/her own pace. As Lopata et al. (2005) pointed out, "because each child's development is different, the individual child is allowed to choose activities, trusting the child's sensitive periods will guide him to choose the work for which he is ready" (p. 2).

The traditional classroom setting consists of one grade level per classroom and includes instructional methods of whole-group instruction, individual seatwork, and group assignments. The arrangement of desks in the traditional classes varies with some classrooms arranged in groups, in pairs, or in rows. Lopata et al. (2005) stated that in conventional classroom settings, "students follow teacher-directed work" while in the Montessori classroom structure, "students typically spend three to four hours per day in self-selected individual and small-group work and spend less than one hour per day in whole-group instruction" (p. 2). Consistent with the conventional classroom description given by Lopata et al., the teachers of the traditional classes in Oakland School District direct the students as to what activity to complete and lead lessons rather than students having the freedom to choose lessons throughout the class period. Cooper (2016) observed that:

> A traditional or typical elementary classroom has students all in the same grade, one teacher and… Students learn by listening to their teachers, memorizing information and practicing drills and skills. Traditional classrooms usually have a sense of order, a set schedule and standard grading. (para. 1)

There are some variations to this structure in traditional classrooms in Oakland School District as well as the more contemporary 21st-century traditional classroom in general. Although the traditional classes still include students in one grade level and one teacher, a group of teachers and administrators involved in a project called, Speak Up (2010) argued that the curriculum and structure of the traditional class still promotes student collaboration, creativity, and critical thinking skills, especially with the evolving use of technology in the classrooms. The Speak Up study provided, "teachers tell us that

as a result of using technology in the classroom students are more motivated to learn…apply their knowledge to practical problems…and take ownership of their learning" (p. 2).

3.5 PARTICIPANT SELECTION

First, this action research study was approved by the Institutional Review Board at the University of South Carolina. Prior to selecting participants, the plan for the study was presented to the district's superintendent to obtain permission to move forward with implementing the study. The researcher then obtained permission from the principals of the three elementary schools to work with one or more classroom(s) in each school setting. The sample for this study included five students with ADHD from traditional third grade elementary classrooms and five second- and third-grade students with ADHD from lower elementary Montessori classrooms chosen from the three elementary schools.

The criteria for the selected students included students who have been diagnosed with ADHD per parent report and who have been enrolled in either of the specific classroom structures since kindergarten. As seen in Figure 3.1, a questionnaire was distributed to all of the parents/guardians of the second- and third-grade students in the selected traditional classrooms as well as second and third graders in lower elementary Montessori classrooms to identify the students who meet the criteria. The information acquired from the returned questionnaires helped eliminate those students who had transitioned from one setting to another at some point during their educational career. In addition, the information gathered from the completed questionnaires was used to identify a minimum of 10 students for the sample.

In continuation of Phase 1, the researcher contacted the parents of the selected group of participants by sending home a letter explaining in detail the purpose of the study as well as the extent of the student involvement (see Figure 3.1). The letter advised parents that the students, if chosen for the study, would be observed in their natural setting and would not be required to directly interact with the researcher nor will they be identified by name in the study. Furthermore, parents were informed that confidentiality and ethics guidelines would be adhered to. The letter stated that the results of this study will be shared with the parents upon conclusion of the research. These parents were asked to provide consent by signing the enclosed consent form with the informational letter for their child to be included in the sample.

3.6 PARTICIPANTS

In Phase 1, a small sample of 10 second- and third-grade students with ADHD was selected for this study. A preliminary questionnaire was used to gather student information from parents and guardians and to identify an equal number of students diagnosed with ADHD from a traditional classroom and a Montessori classroom who met the selection criterion for the study. The questionnaire also included a section that provided demographic information for each of the students included. A total of 10 completed and returned questionnaires happened to meet the selection criteria to be selected for the sample. Like the alias names assigned to the district and the schools, both students and teachers were assigned pseudonyms that are used throughout the study to protect the identity of the participants and settings.

The identifying and demographic information, as shown in Table 3.1, included the students' ages, grades, and races. Table 3.1 indicated a "Y" for "Yes" and an "N" for

"No" as to whether or not each student had ever been retained in school (i.e., repeated a grade), and/or was taking a medication prescribed to treat symptoms of ADHD at the time of the study. Additional pertinent information gleaned from the *Parent/Guardian Questionnaire* included whether or not each student received any academic services such as specialized instruction and/or accommodations provided by an IEP, 504 Student Accommodations plan, or participation in a formal intervention group, all of which were reported by each student's parent/guardian on the questionnaire. The following descriptions of each student in the study include the source of the diagnosis of ADHD as well as the approximate age when the student was diagnosed.

Table 3.1

Demographic Characteristics and Identifying Information of Participants

Participant	Age	Grade	Gender	Race	Retained	Academic Services	Medication
Student A (T)	9	3rd	F	Black	N	N	Y
Student B (T)	8	3rd	F	White	N	N	Y
Student C (T)	9	3rd	M	White	Y	N	N
Student D (T)	8	3rd	M	Black	N	N	Y
Student E (T)	8	3rd	M	White	N	N	Y
Student A (M)	9	2nd	F	White	Y	Y	Y
Student B (M)	9	2nd	F	White	Y	Y	Y
Student C (M)	8	2nd	M	White	Y	Y	Y
Student D (M)	8	2nd	F	Hispanic	N	N	Y
Student E (M)	9	3rd	M	White	N	N	Y

Participants from Traditional classes. The sample selected from the traditional classrooms included five third-grade students, two females and three males. One out of the five students from the traditional setting had been retained. Four out of the five

students were reported as taking medication prescribed for symptoms of ADHD at the time of this study. In addition, no student in the group attending traditional classes was identified as receiving any academic or special education services.

Student A (Traditional [T]). Student A (T), an African American female, was nine years old at the time of this study. She had attended school in the traditional classroom setting since kindergarten and had never been retained. Student A (T) received all core instruction on grade level curriculum in a third grade classroom. She did not receive any additional, specialized instruction, such as instruction provided for students with an IEP. According to parent information provided on the *Parent/Guardian Questionnaire*, a pediatrician diagnosed Student A (T) with ADHD at approximately age 7 years. In addition, her parent reported that she was taking a prescribed medication at the time of this study.

Student B (T). Student B (T) is a Caucasian female who was eight years old at the time of this study. Information obtained from her *Parent/Guardian Questionnaire* provided that Student B (T) had never been retained and had attended school in the traditional classroom since enrolling in school. At the time of this study, she also received all core instruction on grade level in the general education classroom. Student B (T) did not receive any supplementary specialized instruction or academic services. Parent report additionally provided that Student B (T) was diagnosed with ADHD by a family physician at approximately 4 years old. Information provided on the questionnaire also provided that she was taking a prescribed medication to treat symptoms of ADHD at the time of this study.

Student C (T). Student C (T), a Caucasian male, was nine years old at the time of this study. Information reported by his parent/guardian provided that he had attended school in the traditional classroom setting since kindergarten and that he has been retained. Student C (T) received instruction using grade level curriculum for all core subjects and did not receive any additional academic support or specialized instruction. He was diagnosed with ADHD by a pediatrician and clinical psychologist at approximately age 7 years, as reported in the *Parent/Guardian Questionnaire*. According to the questionnaire, he was not taking a medication prescribed for symptoms of ADHD at the time of this study.

Student D (T). Student D (T), an African American male, was 8 years old at the time of this study. According to information provided on his *Parent/Guardian Questionnaire*, Student D (T) had attended school in a traditional classroom setting since beginning school in kindergarten and had never been retained. He received all core instruction on grade level in a general education third grade classroom. He did not receive any specialized instruction or academic support in addition to the general education instruction. Student D (T) was diagnosed with ADHD by a pediatrician at approximately age 7 years, per parent report. According to his *Parent/Guardian Questionnaire*, he was taking a medication prescribed for symptoms of ADHD at the time of this study.

Student E (T). Student E (T), a Caucasian male, was eight years old at the time of this study. Information provided on the *Parent/Guardian Questionnaire* included that he had attended school in the traditional classroom setting since kindergarten and had never been retrained. He received all core instruction in a general education, third grade

class on grade level. The parent report provided that he did not receive any additional academic support or specialized instruction. In addition, parent reported information provided that he was diagnosed with ADHD by a pediatrician at approximately five years old. According to his *Parent/Guardian Questionnaire*, he was taking a medication prescribed for symptoms of ADHD at the time of this study.

Participants from Montessori classes. The sample of students selected from the lower elementary Montessori classroom setting included four second-grade students and one third-grade student. This group consisted of three females and two males. Three of the five students in this group had been retained (repeated a grade) since five-year-old kindergarten. All five students in the group attending Montessori classes were reported as taking medication prescribed for symptoms of ADHD at the time of this study. Three of the five students in the Montessori group were identified as receiving additional academic services. Two of the second grade females, Students A (M) and B (M) were receiving specialized instruction through an IEP and one of the second grade males, Student C (M), was participating in a reading intervention program called "Reading Recovery" at the time of the study.

Student A (Montessori [M]). Student A (M), an Caucasian female, was nine years old at the time of this study. She had attended school in the Montessori classroom setting since kindergarten and had repeated a grade. Student A (M) received core instruction on grade level curriculum in a general education lower elementary Montessori classroom for the majority of the school day. In addition to the core general education curriculum, she received specialized instruction through an IEP in a "Resource" (i.e., small group) setting. According to parent-reported information provided on the

Parent/Guardian Questionnaire, Student A (M) was diagnosed with ADHD by a pediatrician at approximately seven years of age. In the questionnaire, her parent provided that she was taking a prescribed medication to treat symptoms of ADHD at the time of this study.

Student B (M). Student B (M) is a Caucasian female who was nine years old at the time of this study. Information obtained from her *Parent/Guardian Questionnaire* provided that Student B (M) had been retained and had attended school in the Montessori classroom since enrolling in school. At the time of this study, she received core instruction on grade level in the general education classroom for the majority of the school day. In addition to general education instruction for core academic areas, Student B (M) received specialized instruction through an IEP in a small group, "Resource" setting. Parent reported information further provided that Student B (M) was diagnosed with ADHD by pediatrician at approximately 7 years old. Her parent reported that she was taking a prescribed medication to treat symptoms of ADHD at the time of this study.

Student C (M). Student C (M), a Caucasian male, was eight years old at the time of this study. Information reported by his parent/guardian provided that he had attended school in the Montessori classroom setting since kindergarten and had been retained since 5-year kindergarten. Student C (M) received instruction in the grade level curriculum for all core subjects. He also received additional academic support as he participated in the "Reading Recovery" reading intervention program. He was diagnosed with ADHD by his pediatrician at approximately 6 years of age, as reported in the *Parent/Guardian Questionnaire*. According to his *Parent/Guardian Questionnaire*, he was taking a medication prescribed for symptoms of ADHD at the time of this study.

Student D (M). Student D (M), a Hispanic female, was eight years old at the time of this study. According to information provided on her *Parent/Guardian Questionnaire*, Student D (M) had attended school in a traditional classroom setting since beginning school in kindergarten and had never been retained. She received all core instruction on grade level in a general education lower elementary Montessori classroom. She did not receive any specialized instruction or academic support in addition to the general class instruction. Student D (M) was diagnosed with ADHD by a pediatrician and clinical psychologist at approximately 5 years old, per parent report. According to the information provided on the *Parent/Guardian Questionnaire*, she was taking a medication prescribed for symptoms of ADHD at the time of this study.

Student E (M). Student E (M), a Caucasian male, was age nine years at the time of this study. Information provided on the *Parent/Guardian Questionnaire* included that he had attended school in the Montessori classroom setting since kindergarten and had never been retained. He received all core instruction in a general education lower elementary Montessori class on grade level. The parent report provided that he did not receive any additional academic support or specialized instruction. In addition, parent reported information provided that he was diagnosed with ADHD by a pediatrician at approximately age 4 years. According to his *Parent/Guardian Questionnaire*, he was taking a medication prescribed for symptoms of ADHD at the time of this study.

3.7 POSITIONALITY

The practitioner-researcher must examine her relationship with the context and participants of this study. The researcher is a school psychologist serving all of the schools and students in grades preschool through adult education in the Oakland School

District. The researcher is a full-time, district-level employee, working with all schools in the district, with an office housed within the District Office. This school psychologist consults and works collaboratively with principals, guidance counselors, teachers and interventionists at each school. Among the numerous reasons for consulting and participating in meetings include assessment of educational disabilities, student behaviors, academic concerns, Individualized Education Plans, and Section 504 Student Accommodation Plans. In addition, this school psychologist is involved in leading and organizing professional development sessions for special education teachers, administrators and guidance counselors. As a leader in professional development, assessment and instructional plans for students with special needs, information gathered in this action research study will be of further benefit to share in meetings with principals and other educators because, as Duke and Stiggins (2008) note, "there is a universal agreement that principals can play a pivotal role in the improvement of student learning" (p. 285).

In *The Role of Special Education Training in the Development of Socially Just Leaders*, Cole and Pazey (2013) stressed the importance of training in special education law for every teacher and administrator, not just those working specifically with special education. They also advocated parent and student awareness of their rights and the services available to them under the law. In other words, "'Equity consciousness' occurs when leaders understand that all children can achieve academic success, regardless of race, social class, gender, sexual orientation, learning differences, culture, language, and so forth" (Cole & Pazey, 2013, p. 179). The population of children with disabilities is not limited to one class, race, or gender. Social justice is one of the main concerns in current

educational policy, but sparse research in special education and special education law suggests that educational leadership needs "the knowledge, skills, and attributes necessary for engaging in 'social justice leadership' for each student" (Cole & Pazey, 2013, p. 186).

This researcher recognized the significance of positionality in the research process. Both the researcher and the participants have the potential to affect the research process through their own identities and perceptions. As the researcher is the means for data collection in qualitative research, this researcher must be cognizant that personal beliefs and values have the capability of influencing the research process. In an educational leadership role, this researcher must also recognize personal bias and perceptions when reflecting and sharing the implications of this study. This researcher endeavored to remain objective in every aspect of this research process, as well as to be aware of personal biases, understanding that the strength of any action research process is influenced by the relationship between the researcher, participants, and those who will benefit from the results of the study.

Anderson and Herr (2015) observed that "much action research is centrally concerned with the issues of relationship between outsiders and insiders, since clarity about them is necessary for thinking through issues of research validity or trustworthiness, as well as research ethics" (p. 37). As an insider studying a group of students within a setting in which the researcher works, she must recognize certain limitations. While the teachers in this study were aware of the researcher's role the students were typically unaware of her position. In this particular school district, the students were familiar with this researcher's presence as she often came in and out of

their classrooms during the school year and therefore did not seem to view her presence as a distraction. The researcher was unobtrusive and observed selected students in their natural setting. Confidentiality was upheld, as the names of the students being observed were not shared with the teachers, and aside from the parents' knowledge via signed consent for their child to possibly be in the sampling, the students were not directly aware of their participation in the study. One possible limitation to consider, as previously mentioned, was that an individual teacher's actions may have been influenced by this researcher's presence as an observer in the room. Prior to beginning the observation periods, the researcher made clear to the teachers involved that the focus was not on observing their instruction; rather it was on the individual students in the sampling and their behaviors within the environment.

3.8 RESEARCH ETHICS

In educational research the standards of ethics are essential to consider when working with children, families and colleagues within the institute of education. Mertler (2014) addressed this issue by stating that "making sure that action research adheres to the ethical standards is a primary responsibility of the educator-researcher" (p. 106). As a school psychologist, this researcher not only adheres to the code of ethics outlined for educators, such as the *National Education Association's (NEA) Code of Ethics*, but she also adheres to the *National Association of School Psychologists (NASP) Principles for Professional Ethics* specific to her job. The NASP (2010) *Principles for Professional Ethics* states the following:

> School psychologists engage only in professional practices that maintain the dignity of all with whom they work. In their words and actions, school

psychologists demonstrate respect for the autonomy of persons and their right to self-determination, respect for privacy, and a commitment to just and fair treatment of all persons. (p. 3)

This guiding principle is consistent with other ethical standards outlined by the *NEA Code of Ethics* in that it focuses on the self-respect of all individuals and recognizes the importance of protecting the privacy and rights of all persons involved. In addition to professional commitment, the *NEA Code of Ethics* highlights a second principle in regard to a commitment to the students which states that, "the educator strives to help each student realize his or her potential as a worthy and effective member of society" (National Education Association [NEA], 2013, p. 431). In serving professionally as an advocate for students, as well as their parents/legal guardians, and considering the researcher's primary ethical responsibilities, this researcher examined her topic of interest, data collection methods, and potential participants to ensure that unethical threats did not impede the dignity, privacy, and autonomy of all involved.

Initially, the researcher recognized that her interest in on-task and off-task behaviors between two different classroom settings was geared toward being as unobtrusive as possible by using observations within the natural settings as her primary methods of data collection. This study was designed to cause no physical or emotional harm to any participant involved. Prior to beginning the study, the researcher first obtained permission to pursue the proposed action research study from the district superintendent. Second, approval for school sites was obtained from the principals and the classroom teachers in the selected elementary schools, as this was essential for the researcher to gain cooperation from the faculty involved for interviews as well as

enabling the researcher to be a welcomed observer in the selected classrooms. Given that the researcher's plans focused on elementary-age students, she distributed parental consent forms to the parents and legal guardians of the students selected for the study. However, in order to identify students to whom this study is applicable, the researcher developed a parent letter which explained the essential components of the study and included a brief preliminary parent questionnaire to help with the identification of the target sample of students to be observed. The researcher was interested in selecting second- and third-grade students who had been formally diagnosed with ADHD, according to parent report in the initial questionnaire. Therefore, the researcher adhered to district policy for obtaining such information before inquiring about this information in the letter distributed to parents. In addition to these criterion, the researcher also identified those who had been enrolled in the particular setting (i.e., traditional or Montessori) since kindergarten in an effort to eliminate potential behavioral effects of recent transitioning from one setting to the other. The participants in the sampling did not directly participate or interact with the researcher as the researcher collected data through documenting behavioral observations of the children within their natural classroom environment.

3.9 DATA COLLECTION AND ANALYSIS

Two key purposes of the action research method, as described by Mills (2011), include "(1) seeking out aspects in teaching as a means for increasing knowledge and (2) improving practice" (p. 261). Gathering data from multiple sources and using varying methods for the topic of interest was beneficial for this researcher as this process to help ensure validity of the data gathered. A common practice for collecting trustworthy data

is through "triangulation or the use of multiple data sources, multiple data-collection methods, and perhaps even multiple teacher-researchers in order to support the ultimate findings from the study" (Mertler, 2014, p. 137). Triangulation was completed through the use of mixed-methods for this study.

Procedure. The study took place over the course of one semester; the spring semester of the 2016-2017 school year. Teachers were interviewed at times predetermined by the teacher and researcher, most of which were scheduled during teacher planning periods. One teacher completed the interview electronically due to scheduling conflicts. Students selected for the study were observed at varying times, both morning and afternoon, during core instructional periods which included reading, writing, and mathematics.

After obtaining permission to pursue the study, the researcher met with each of the teachers and completed semi-structured interviews in Phase 1 of the study. These interviews were recorded and used to gather information regarding the teachers' perspectives of the setting in which the teacher instructed students and to gain additional insight in regard to the setting, instructional method and the teacher's view of students' commonplace behaviors in the setting.

The qualitative measures used to gather data included a parent/guardian questionnaire, semi-structured interview transcripts, field notes, and narrative observation notes. The initial parent/guardian questionnaire was used to collect detailed information regarding the criterion for the sample population. The researcher filtered through the returned questionnaires to select the students who met the criterion needed for the study. The main criterion included the following: (1) the student has been diagnosed with

ADHD by a medical professional, clinical professional, or school psychologist, per parent report; (2) the student is enrolled as a second or third grader; (3) the student has consistently attended the classroom structure (i.e., traditional or Montessori) since kindergarten, without switching from one setting to the other. In addition, the semi-structured interviews with the classroom teacher from each setting were audio recorded for transcript accuracy. As shown in Appendix D, interviews consisted of a mixture of closed- and open-ended questions asking the teacher about his/her classroom structure and class expectations. This data assisted the researcher in defining what behaviors are considered "on-task" within the particular setting in accordance with the teacher's expectations and classroom rules.

Qualitative and quantitative observational data were also collected on each student selected for the study. Additional quantitative data was gathered in Phase 3 using an academic achievement measure called CBM for reading, writing, and mathematics. Percentiles for the benchmark period and grade levels that corresponded with the national norms for *Aimsweb 2.0* were recorded for each student in the sample from both the Montessori and traditional classroom settings.

In Phase 2, narrative observation notes regarding specific details of student behaviors and interactions within the classroom setting during core instructional time was collected for two 30-minute observation periods for each student. As for the quantitative measure, a time-sampling behavior observation form from the BOSS was used for an additional seven observation periods per student to collect data specifically on the on- and off-task behaviors exhibited by each child within the classroom setting during core instructional time. Student behaviors were recorded at predetermined intervals for 15

minutes. The data was then used to calculate the percentage of time on-task and time off-task for each student in the sample.

Data collected was organized and categorized in correspondence with the two main research questions. Descriptive words and phrases were used to code data and patterns that emerge throughout the observations. For example, in the narrative observations, if the researcher documented that a student was "writing notes," "following along in the text," or "participating in the class/group discussion" then those recorded behaviors were coded according to the BOSS codes (Table 3.2) for being either actively or passively engaged. In contrast, if the notes provided that the student was "fidgeting with a marker," talking when it was not warranted, getting up out of the seat at times it was not for a purpose related to the class activity, then those behaviors were coded as one of the three off-task categories defined by the BOSS (e.g., motor, verbal, or passive). Thus, as Saldana (2013) notes, "qualitative inquiry demands meticulous attention to language and deep reflection on the emergent patterns and meanings of human experience" (p. 10).

Patterns emerged from a detailed review of narrative observation and field notes collected during the student observation periods. The details of the observations were analyzed and patterns categorized using the BOSS behavioral codes as seen in Table 3.2 and in correspondence with research questions. Furthermore, the researcher triangulated the data collected and compared across measures to look for consistencies and inconsistencies. The data was analyzed continually throughout the study as well as after the data collection process. Both the narrative and time-sampling observation data were coded using codes from the *BOSS User Guide* (2013) as well as researcher-created codes

(see Table 3.2). In addition, the settings/activities in which the students are observed will be coded using the *BOSS User Guide* (2013) and researcher-created codes (listed in Table 3.3).

Table 3.2

Codes for on-task and off-task behaviors

On-Task Behavior		**Off-Task Behavior**	
AET	Active Engaged Time	**OFT-M**	Off-Task Motor
PET	Passive Engaged Time	**OFT-V**	Off-Task Verbal
		OFT-P	Off-Task Passive

Table 3.3

Codes for observational settings

Observational Setting	
ISW:Tpsnt	Target student – individual seatwork: Teacher present and circulating the room
ISW:TSmGp	Target student – individual seatwork: Teacher – working with a small group of which the target student is not a part of
SmGp:Tpsnt	Target Student – part of a small group with which the teacher is working Teacher – present and working with the small group of which the student is a part of
LgGp:Tpsnt	Target Student – part of a large group with which the teacher is instructing Teacher – present and working with the large group

Note. ISW:Tpsnt = Individual Seatwork: Teacher Present; ISW:TpSmGp = Individual Seatwork: Teacher Small Group; SmGp:Tpsnt = Small Group: Teacher Present; LgGp:Tpsnt = Large Group: Teacher Present.

The time on-task, referred to as "Academic Engagement" in Pearson's (2013) *BOSS User Guide*, is coded using the acronyms of the two subcategories described by the

user guide: AET for Active Engaged Time and PET for Passive Engaged Time. The researcher determines the duration of the observation and sets the interval for the observation. The duration of each time-sample observation for this study was 15 minutes and the behaviors were recorded for a total of 30 intervals during each observation (every 30 seconds). The *BOSS User Guide* (2013) defines AET as "those times when the student is actively attending to the assigned work" (Pearson, 2013, p. 6). Examples of AET behaviors as outlined by Pearson's (2013) *BOSS User Guide* include the following:

- Writing
- Reading aloud
- Raising a hand
- Talking to the teacher about the assigned material
- Talking to a peer about the assigned material
- Looking up a word in a dictionary (p. 6)

Additional behaviors coded by the researcher as AET include the target student actively participating with a partner or small group in an assigned activity or retrieving materials for an assigned task (e.g., walking to a cubby/desk for a pencil box). The *BOSS User Guide* (2013) defines PET as "those times when the student is passively attending to assigned work" (Pearson, 2013, p. 6). The *BOSS User Guide* lists the following examples of PET:

- Listening to a lecture
- Looking at an academic worksheet
- Silently reading assigned material
- Looking at the blackboard during teacher instruction

- Listening to a peer respond to a question (p. 6)

Off-task behaviors are recorded into three categories: Off-Task Motor (OFT-M), Off-task Verbal (OFT-V), and Off-Task Passive (OFT-P). OFT-M is coded when the target student is observed engaging in physical activity that is not related to the activity/assignment assigned by the teacher. The *BOSS User Guide* provides the following examples of OFT-M:

- Engaging in any out-of-seat behavior (defined as buttocks not in contact with the seat)
- Aimlessly flipping the pages of a book
- Manipulating objects not related to the academic task (e.g., playing with a paper clip, throwing paper, twirling a pencil, folding paper)
- Physically touching another student when not related to an academic task.
- Bending or reaching, such as picking up a pencil on the floor
- Drawing or writing not related to an assigned academic activity
- Turning around in seat, oriented away from the classroom instruction
- Fidgeting in seat (i.e., engaging in repetitive motor movements for at least 3 consecutive seconds) while not on task (p. 7)

The *BOSS User Guide* defines OFT-V "as any audible verbalizations that are not permitted and/or are not related to an assigned academic task" (Pearson, 2013, p. 7). Examples of OFT-V include:

- Making any audible sound, such as whistling, humming, forced burping
- Talking to another student about issues unrelated to an assigned academic task

- Talking to another student about an assigned academic task when such talk is not prohibited by the teacher
- Making unauthorized comments or remarks
- Calling out answers to academic problems when the teacher has not specifically asked for an answer or permitted such behavior (Pearson, 2013, pp. 7-8)

Inactive off-task behaviors include times when the target student is staring and/or appears unengaged. Such behaviors are recorded as OFT-P. In addition, according to Pearson (2013), OFT-P is recorded "when a student is passively not attending to an assigned academic activity for a period of at least 3 consecutive seconds" (p. 7) and "when a student is quietly waiting after the completion of an assigned task, but is not engaged in an activity authorized by the teacher" (p. 7). Several examples of OFT-P include:

- Sitting quietly in an unassigned activity
- Looking around the room
- Staring out the window
- Passively listening to other students talk about issues unrelated to the assigned academic activity (Pearson, 2013, p. 8)

The researcher also coded OFT-P at times when the student appeared to be staring blankly in a certain direction or staring at other students in the room.

Reflection. Upon completion of the action research study, the researcher reflected on the results and analysis of the data as this process "provides opportunities for reflecting on where your action research has taken you, reflecting on what you have learned from engaging in action research and…reflecting on where your action research can take you as you move forward" (Mertler, 2014, p. 214). Reflection is an essential

component of action planning as the researcher is able to reflect upon the results, expected and unexpected, determine any revisions that need to be made to the study, and to decide how results may be utilized and shared with educators, parents and/or students, such as in professional development sessions. The researcher identified potential improvements in the methodology used during the reflection process.

3.10 PLAN FOR DEVISING ACTION PLAN

This chapter provides an overview of the design of the study, methodology and data analysis. The study took place in three elementary schools in Oakland School District. The elementary schools serve students in preschool through fifth grade and offer both traditional and Montessori instruction for every grade. A mixed methods approach was implemented as the researcher incorporated qualitative and quantitative measures to collect data on a small group of second and third grade students diagnosed with ADHD from both the traditional and the Montessori classroom settings. The data gathered was triangulated to compare and contrast across measures. Codes were also used to sort on-task and off-task behaviors within categories and to analyze data for emergent patterns. Check and Schutt (2012) argue for using mixed methods because

> The important thing to understand is that no one data source can give you a whole and accurate picture of what is happening. Teacher researchers need multiple perspectives, represented by a range of data collection techniques, to illustrate different aspects of the same question or problem. (p. 267)

Following reflection, the researcher's plan for devising an action plan is to encourage similar future research in this school district as both parents and educators need additional knowledge in choosing the more appropriate instructional options for their

children. The action plan will include sharing results with teachers, administrators, parents, and other educational leaders in professional development sessions as well as in the community in the district in which the study was implemented. Building from this action research, future studies might include, for example, additional grade levels, larger sampling, and observations during different time periods in a school year to increase the validity of the study of the prevalence of on- and off-task behaviors in children diagnosed with ADHD in a traditional classroom environment as opposed to a Montessori classroom environment.

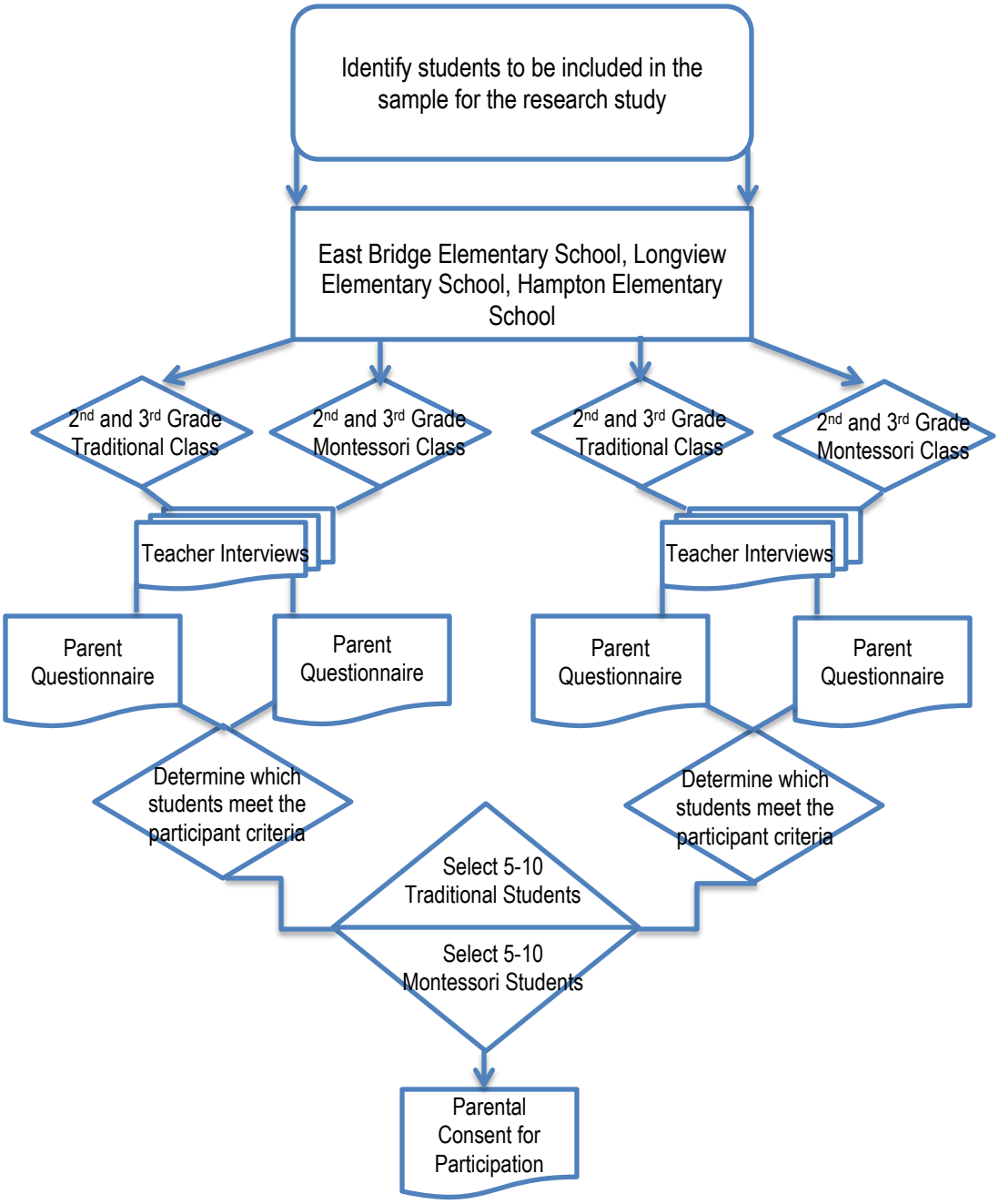

Figure 3.1 Flow-chart for Phase 1 of the research

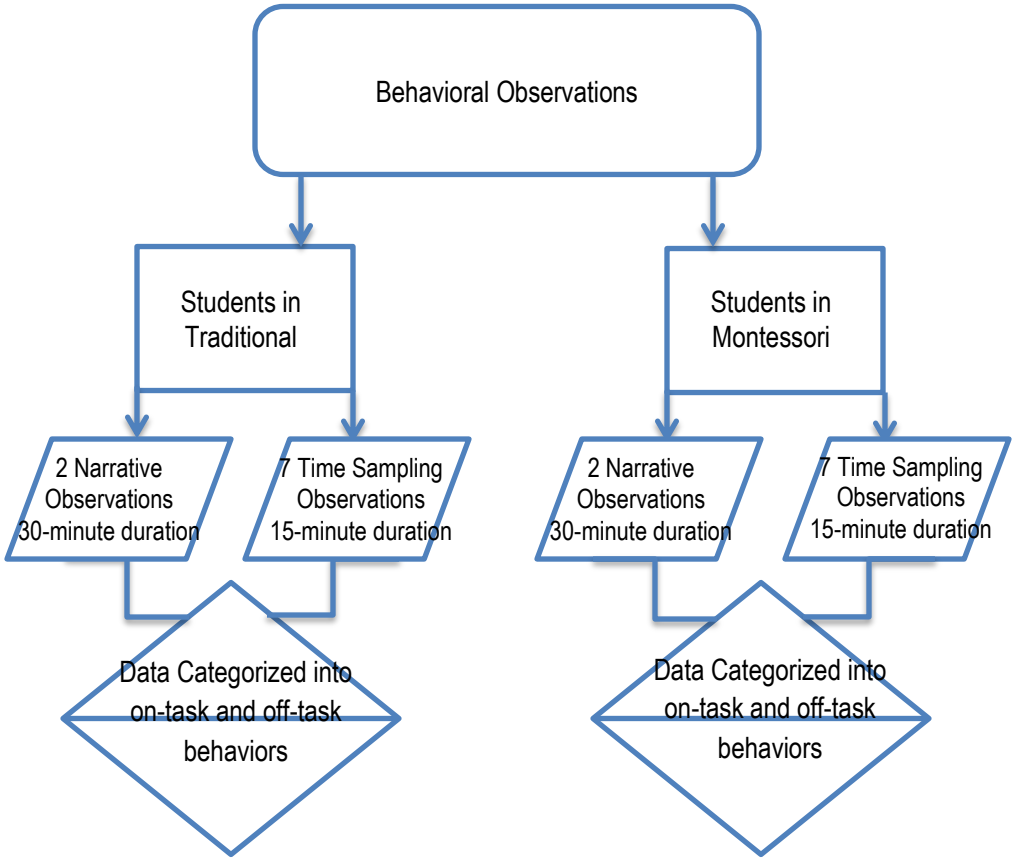

Figure 3.2 Flow-chart for Phase 2 of the research

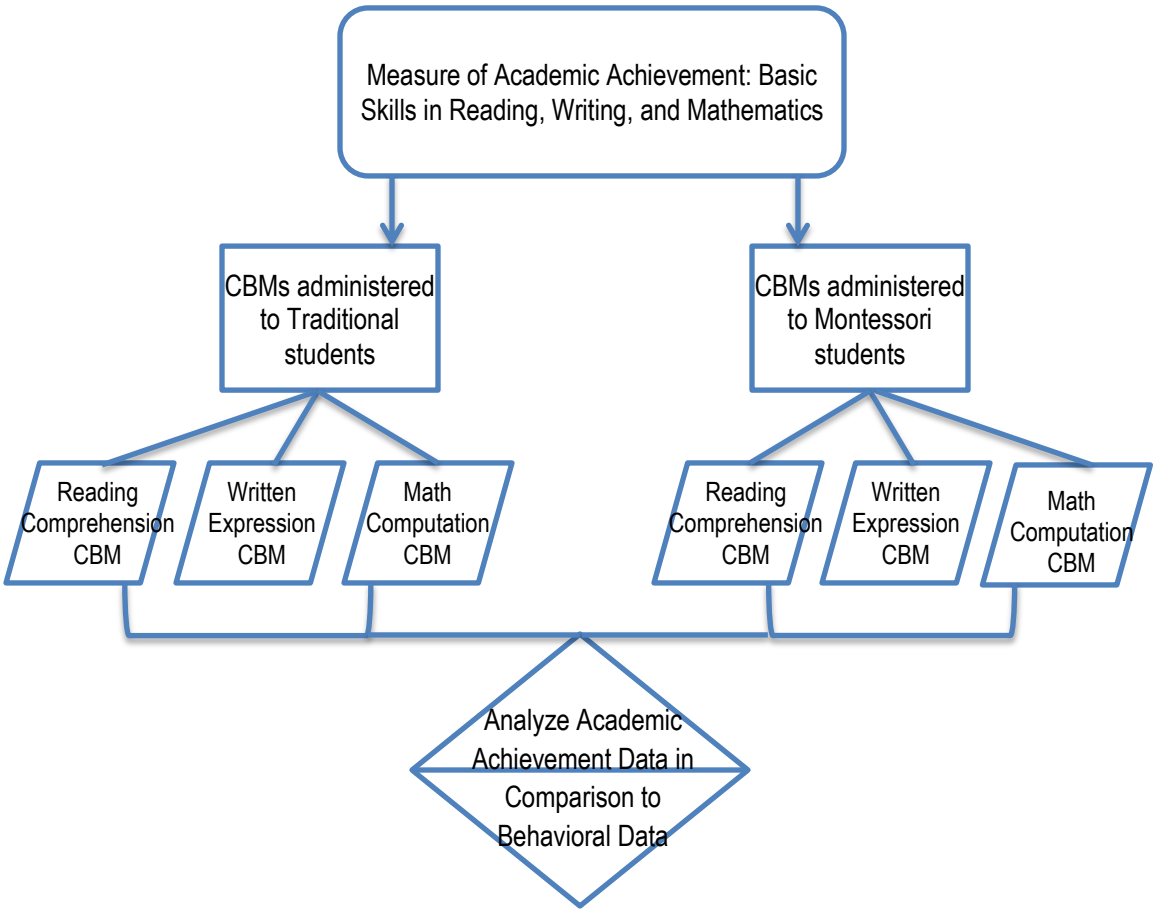

Figure 3.3 Flow-chart for Phase 3 of the research

CHAPTER 4: FINDINGS FROM THE DATA ANALYSIS

4.1 INTRODUCTION

This study examined the prevalence of on- and off-task behaviors of second- and third-grade students with a parent-reported diagnosis of ADHD in two different educational classroom settings in a rural school district in South Carolina that offers both Montessori and traditional classroom instructional options. Data was collected using both qualitative and quantitative measures.

Observational data was collected through two 30-minute narrative observations for each of the 10 students included in the study as well as through seven time-sample observations collected for each student using the BOSS software for behavioral observations in school settings. In addition, brief academic achievement measures called CBMs were administered to all of the students in the study in the areas of reading, writing, and mathematics.

Preliminary data gathered prior to the selection of the students included semi-formal teacher interviews and parent/guardian questionnaires. The data collected regarding behaviors and academic achievement were analyzed to determine the differences, if any, among observed on- and off-task behaviors as well as in academic achievement for reading, writing, and mathematics, for students attending school in a Montessori classroom environment as opposed to a traditional classroom environment.

This action research study was implemented to gather data that may be used by the educational leaders, parents, and teachers in Oakland School District in making important decisions for students in elementary school students diagnosed with ADHD who have the option to attend one setting or the other. Previously, local data regarding potential differences between the two settings for students who struggle with sustained attention, focus and/or with hyperactivity was not available for educators and parents/guardians in Oakland School District. Therefore, the researcher recognized a need in this area, as parents, teachers, and other educational stakeholders involved in student planning meetings often raised questions and concerns about which setting may or may not be the best instructional setting for individuals diagnosed with ADHD.

4.2 RESEARCH QUESTIONS

The data collected for this study was analyzed for the purpose of answering the following two research questions:

1) What are the behavioral differences displayed in elementary students diagnosed with ADHD in a traditional classroom structure as opposed to a Montessori classroom structure?
2) What are the differences in academic achievement in the traditional sample as opposed to the Montessori sample as measured by grade level Curriculum Based Measurements (CBMs)?

4.3 PURPOSE OF THE STUDY

This study was implemented to collect data and information regarding the behaviors of elementary students diagnosed with ADHD in two different classroom

settings: (1) traditional classrooms and; (2) Montessori classrooms. Quantitative and qualitative data collected from this study will be shared with teachers, parents, administrators, and other interested parties to provide more information about the potential impact each of these classroom environments may have in regard to the prevalence of on- and off-task behaviors for second and third grade students with ADHD. Limited research is available to assist parents and educators in decision-making in a district that offers a choice between the traditional and Montessori classroom setting for students in kindergarten through eighth grade.

4.4 FINDINGS OF THE STUDY

Both qualitative and quantitative data collection methods were used to gather information from a variety of methods and sources. Prior to the selection of the student sample, qualitative data was collected from semi-structured interviews with Montessori and traditional classroom teachers of second- and third-grade students as well as from questionnaires completed and returned by the parents or guardians of second- and third-grade students from the classes selected from three different elementary schools. After the selection of five students from each educational setting, additional qualitative data was collected from narrative observations recorded by the researcher for each student in the sample. Quantitative data collected for the study included seven time-sample observations per student using systematic time-sample software as well as scores obtained from three academic achievement measures given to every student in the sample.

Teacher Interview Data. Montessori and traditional teachers were selected for interviews from the three elementary schools being used as the research settings for the

action research study. The sample of teachers interviewed from all three schools included a total of five teachers from the lower elementary Montessori classes and five teachers from second- and third-grade traditional classes. Each teacher granted consent for the interview to be audio-recorded by signing a consent form prior to the interview. After students were selected, the interviews for the teachers whose classrooms were used for the study were transcribed. The transcriptions aided the researcher with identifying pertinent information with accuracy.

Following each interview, copies of the *Parent/Guardian Questionnaire: Student Information* document were given to the teacher to send home with every second- and/or third-grade student in the class. The parental consent forms for possible student selection and participation were enclosed with the questionnaire. Following careful review of the returned questionnaires, the researcher selected students who met the criteria needed to be included in the sample. In conclusion, the classrooms in which the selected students were enrolled included three of the five classes from the traditional classroom setting and four of the five classes from the Montessori setting.

The brief semi-structured interview consisted of eight questions and was used to gather information regarding the classroom environment and schedule as well as to gather background information for each teacher. The interview asked teachers to describe behavioral and academic expectations and the physical layout of the classroom inquired about the use of classroom rules and/or a systematic behavior management system. The information provided was used to determine whether each teacher used a classroom-wide behavior management system and whether classroom rules were posted in each classroom.

The fourth question in the interview asked the teacher what the student-to-teacher ratio is for the class. Interview results provided whether or not other adults, such as classroom assistants or paraprofessionals, were in the classroom daily during the time of this study. The Montessori classrooms are provided one classroom assistant. In addition, one of the Montessori classrooms included the presence of two additional adults who were each assigned to an individual student in that particular classroom. The student-to-teacher ratios listed in Table 4.1 indicate the number of students to adults in each of the classrooms used in the study. The background information, as well as additional information regarding the use of rules and behavior management systems, for each of the seven teachers whose classrooms were selected for the research setting is provided in Table 4.1.

Teacher interview information

Interviewee	Total Years of Experience	Years in a Montessori Classroom	Years in a Traditional Classroom	Classroom Rules (Y/N)	Behavior Management System (Y/N)	Student: Teacher Ratio
Montessori						
Teacher A (M)	6	6	0	Y	N	20:2
Teacher B (M)	4	4	0	Y	N	22:2
Teacher C (M)	20	16	4	Y	Y	29:4
Teacher D (M)	9	5	4	Y	Y	24:2
Traditional						
Teacher A (T)	4	0	4	Y	Y	20:1
Teacher B (T)	1	0	1	Y	Y	22:1
Teacher C (T)	21	0	21	Y	Y	21:1

Overall, five of the seven teachers had less than 10 years for total years of experience, with four of those having less than five years of experience. Two of the

teachers, one Montessori and one traditional, had 20 or more total years of experience. Two of the Montessori teachers interviewed also had some experience teaching in a traditional classroom setting. None of the three traditional classroom teachers had experience teaching in a Montessori classroom, with the exception of one teacher who provided additional clarification about her experience. Teacher B (T) provided that she had some experience in a Montessori setting, as she was a student teacher in a Montessori setting while pursuing her degree in education.

All seven teachers interviewed from the two educational settings indicated that they used classroom rules. Five of the seven teachers implemented classroom-wide behavior management systems or strategies. These five included all three teachers from the traditional classroom setting and three of the five teachers interviewed from the Montessori classroom setting. Overall, the Montessori classrooms had more adults present in each room than the traditional classrooms, which had one adult present in each room.

The last question of the teacher interview, asked teachers to describe what they believe are the main differences between the Montessori and the traditional classes and/or how the classroom structures are different. In response to this question, one of the Montessori teachers, Teacher D (M) (personal communication, April 21, 2017), described the following:

> One of the main differences is that Montessori classrooms consist of three grade levels of students. The Montessori classroom is a prepared environment that is set up to assist students in their learning path. I believe that Montessori classrooms have more hands on learning opportunities. Lessons are taught individually and in

small groups rather than whole group in traditional classrooms. In the Montessori classroom the lessons are adapted to fit the students' needs and taught in an order that best fits the child's learning path and work pace. Montessori children are active participants in their learning.

In the interview with Teacher C (M) (personal communication, March 3, 2017), she stated the following in response to her beliefs of the main differences between the Montessori and traditional classroom settings:

> Well we have three different grade levels and I like that because the children can teach each other things. Our groups are flexible…. And there is freedom in choosing the work that they want to do first during their work cycle. They may want to start with a language lesson and then go to math and there is a time to move, you know, there's movement and there's freedom in choosing where they want to work–the floor or maybe working with a buddy, you know.

Teacher A (T) provided that she believed that, "Montessori is more child-centered than traditional, in a sense that we [traditional teachers] are so set upon the mindset of, we're teaching to the standards, and we have our roadmap of things that we're supposed to accomplish and get done" (personal communication, February 8, 2017). In addition, in regard to the instruction, she stated that, "it's pretty much the same for every student, regardless of what their prior knowledge is coming in," whereas Montessori, in her opinion, is more "focused on growing the individual child based on their current level."

Another interviewee, Teacher B (T) (personal communication, February 8, 2017), described the following in her depiction of the overall differences between the two classroom settings:

I would say the biggest difference between Montessori and traditional would be– and now, this is for me being in both and what I've seen–that in traditional, a lot of the workload is on the teacher; whereas, in Montessori, a lot of the workload is on the children, because the lessons in Montessori are already prepared.

BOSS Observations. Seven time-sampling observations were completed for each student in the study using the BOSS behavioral observation software. Each of these observations took place during core academic instruction in the students' natural classroom environments. A variety of time periods (e.g., morning and afternoon) and academic settings were included across the seven time-sampling observations for each student. A list of the percentages of on-task and off-task behaviors observed for each student is presented in Table 4.2, shown below.

Table 4.2

Percentage of on- and off-task behaviors observed

Montessori	**Behavior**	**BOSS 1**	**BOSS 2**	**BOSS 3**	**BOSS 4**	**BOSS 5**	**BOSS 6**	**BOSS 7**	**Total**
Student A (M)	AET	10 (33)	21(71)	9(29)	26(88)	16(54)	21(71)	24(79)	127(425)
	PET	15(50)	3(8)	1(4)	3(8)	4(13)	1(4)	6(21)	33(144)
	OFT-M	5 (17)	1(4)	1(4)	0(0)	9(29)	3(8)	0(0)	19(62)
	OFT-V	0(0)	0(0)	4(13)	1(4)	0(0)	4(13)	0(0)	9(30)
	OFT-P	0(0)	5(17)	15 (50)	0(0)	1(4)	1(4)	0(0)	22(75)
Student B (M)	AET	18(58)	13(42)	6(21)	19(63)	25(83)	5(17)	15(50)	101(334)
	PET	1(4)	7(25)	23(75)	5(17)	4(13)	19(63)	15(50)	74(247)
	OFT-M	5(17)	10(33)	0(0)	1(4)	1(4)	5(17)	0(0)	22(75)
	OFT-V	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	OFT-P	6(21)	0(0)	1(4)	5(17)	0(0)	1(4)	0(0)	13(46)
Student C (M)	AET	9(29)	4(13)	10(33)	15(50)	25(83)	9(29)	25(83)	97(320)
	PET	13(42)	25(83)	16(54)	10(33)	4(13)	4(13)	5(17)	77(255)
	OFT-M	2(8)	1(4)	3(8)	0(0)	1(4)	17(58)	0(0)	24(82)
	OFT-V	4(13)	0(0)	0(0)	4(13)	0(0)	0(0)	0(0)	8(26)
	OFT-P	2(8)	0(0)	1(4)	1(4)	0(0)	0(0)	0(0)	4(16)
Student D (M)	AET	16(54)	14(46)	23(75)	29(96)	17(58)	14(46)	25(83)	138(458)
	PET	8(25)	5(17)	6(21)	1(4)	10(33)	11(38)	0(0)	41(138)
	OFT-M	2(8)	5(17)	1(4)	0(0)	3(8)	5(17)	0(0)	16(54)
	OFT-V	0(0)	1(4)	0(0)	0(0)	0(0)	0(0)	5(17)	6(21)
	OFT-P	4(13)	5(17)	0(0)	0(0)	0(0)	0(0)	0(0)	9(30)
Student E (M)	AET	13(42)	21(71)	25(83)	16(54)	21(71)	20(67)	4(13)	120(401)
	PET	14(46)	9(29)	5(17)	14(46)	3(9)	6(21)	16(54)	67(222)
	OFT-M	2(8)	0(0)	0(0)	0(0)	1(4)	3(8)	3(8)	9(28)
	OFT-V	0(0)	0(0)	0(0)	0(0)	3(9)	0(0)	7(25)	10(34)
	OFT-P	1(4)	0(0)	0(0)	0(0)	2(8)	1(4)	0(0)	4(16)
Traditional	**Behavior**	**BOSS**	**BOSS 2**	**BOSS**	**BOSS**	**BOSS**	**BOSS**	**BOSS**	

		1		3	4	5	6	7	
Student A (T)	AET	23(75)	14(46)	25(83)	24(79)	14(46)	17(58)	17(58)	134(445)
	PET	2(8)	13(42)	5(17)	6(21)	1(4)	13(42)	7(25)	47(159)
	OFT-M	1(4)	0(0)	0(0)	0(0)	2(8)	0(0)	3(8)	6(20)
	OFT-V	1(4)	0(0)	0(0)	0(0)	13(42)	0(0)	3(8)	17(54)
	OFT-P	3(8)	3(12)	0(0)	0(0)	0(0)	0(0)	0(0)	6(20)
Student B (T)	AET	19(63)	6(21)	13(42)	16(54)	26(88)	7(25)	11(38)	98(331)
	PET	5(17)	21(71)	6(21)	14(46)	4(13)	23(75)	16(54)	89(297)
	OFT-M	0(0)	0(0)	10(33)	0(0)	0(0)	0(0)	0(0)	10(33)
	OFT-V	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	OFT-P	6(21)	3(8)	1(4)	0(0)	0(0)	0(0)	3(8)	13(41)
Student C (T)	AET	13(42)	1(4)	14(46)	15(50)	17(58)	4(13)	17(58)	81(271)
	PET	4(13)	21(71)	13(42)	14(46)	4(13)	17(58)	8(25)	81(268)
	OFT-M	7(25)	4(13)	3(12)	1(4)	5(17)	5(17)	4(13)	29(101)
	OFT-V	5(17)	0(0)	0(0)	0(0)	3(8)	0(0)	0(0)	8(25)
	OFT-P	1(4)	4(13)	0(0)	0(0)	1(4)	4(13)	1(4)	11(38)
Student D (T)	AET	15(50)	27(88)	0(0)	0(0)	18(58)	1(4)	23(75)	84(275)
	PET	7(25)	0(0)	26(88)	26(88)	12(38)	28(92)	4(13)	103(344)
	OFT-M	1(4)	1(4)	3(8)	3(8)	0(0)	0(0)	0(0)	8(24)
	OFT-V	3(8)	1(4)	0(0)	0(0)	0(0)	0(0)	2(8)	6(20)
	OFT-P	4(13)	1(4)	1(4)	1(4)	0(0)	1(4)	1(4)	9(33)
Student E (T)	AET	9(29)	30(100)	6(21)	11(38)	0(0)	8(25)	15(50)	79(263)
	PET	13(42)	0(0)	24(79)	14(46)	19(63)	20(67)	5(17)	95(314)
	OFT-M	2(8)	0(0)	0(0)	0(0)	10(33)	0(0)	1(4)	13(45)
	OFT-V	4(13)	0(0)	0(0)	1(4)	0(0)	1(4)	0(0)	6(21)
	OFT-P	2(8)	0(0)	0(0)	4(13)	1(4)	1(4)	9(29)	17(58)

Note. AET = Active Engaged Time; PET = Passive Engaged Time; OFT-M = Off-Task Motor; OFT-V = Off-Task Verbal; OFT-P = Off-Task Passive
Raw score(percentage)
Total number of intervals recorded per observation = 30

As shown in Table 4.2, the percentages of the observed on-task behaviors, coded as AET and PET, are listed for each of the seven time sample observations for every student in the Montessori group as well as the traditional group. In addition, the percentages of the observed off-task behaviors, coded as OFT-M, OFT-V, and OFT-P, are listed for each student from the Montessori group and the traditional group for each of the seven BOSS time sample observations.

The data in the table indicates that, overall, the on-task codes, AET and PET, were the most prevalent behaviors in the BOSS observations for students in both the Montessori group and the traditional group. Likewise, the off-task behavioral code with the highest prevalence across settings for both groups was OFT-M while the off-task behavioral code with the lowest prevalence for both groups was OFT-V.

Figure 4.1, "Average percentages of on- and off-task behaviors," shown below, illustrates the average percentages of on- and off-task behaviors observed for the Montessori group as well as the averages for the Traditional group. Overall, AET behaviors were observed the most during the seven time-sample observations in the Montessori classroom setting, as the group average for being actively engaged was 55.4%. Behaviors coded as PET were the next most prevalent across the seven observations, as the group average for students in the Montessori classes was 27.6%.

Likewise, the most prevalent category of behaviors observed overall for the traditional group was AET, with an average of 45.4%. The second highest area of prevalence for observed behaviors was PET, as those behaviors were coded 39.4% of the time across all seven observations. As seen in Figure 4.1, the two groups shared similar patterns for the off-task behaviors as well. OFT-M was observed most in each setting while OFT-V behaviors were observed the least overall.

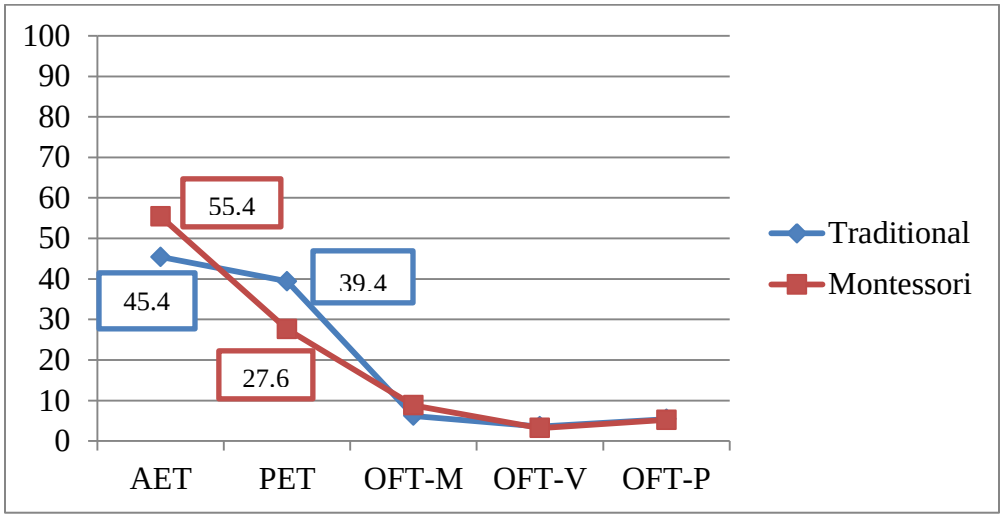

Figure 4.1 Average percentages of on-task and off-task behaviors

Montessori BOSS Observations. Figure 4.2, shown below, illustrates the average percentages of on- and off-task behaviors observed for each of the five students

in the Montessori group. Overall, both the males and females in the group presented a similar pattern of on- and off-task behaviors. AET behaviors were the most prevalent for each student in the group, which indicates that the students were observed being actively engaged (e.g., participating in discussions, doing a hands-on task, writing on the board, etc.) for the majority of the time observed across the seven time-sample observations. OFT-M was the most prevalent category observed for off-task behaviors for the students in this group, with the exception of Student E (M) for whom OFT-V was the highest. OFT-P behaviors were observed the least for two students in this group, Student C (M) and Student E (M) while OFT-V behaviors were observed the least for the other three students in the group.

Student A (M). Student A (M) was observed being on-task for a total average of 76% of the seven time-sample observations. This student was observed being actively engaged 61% of the time and passively engaged 15% of the time.

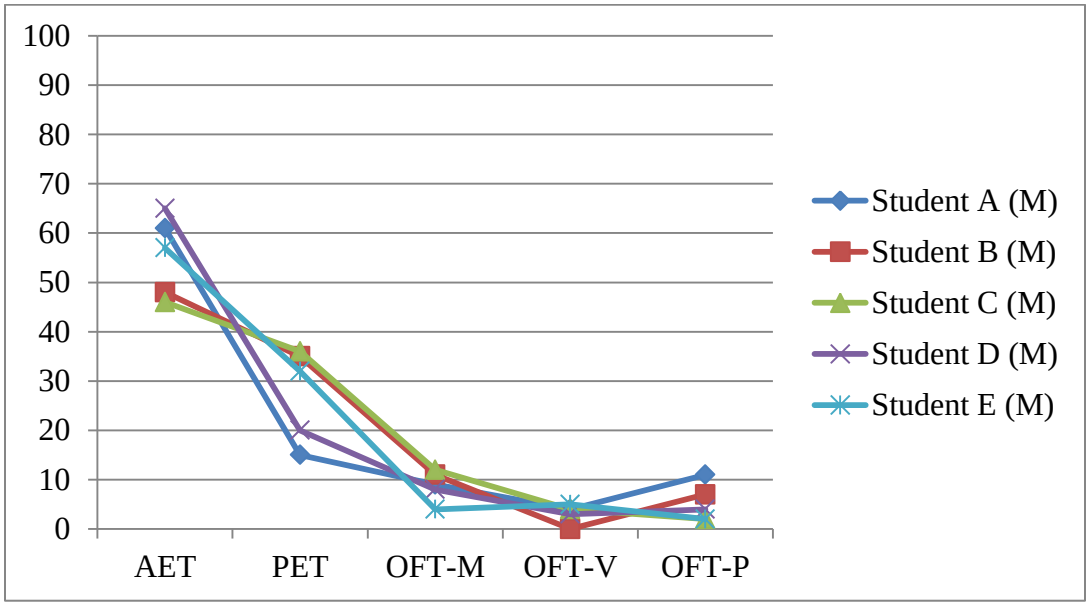

Figure 4.2 Percentage of on- and off-task behaviors–Montessori

The average percentage of time off-task observed across the seven BOSS observations for Student A (M) was 24%. Behaviors coded as OFT-P were observed an average of 11% of the time, which was her highest area of prevalence for off-task behaviors. Off-task behaviors involving motor movement (OFT-M) was observed an average of 9% of the time and behaviors coded as OFT-V was observed an average of 4% across the time-sample observation periods.

Student B (M). As shown in Figure 4.2, Student B (M) was observed being on-task for a total average of 83% of the seven time-sample observations. The student was observed being actively engaged 48% of the time and passively engaged 35% of the time. The average percentage of time off-task observed across the seven BOSS observations for Student B (M) was 17%. Behaviors coded as OFT-M were observed an average of 11% of the time, which was her highest area of prevalence for off-task behaviors. Off-task behaviors coded as being more subtle and passive (OFT-P) was observed 7% of the time. According to Student B's (M) time-sample data, she was not observed as being verbally off-task during the seven BOSS time-sample observations.

Student C (M). Student C (M) was observed being on-task for a total average of 82% of the seven time-sample observations. The student was observed being actively engaged 46% of the time and passively engaged 36% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student C (M) 18% of the overall time. Figure 4.2 demonstrates that off-task behaviors involving motor movement (OFT-M) were observed an average of 11% of the time, which was his highest area of prevalence for off-task behaviors. This data indicates that Student C (M) was observed exhibiting behaviors such as fidgeting with an object or getting out of his seat more than

he was observed being off-task verbally (e.g., talking out of turn) or passively (e.g., looking around the room or in a blank stare). Off-task behaviors coded as being more subtle and passive (OFT-P) was observed 2% of the time while OFT-V behaviors were observed 4% of the time.

Student D (M). Student D (M) was observed being on-task for a total average of 85% of the seven time-sample observations. This student was observed being actively engaged 65% of the time and passively engaged 20% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student D (M) 15% of the overall time. Off-task behaviors involving motor movement (OFT-M) were observed an average of 8% of the time, which was her highest area of prevalence for off-task behaviors. Off-task behaviors coded as being more subtle and passive (OFT-P) was observed 3% of the time while OFT-V behaviors were observed 4% of the time.

Student E (M). Student E (M) was observed being on-task for a total average of 89% of the seven time-sample observations as presented in Figure 4.2. This student was observed being actively engaged 57% of the time and passively engaged 32% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student E (M) 11% of the overall time. Off-task behaviors involving verbal behaviors (OFT-V) were observed an average of 5% of the time, which was his highest area of prevalence for off-task behaviors. This data indicates that Student E (M) was observed exhibiting behaviors such as, talking out of turn or talking to a peer for an average of 5% of the time across all seven time-sample observations. Off-task behaviors coded as being more subtle and passive (OFT-P) was observed 2% of the time while OFT-M behaviors were observed 4% of the time.

Traditional BOSS Observations. Figure 4.3, shown below, illustrates the average percentages of on- and off-task behaviors observed for each of the five students in the group who received instruction in the traditional classroom setting. The males and females in the traditional group presented a similar trend, overall, of on- and off-task behaviors, as shown in Figure 4.3. However, the individual percentages varied slightly in regard to which on-task and off-task behavior category had the highest percentages for each student in the traditional classroom setting. AET behaviors were the most prevalent for three of the five students in the traditional setting for the majority of the time observed across the seven time-sample observations. Behaviors coded as PET were the most prevalent on-task behaviors observed for two of the five students in this setting. Passively off-task behaviors (OFT-P) were the most prevalent for three of the five students in this group. OFT-M was the most prevalent category observed for off-task behaviors for one of the five students and OFT-V was the most prevalent off-task category observed for one of the five students. Overall, the group of students in the traditional classroom environment was on-task an average of 85% of the time sample observations and off-task an average of 15% of the time across all seven time sample observations.

Student A (T). Student A (T) was observed being on-task for a total average of 87% of the seven time-sample observations. The student was observed being actively engaged 64% of the time and passively engaged 23% of the time. The average percentage of time off-task observed across the seven BOSS observations for Student T (M) was 13%. Verbally off-task behaviors, coded as OFT-V, were this student's highest area of prevalence for off-task behaviors as it was observed 7% of time for the seven time

sample observations. Off-task behaviors involving motor movement (OFT-M) were observed an average of 3% of the time and behaviors coded as OFT-P were observed an average of 3% across the time-sample observation periods.

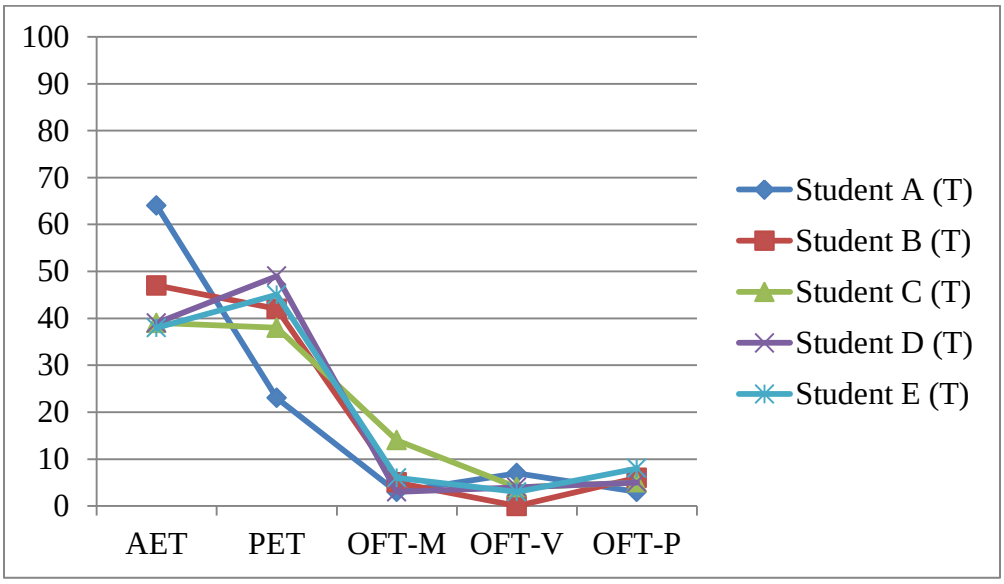

Figure 4.3 Percentage of on- and off-task behaviors–traditional

Student B (T). As shown in Figure 4.3, Student B (T) was observed being on-task for a total average of 89% of the seven time-sample observations. The student was observed being actively engaged 47% of the time and passively engaged 42% of the time. The average percentage of time off-task observed across the seven BOSS observations for Student B (T) was 11%. Behaviors coded as OFT-P were observed an average of 6% of the time, which was this student's highest area of prevalence for off-task behaviors. Off-task behaviors involving motor activity (OFT-M) were observed 5% of the time. According to Student B's (T) time-sample data, she was not observed as being verbally off-task during the seven BOSS time-sample observations.

Student C (T). Student C (T) was observed being on-task for a total average of 77% of the seven time-sample observations. The student was observed being actively

engaged 39% of the time and passively engaged 38% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student C (T) 23% of the overall time. Figure 4.3 demonstrates that off-task behaviors involving motor movement (OFT-M) were observed an average of 14% of the time, which was his highest area of prevalence for off-task behaviors. This data indicates that Student C (T) was observed exhibiting behaviors such as, fidgeting with an object or getting out of his seat more than he was observed being off-task verbally (e.g., talking out of turn) or passively (e.g., looking around the room or in a blank stare). Off-task behaviors coded as being more subtle and passive (OFT-P) were observed 5% of the time while OFT-V behaviors were observed 4% of the time.

Student D (T). Student D (T) was observed being on-task for a total average of 88% of the seven time-sample observations. The student was observed being actively engaged 39% of the time and passively engaged 49% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student D (T) 12% of the overall time. Off-task behaviors involving motor movement (OFT-P) were observed an average of 5% of the time, which was his highest area of prevalence for off-task behaviors. Off-task behaviors coded as OFT-V were observed 4% of the time while OFT-M behaviors were observed 3% of the time for Student D (T).

Student E (T). Student E (T) was observed being on-task for a total average of 82% of the seven time-sample observations as presented in Figure 4.3. The student was observed being actively engaged 37% of the time and passively engaged 45% of the time. Off-task behaviors were recorded across the seven BOSS observations for Student E (T) 18% of the overall time. No difference in prevalence was observed between Student E's

(T) off-task verbal and motor behaviors as OFT-V and OFT-M behaviors were observed an average of 3% of the time for each category across the seven time-sample observations.

Narrative Observations. Two 30-minute narrative observations were conducted for each student in the traditional classroom group as well as each student in the Montessori group. Key words and phrases describing specific behaviors and student interactions were highlighted as the qualitative narratives were reviewed and analyzed. In addition, key words and phrases that described the setting of the lesson/activity were highlighted in a different color. The highlighted words and phrases were then coded according to the behavioral and setting descriptions defined in the *BOSS User Guide* (2013) developed by Pearson. For example, a phrase stating that a student was "following along on the worksheet by marking his opinion with a pencil" was coded as AET, as the student appeared to be actively engaged in the task. In addition, descriptions that provided that a student was looking toward the board (source of instruction) or looking toward a teacher who was reading to the group were coded as PET, which indicated that the student appeared to be passively engaged in the lesson. The narrative observations provided qualitative descriptions of the students, their interactions with peers and teachers, the types of behaviors displayed in specific activities, and additional details about the classroom environments.

Traditional Group. Two narrative observations were completed for each of the five students in the group attending classes in the traditional classroom structure. The students were observed in their natural classroom environments for 30-minutes per observation. Observation narratives for these students revealed some commonalities as

well as differences among the traditional classroom settings. For example, each of the teachers of students in this group used an explicit behavior management system and had classroom rules posted in their classrooms.

Initially, each of the classrooms was arranged in a similar set-up with student desks grouped into groups of four or five. However, one classroom was rearranged after the first two observations, with student desks forming a large "U" shape with one cluster of four desks in the center of the U. All but one of the classrooms in the traditional environment played soft instrumental music in the background during most of the lessons observed.

Student A (T). Student A's (T) first narrative observation occurred in the morning. The content covered during this observation was English Language Arts (ELA), which involves reading and writing. During the first half of this observation, students were participating in a whole group lesson, which was coded as LgGp:TPsnt. Students were seated at their desks, which were arranged in groups of four to five, while the teacher was standing near the promethean board in the front of the room, talking about a passage displayed on the board. Student A (T) was seated in a group of four, near the font left portion of the room. Later in the observation, the class was instructed to select a book or books to take outside to read individually for 30 minutes. The setting for this activity was coded as ISW:TPsnt. Student A (T) followed directions and read quietly after transitioning from the classroom to the designated location outside.

The second narrative observation for Student A (T) included the following two settings during the 30-minute observation period: LgGp:TPsnt and SmGp:TPsnt. This observation began with a whole group, ELA lesson. The teacher was reviewing a

worksheet on the Promethean board while the students were participating in a "Question and Answer" discussion. Student A (T) looked around the room and toward the teacher periodically. However, she appeared to be passively off-task at times as she did not consistently look at the teacher or other students while they were talking. After transitioning to a small group lesson involving reading and writing, Student A (T) appeared to become more engaged as she wrote in her notebook and participated in the group discussion.

Student B (T). Student B's (T) first narrative observation took place in the afternoon during a guided reading small group lesson which also involved writing. She was seated on a stool at a kidney shaped table directly across from the teacher and in between two other peers. Student B (T) appeared to be actively and passively engaged in the lesson, as she wrote in her notebook and attended to each person who spoke in the group. Occasionally, when the teacher began speaking to another student in the group, Student B (T) would quietly talk to the second peer seated next to her. The setting for this activity was coded as SmGp:TPsnt.

The second 30-minute observation occurred in the morning during a whole group ELA lesson in which students were prompted to listen to the teacher read a passage presented on the Promethean board while marking certain details in their individual copies of the passage. Student B (T) appeared to be attending as she marked on her paper periodically and looked toward the teacher when she read the passage. At one point, the teacher asked students to give her a "double thumbs up" if they had underlined certain segments of the passage. Student B (T) signaled both thumbs held up in response. She

continued to direct her attention toward the teacher and the task at hand for the remainder of this observation.

Student C (T). The first narrative observation for Student C (T) occurred in the afternoon during two different activities. Initially, Student C (T) was seated with a partner at a table in the back of the room. He appeared passively engaged at first, as he had his head leaned against his arm while he looked at his partner who was speaking to him. Later, his teacher assisted him and his partner. He spoke quietly to his peer and began writing. During this segment of the observation, Student C (T) stood up and walked away from his seat next to his partner several different times. He walked to his desk twice and looked through some belongings and he walked to the sink once to get a sip of water, all of which were coded as OFT-M.

The second narrative observation for Student C (T) occurred in the morning during ELA instruction. The settings for this observation period included LgGp:TPsnt during a whole group lesson and ISW:TPsnt during independent reading time near the end of the observation. In the beginning of this observation, Student C (T) was seated on the floor, directly in front of the Promethean board on which the assignment was displayed. The teacher read segments of the passage aloud while students used markers or highlighters to mark statements believed to be opinions. OFT-M behaviors were recorded during this observation, as this student was observed fidgeting with the marker he held for the assignment. He periodically rolled the marker on the floor and tossed it up in the air a few times, catching it as it descended. He willingly participated in the class discussion when his teacher directly asked him a question. Notes in the narrative observation indicated that Student C (T) was passively engaged during the time in which

students were instructed to read a book quietly and independently. He appeared to be reading the text as he looked down at the book he held and turned pages periodically.

Student D (T). The first narrative observation for Student D (T) occurred in the afternoon during math instruction. In the beginning of the observation, Student D (T) was seated as his desk which was arranged in a group with three other desks. One male student was seated beside him and two female students were directly across from Student D (T) and the other male peer. Student D (T) was actively engaged initially, as he was writing on his paper and appeared to be solving math problems. Occasionally, he twisted around in his seat to look at a male peer in the group of desks behind him and spoke to that peer as well as another student who walked by his desk. After briefly speaking to the peer, he returned his attention to the task at hand. Later, Student D (T) took the completed document to his teacher. Near the end of the observation he transitioned to a seating position on the rug near the front of the classroom where two other males were also seated. Student D (T) held a book in his hands but looked around at others for a couple of minutes while he held the book open in his lap.

The second narrative observation for Student D (T) occurred during a morning ELA lesson that included a writing assignment in a ISW:TSmGp setting and a reading assignment for the latter part of the observation, which was coded as a LgGp:TPsnt setting. During the first setting, Student D (T) was working independently on a handwriting assignment while the teacher worked with a small group in the back left corner of the room. Student D (T) was writing in a handwriting workbook in the beginning of the observation. A digital timer was displayed on the Promethean board as a visual cue for the students to see how much time remained to complete the task. The

noise level was low, as soft music played in the background and the only two students talking quietly were the two seated at the small group table with the teacher. Behaviors coded as OFT-M were recorded twice during this segment of the observation, due to the student fidgeting with his mechanical pencil (i.e., removing the eraser, putting it back in, and twisting the opposite end of the pencil). During the large group lesson, Student D (T) appeared to be passively off-task as he looked around the room instead of looking at his copy of the passage the teacher was reading to follow along, as directed.

Student E (T). The first narrative observation for Student E (T) occurred during a whole group math lesson and review, which was coded as LgGp:TPsnt. Student E (T) was seated at a desk in a group of five near the back, center of the classroom. The teacher displayed five math problems being reviewed on the Promethean board, centered on the wall in the front of the classroom. During the lesson, several students were called upon to come to the board and write the steps to the problem and the answer for one of the five problems. Student E (T) was called to come to the board to work one problem, and he willingly complied and participated. Narrative observations notes indicated that he was observed being actively and passively engaged for the majority of this observation period. One OFT-V behavior and one OFT-P behavior was recorded during the observation period.

Student E (T) was during a large group ELA lesson, coded as LgGp:TPsnt, for the second narrative observation. First, he was observed participating in a class wide discussion about a topic presented on the promethean board. Student E (T) participated once when the teacher asked him a direct question and again later by voluntarily raising his hand to participate. Later, the students were instructed to move to a seated position

on the rug near the front of the classroom to listen to the teacher read a chapter from a children's novel. During this segment of the observation, behaviors recorded indicated a higher prevalence of off-task behaviors (verbal and passive) for Student E (T). While the teacher was reading aloud to the group, he was observed whispering to a peer two times and smiling while watching a couple of male peers who were fidgeting with an item one other time.

Montessori Group. Two narrative observations were completed for each of the five students in the group attending classes in the Montessori setting. The students were observed in their natural classroom environments for 30-minute per observation. Observation narratives for these students revealed some commonalities as well as differences among the Montessori classroom structures. For example, each of the teachers of students in Montessori classrooms used classroom rules and had rules or expectations posted in the classrooms. All but one of the Montessori classroom teachers indicated that behavior management techniques and/or a behavior management system were used for the class.

The Montessori classrooms were arranged with a similar physical layout. Each classroom had a large rug centered in front of the Promethean board (positioned in the "front" of the classroom). These rugs were used for students when directed to sit "on line" around the edge of the rug for whole group lessons. Numerous bookshelves and other storage areas (e.g., cabinets or drawers), were position around the room where materials and lessons were categorized and stored by subject area. In addition, three of the four classrooms had desks clustered in groups or in lines and one room had small tables and chairs for students, with fewer desks. All of the classrooms in the Montessori

environment played soft instrumental music in the background during most of the lessons observed.

Student A (M). The settings during Student A's (M) first narrative observation included LgGp:TPsnt for the first portion of the observation during a whole group lesson and SmGp:TPsnt for the remainder of the observation period while students were working in small groups of two or three per group. The lesson began with the teacher instructing the entire class about a writing assignment. Student A (M) was observed being actively engaged during this lesson as she raised her hand and participated on more than one occasion during the group discussion. Later, the teacher assigned students to a partner or to a group of three. Student A (M) was paired with a male peer. She followed directions to get materials and sat on the floor near the peer. The teacher circulated the room and assisted various groups during this time. Several off-task behaviors which included OFT-M and OFT-P were recorded during this time period, as Student A (M) occasionally picked at her fingernails, fidgeted with her pencil, or stared at other peers. She became more actively engaged after being encouraged by her teachers to write more as she began writing in her notebook and continued writing for the remainder of the observation.

During the second narrative observation for Student A (M), she was completing assigned morning work independently while the teacher was working with a small group. This setting was coded as ISW:TSmGp. Initially, Student A (M) was actively engaged as she was observed writing and retrieving materials from a shelf to use during her independent lesson. She read a pamphlet she retrieved but began alternately staring ahead or picking at her fingernails (OFT-P and OFT-M). She occasionally quietly stared

at peers around her as well. After she stood up to go speak with someone, she returned to her seat and appeared to be actively engaged as she began writing in her notebook. She worked quietly at her desk for the remainder of the observation.

Student B (M). Student B (M) was observed in an independent work setting, while the worked with a small group (ISW:TSmGp) during her first narrative observation period. She was seated on the rug, writing in a notebook. Several off-task behaviors which included OFT-M and OFT-P were recorded as Student B (M) periodically fidgeted with her pencil or lesson plan paper, looked around the room and at peers, and tapped her pencil gently against her face while looking around. At one point, the teacher assistant called her name for her to bring her work to be checked. Student B (M) complied as she showed the assistant her assignment then returned to a seating position and began working on the lesson. Later Student B (M) appeared to be actively engaged as she retrieved materials from a shelf, returned to her position on the rug, and began looking at cards and writing in her notebook again.

Student B (M) was observed in an independent and small group work setting during an ELA lesson during the second narrative observation. During this observation, Student B (M) followed direction to transition to the rug with the other students in her grade level and appeared to listen to the teacher's instruction provided to the small group. She was recorded as being actively engaged as she participated by answering questions the teacher asked. After the small group lesson, Student B (M) returned to her desk and began working on an assignment using colored pencils. Student B (M) appeared mostly on-task and actively engaged during this observation, with OFT-M behaviors only recorded for two different instances during the 30-minute period.

Student C (M). Student C (M) was observed during a whole group math lesson (LgGp:TPsnt) on the rug during the first narrative observation. He raised his hand and participated in the group discussion. Student C (M) demonstrated behaviors characterized as being actively engaged as he wrote in his notebook and drew figures (e.g. circles) with colored pencils per teacher instructions. In addition, he looked at the teacher while she spoke which was categorized as PET. An off-task behavior involving motor activity (OFT-M) was recorded once during this time period as he looked down and fidgeted with his pencil once during instruction.

During the second narrative observation, Student C (M) was observed completing morning work assignments independently while the teacher worked with a small group of students (ISW:TSmGp). He pulled orange cards from a box and arranged them into three rows on his desk. He appeared to read the cards, as he looked down at them with his forehead resting in his hands, which was categorized as being passively engaged (PET). Actively engaged behaviors were noted when he got up to retrieve materials and when he was observed writing in his notebook. Student C (M) was observed exhibiting a few off-task behaviors, both passive and motor-related, during this observation, as he fidgeted with his pencils and in his seat twice and started around the room once.

Student D (M). Student D (M) was observed working independently on a math lesson while the teacher circulated the room and worked with students periodically (ISW:TPsnt). She was seated on the rug near a female peer. Student D (M) periodically manipulated small objects she pull from a box and wrote in a notebook which was opened in her lap, demonstrating active engagement. Occasionally, she stared at others and looked around the room at others, which was coded as OFT-P. Later in the

observation, she stood up several different times and walked to the teacher to check her assignment. Near the end of the observation, she spoke to a peer as they exchanged pencils. She began writing again after this exchange.

The second narrative observation occurred during an activity setting coded as ISW:TSmGp, as Student D (M) was working independently while the teacher provided instruction to a small group. Initially, she was working on a math lesson dealing with time, as she stamped clock images in her notebook and wrote on each one. She got up two different times: once to take her lesson plan list to her teacher to be checked and once to retrieve materials from a shelf and cabinet for the lesson. Later, she began working on a lesson in which she appeared to be copying items from a stack of cards. She continued writing in her notebook for the remainder of the observation.

Student E (M). During the first narrative observation, Student E (M) was observed in independent and whole group work settings (ISW:TSmGp and LgGp:TPsnt). The observation began with students reading independently and quietly. Student E (M) was sitting in a desk that was in a corner of the room, not grouped with other desks. He appeared to be passively engaged as he was looking down at his book, turning pages periodically. Off-task behaviors involving motor activity were recorded during one portion of the observation when Student E (M) turned running water on and off at the sink when he went to the water fountain. In addition, he was observed playing with a paper towel he had crumbled in the shape of a ball which he threw in the trashcan similar to how a basketball is thrown into a hoop. Later, he transitioned to a seating position on the rug after the class was instructed to come to the rug for a lesson with the entire class. One off-task behavior was recorded as OFT-M as he crawled around others on the floor

at one point. He returned to being passively and actively engaged for the remainder of the lesson, as he appeared to be following along in a book that the teacher was reading a passage from.

The second narrative observation for Student E (M) included several settings as he was observed first reading independently as the teacher monitored students in the room (ISW:TPsnt), then during whole group instruction time on the rug (LgGp:TPsnt), followed by students working in small group at different centers (SmGp:TSmGp). Overall, Student E (M) was observed being actively and passively engaged for the majority of this observation period. Initially, he appeared to be reading independently for the first segment of this observation. During the whole group lesson on the rug, he appeared to listen as he looked toward the teacher and the promethean board on which the lesson was displayed. Following that lesson, Student E (M) transitioned to a table with two other peers and began actively working on a writing assignment for the remainder of the observation.

Academic Achievement. Curriculum Based Measurements (CBMs) were administered to every student in each of the classes that included students selected for the sample groups of the study. A research-based, nationally normed program used, called *Aimsweb* (version 2.0), provided standardized instructions, probes, and norms tables. Probes were provided by way of whole-group administration for each class which included students in the sample for the following areas: reading comprehension, written expression, and math computation. The Aimsweb CBMs selected for Grades 2 and 3 included CWS for written expression, Maze for reading comprehension, and M-COMP for math computation. Each CBM provided standardized directions and prompts. In

addition, each measure was timed. Maze and CWS CBMs allow a three minute time frame and M-COMP allows a total of eight minutes for the CBM.

Written Expression. A timed written expression CBM was administered to the second and third grade classes that included students in the sample for the study. CBM writing prompts were distributed to every student in the class and administered in one large group session per class in order to avoid identifying the target students for the study. Scores (total number of CWS) and percentile ranks for each student included in the sample for the study are listed in Tables 4.3 and 4.4. Table 4.3 includes the scores for each student in the traditional classroom sample, and Table 4.4 includes the scores for each student in the Montessori classroom sample.

In the area of written expression, two out of the five students from the traditional classroom sample scored within the "Met Target" range, which ranges from the 15th to the 45th percentile. Student D's (T) score of 24 CWS was at the 35th percentile for the spring benchmark period for third grade. This score indicates that Student D (T) did as well, or better than, 35% of the *Aimsweb* nationally normed sample of third grade students. Student E (T) wrote 20 CWS in three minutes which is at the 24th percentile for the spring benchmark for third grade. Three of the five students from the traditional group scored within the "Not Met" range (less than the 15th percentile). Students A (T) and B (T) both received a score of 15 CWS, which is at the 14th percentile for the third grade-level spring benchmark period. Student C's (T) score for CWS was at the 12th percentile. Overall, these scores indicate that 40% of the students in the traditional group met the third-grade-level spring expectations for Correct Writing Sequences according to the nationally normed Aimsweb sample of third-grade students. These results provide

that 40% of the students in the traditional third-grade sample scored within the "Met Range" while 60% scored within the "Not Met" range for the third-grade spring expectations for CWS.

Four out of the five students from the Montessori classroom sample scored within the "Met Target" range on the Written Expression CBM for the total number of CWS written in three minutes based on grade level norms for *Aimsweb*. Student E (M) wrote 27 CWS, which is at the 42nd percentile for the spring of third grade. Student A (M) wrote 13 CWS at the 25th percentile, Student B (M) wrote 12 CWS at the 22nd percentile, and Student C (M) wrote 11 CWS at the 19th percentile. One of the five students, Student D (M), received a score of 7 CWS and ranked at the 9th percentile for the spring of Grade 2. This score indicates that Student D (M) scored as well or better than 9% of second-grade-level peers in the nationally normed sample for *Aimsweb* and fell within the "Not Met" range according to the nationally normed sample. Results of the second- and third-grade-level CWS CBMs indicate that 80% of the students from the Montessori sample scored within the "Met Range" and 20% scored within the "Not Met" range.

Math Computation. A timed written Math Computation (M-COMP) CBM was administered to the second and third grade classes that included students in the sample for the study. M-COMP probes were distributed to every student in the class and administered in one large group session per class in order to avoid identifying the target students for the study. The M-COMP probe uses a weighted point system. Therefore, each item answered correctly was worth 1, 2, or 3 points, as designated on the *Aimsweb M-COMP Answer Key*. Scores (total number of points) and percentile ranks for each student included in the sample for the study are listed in Tables 4.3 and 4.4.

In the area of math computation, two of the five students from the traditional classroom sample scored within the "Exceeded Target" range, above the 45th percentile. Student B (T) scored a total of 58 points which is at the 56th percentile for the spring benchmark period for third grade. This score indicates that Student B (T) did as well, or better than, 56% of the *Aimsweb* nationally normed sample of third grade students. Student E (T) wrote 56 CWS in three minutes, which is at the 52nd percentile for the spring benchmark for third grade. Three of the five students from the traditional group scored within the "Not Met" range at less than the 15th percentile. Student A (T) received a score of 27 points which is at the 11th percentile for the third-grade-level spring benchmark period. Student C's (T) score of 20 points is at the 6th percentile. Student D (T) scored at the 7th percentile with a score of 22 total points. Overall, these scores indicate that 40% of the students in the traditional group exceeded the third-grade-level spring expectations while 60% of the group did not meet expectations for the third-grade-level spring expectations for math computation skills according to the nationally normed *Aimsweb* sample of third-grade students.

Three out of the five students from the Montessori classroom sample scored within the "Met Target" range on the M-COMP CBM. In addition, one of the five Montessori students scored within the "Exceeded Target" range and one scored within the "Not Met" range for total number of points earned for correctly solved problems in eight minutes. Student B (M) received a score of 38 points, ranked at the 45th percentile for the spring of second grade. Student D (M) scored 35 points at the 35th percentile and Student E (M) scored 48 points at the 36th percentile. One of the five students, Student C (M), scored within the "Exceeded Target" range, with a score of score 42 points at the

61st percentile for the spring of grade level 2. In contrast, Student A (M) received a score of 20 points, which is ranked at the 9th percentile. This score indicates that Student A (M) scored as well or better than 9% of second grade level peers in the nationally normed sample for *Aimsweb* as this score fell within the "Not Met" range for M-COMP skills. Overall, these scores indicate that 60% of the students in the Montessori sample scored within the "Met Range," 20% scored within the "Not Met" range, and 20% scored within the "Exceeded Target" range for end of the year expectations for second- and third-grade-level M-COMP CBMs.

Maze. A timed reading comprehension CBM named "Maze" was administered to the second- and third-grade classes that included students in the sample for the study. Maze probes were distributed to every student in the class and administered in one large group session per class in order to avoid identifying the target students for the study. The students were read standardized instructions and completed a brief practice test prior to being instructed to read silently and complete the Maze passage by circling correct responses within a three-minute time frame. According to descriptions from *Aimsweb*, "Maze is a multiple-choice cloze task that students complete while reading silently" ("Cloze tasks from aimsweb," 2014, para 3). Students are required to read the grade level passage silently and to circle the correct word from a selection of three words shown in parenthesis within the text. In Maze passages, "every 7th word is replaced with three words inside parenthesis" ("Cloze tasks from aimsweb," 2014, para 3). Only one of the three words is the correct option that will restore the word from the original passage. The total number of words correctly circled within three minutes is calculated for the score.

Scores (the total number answered correctly) and percentile ranks for each student included in the sample for the study are listed in Tables 4.3 and 4.4.

As shown in Table 4.4, two out of the five students from the traditional classroom sample scored within the "Met Target" range, between the 15th and 45th percentiles on the third grade level Maze CBMs. Student C (T) correctly restored 10 words in three minutes which is at the 20th percentile for the spring benchmark for third grade. Student E's (T) score of 13 words identified correctly also fell within the "Met Target" range at the 35th percentile. Three of the five students' scores fell within the "Not Met" range for the spring of third grade level expectations. Student A's (T) score of eight words restored correctly is at the 11th percentile within the "Not Met" range. In addition, Student B (T) received a score of eight words restored correctly, which is at the 11th percentile for the spring benchmark period for third grade. Student D (T) received a score of six answered correctly, which is at the 5th percentile for the third-grade-level spring benchmark period for the Maze CBM. Overall, these scores indicate that 40% of the students in the traditional group exceeded the third grade level spring expectations while 60% of the group did not meet expectations for the third-grade-level spring expectations for Maze according to the nationally normed *Aimsweb* sample of third-grade students.

Table 4.3

CBM Scores and Percentiles – Traditional

		CWS	M-COMP	MAZE
Student A (T)	Score	15	27	8
	Percentile	14th*	11th*	11th*
Student B (T)	Score	15	58	8
	Percentile	14th*	56th***	11th*
Student C (T)	Score	14	20	10
	Percentile	12th*	6th*	20th**
Student D (T)	Score	24	22	6
	Percentile	35th**	7th*	5th*
Student E (T)	Score	20	56	13
	Percentile	24th**	52nd***	35th**

Note. WE = Written Expression; M-COMP = Math Computation; MAZE = Reading Comprehension

Cut Scores (Percentiles)	*Aimsweb* Guidelines for Cut Scores
45th> ***	Exceeded Target ***
15th-45th **	Met Target **
<15th *	Not Met *

Table 4.4

CBM scores and percentiles–Montessori

		WE (CWS)	M-COMP	MAZE
Student A (M)	Score	13	20	17
	Percentile	25th**	9th*	65th***
Student B (M)	Score	12	38	8
	Percentile	22nd**	45th**	16th**
Student C (M)	Score	11	42	6
	Percentile	19th**	61st***	9th*
Student D (M)	Score	7	35	5
	Percentile	9th*	35th**	7th *
Student E (M)	Score	27	48	15
	Percentile	42nd**	36th**	45th**

Note. WE = Written Expression; M-COMP = Math Computation; MAZE = Reading Comprehension

Cut Scores (Percentiles)	*Aimsweb* Guidelines for Cut Scores
45th> ***	Exceeded Target ***
15th-45th **	Met Target **
<15th *	Not Met *

These results are fairly consistent with the percentages reported for the traditional sample group for the Written Expression and M-COMP CBMs as 40% of the students from this sample met expectations for CWS on the writing CBMs and 40% exceeded expectations on the M-COMP CBMs. On all three measures 60% of the percentile for the traditional sample group fell within the "Not Met" range for reading comprehension, math computation, and written expression.

As shown in Table 4.3, two out of the five students from the Montessori classroom sample scored within the "Met Target" range on the Maze CBM. In addition, one of the five Montessori students scored within the "Exceeded Target" range and two scored within the "Not Met" range for total number answered correctly within three

minutes. Student B (M) received a score of eight words restored correctly and ranked at the 16th percentile for the spring of second grade. Student E (M) scored 15correct responses at the 45th percentile. Student C's (M) score of six correct responses is at the 9th percentile, indicating that this student did not meet the spring grade-level expectations for grade level 2. In addition, Student D (M) scored in the "Not Met" range at the 7th percentile with a score of 5 words restored correctly. One of the five students, Student A (M) scored within the "Exceeded Target" range, with a score of score 17 correct responses at the 65th percentile for the spring of grade level 2 for Maze. This score indicates that Student A (M) scored as well or better than 65% of second grade level peers in the nationally normed sample for *Aimsweb*. Overall, these results indicate that 40% of the students in the Montessori sample scored within the "Met Range," 40% scored within the "Not Met" range, and 20% scored within the "Exceeded Target" range for end-of-the-year expectations for second- and third-grade-level M-COMP CBMs.

The results for the Montessori sample group are fairly inconsistent among the three achievement areas of written expression, reading comprehension, and math computation. The percentages of the students whose scores indicate that the group met grade level expectations ranged from 40% (Maze) to 80% (CWS). Twenty percent of the Montessori group scored within the "Not Met" range on the M-COMP and CWS CBMs while 40% of the group scored within the "Not Met" range for Maze. In addition, 20% of the students in the Montessori sample scored within the "Exceeded Target" range for M-COMP and Maze and no students in this sample received percentile scores that exceeded expectations for CWS.

The overall, percentages of achievement scores for the Maze reading comprehension CBM, CWS on the written expression CBM, and math computation on the M-COMP CBM for the students included in the samples from both traditional and Montessori classrooms are presented in Figures 4.4, 4.5, and 4.6.

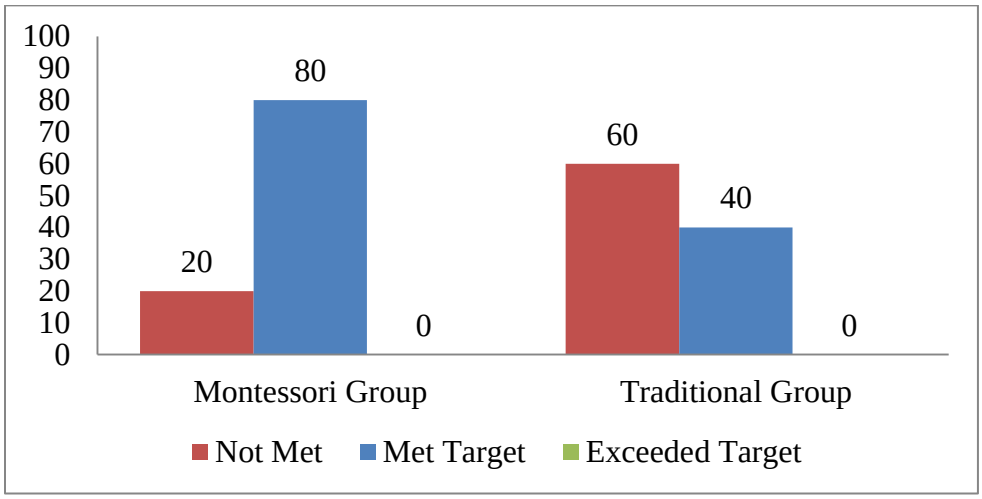

Figure 4.4 Results for CWS

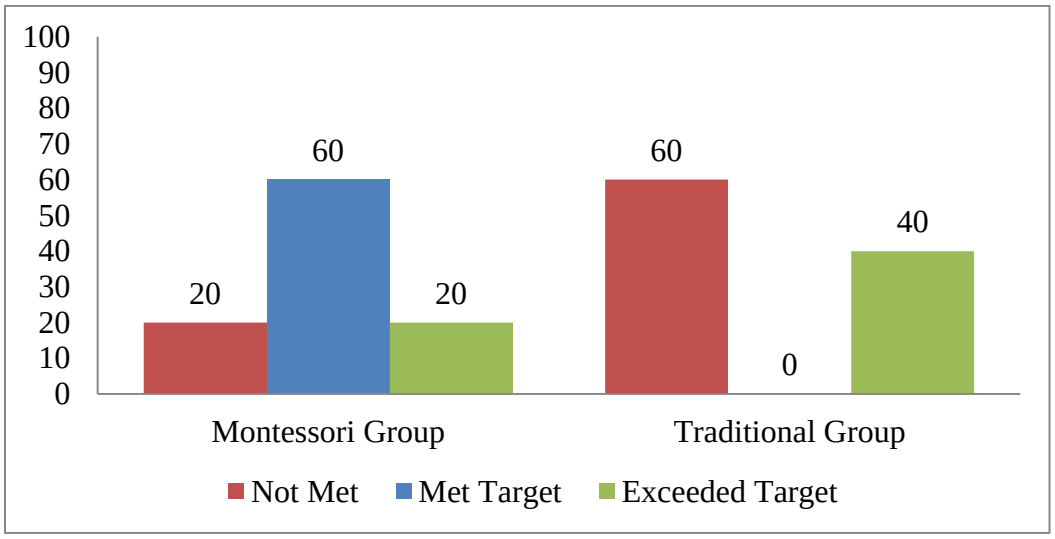

Figure 4.5 Results for M-COMP

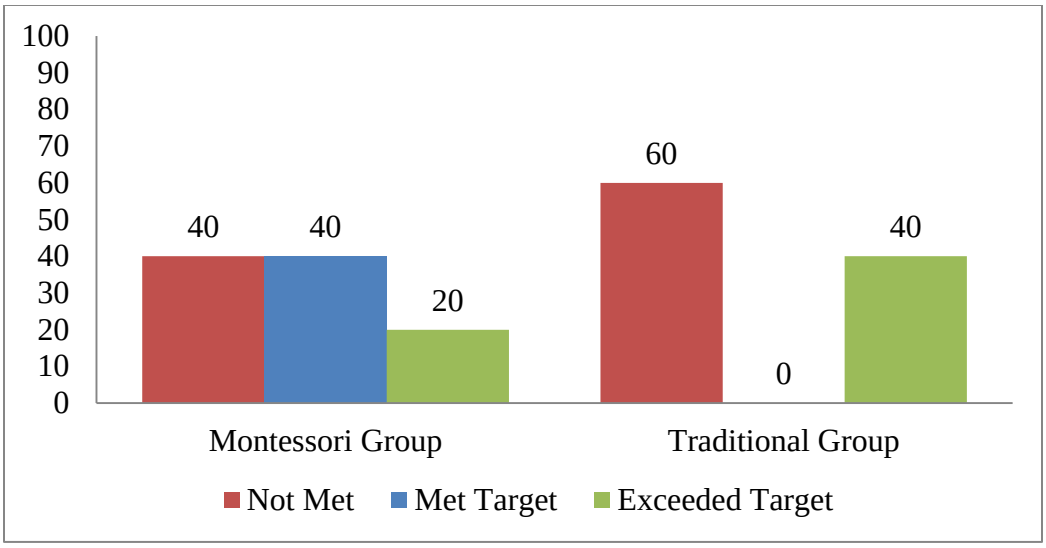

Figure 4.6 Results for Maze

4.5 INTERPRETATION OF RESULTS OF THE STUDY

Behavioral Observations. According to the results of the narrative and BOSS time-sample observations, students from the traditional and Montessori classrooms demonstrated fairly consistent patterns of prevalence of on- and off-task behaviors, as evident in Table 4.2 and Figures 4.1, 4.2, and 4.3. In addition, results described in the narrative observations for each student indicated similar patterns of the prevalence of on- and off-task behaviors in both the Montessori and traditional classroom settings as well. Collectively, the observation data indicated that each group, overall, demonstrated more on-task behaviors than off-task behaviors in each observation.

The two groups of students, overall, demonstrate a similar pattern in terms of the prevalence of the on- and off-task behaviors coded according to Pearson's (2013) *BOSS User Guide*. On-task behaviors, including both AET and PET, were observed at least 50% of the time in each of the time sample observations, with the exception of one, out of all 70 BOSS time-sample observations. This indicates that the students in both Montessori and traditional classes overall had a higher prevalence of on-task behaviors

than off-task behaviors. The data indicates that the Montessori group presented a high prevalence of the actively engaged on-task behaviors, which were coded as AET. The data reported for the student observations in the traditional classroom setting, on the other hand, demonstrated a higher prevalence of the passively engaged on-task behaviors, which were coded as PET. These results appear to be consistent with the descriptions the teachers provided regarding the Montessori Method implementing more hands-on activities and student-centered lessons than the more traditional method of instruction, which implements more teacher-directed and whole group lessons.

In regard to the prevalence of off-task behaviors in the Montessori setting versus the traditional classroom setting, off-task behaviors involving motor movement (OFT-M) were slightly more prevalent than OFT-M behaviors exhibited in the traditional classroom setting. In addition, off-task behaviors involving verbalizations (OFT-V) were slightly more prevalent in the traditional classroom setting, as indicated in Figures 4.1 and 4.3, than the Montessori setting. No difference was observed in the prevalence of passively off-task behaviors, coded as OFT-P, in the Montessori versus the traditional classroom settings. Similar to the results of the on-task behavioral patterns, these results are consistent with the narrative observations and teacher reports of environmental and instructional differences, as the Montessori setting is described as allowing students more freedom and movement while the traditional setting is more structured, offering fewer opportunities for movement in the classroom aside from doing activities like small-group rotations.

The academic achievement data collected in the areas of reading comprehension, written expression, and math computation indicated higher achievement levels in the

Montessori group. Overall, the majority of the students in the Montessori group sample met or exceeded grade level expectations in all three academic areas. The data reported for the math computation CBM (M-COMP) indicated that 60% of the students in the Montessori group met the grade level expectations for this set of skills, 20% exceeded the grade level expectations, and 20% did not meet the expectations. In addition, 80% of the students in this group met or exceeded grade level expectations for the reading comprehension CBM (Maze). The data collected for the CBM measuring basic writing skills (CWS), 80% of the students in the Montessori group met grade level expectations.

In contrast, 60% of the students in the traditional group sample did not meet grade-level expectations in all three academic areas based on the CBM data collected. In the area of math computation, 40% of the students in the traditional classroom sample exceeded the grade level expectations for the skills assessed on the M-COMP CBM. Similarly, 40% of the students also exceeded the grade-level expectations, as demonstrated by the data reported for the reading comprehension CBM (Maze), while 60% did not meet the grade level expectations. In the area of written expression, 40% of the students in the traditional classroom sample met expectations for basic writing skills.

4.6 CONCLUSION

In conclusion, the results of this study indicated that minimal behavioral differences were prevalent in the Montessori classroom structure as opposed to the traditional classroom structure. All in all, students in each of the classroom structures demonstrated a higher prevalence of on-task behaviors than off-task behaviors across the time sample and narrative observations. The differences revealed by the observational data included that behaviors coded as active engagement (AET) were of the highest

prevalence for students in the Montessori classroom structure whereas behaviors coded as passive engagement (PET) were of the highest prevalence for students in the traditional classroom structure. Off-task behaviors coded as involving motor activity (OFT-M) were most prevalent in terms of off-task behaviors for the students in the Montessori classroom environment. The most prevalent category of off-task behaviors evident in the behavioral observations of the students in the traditional classroom environment included OFT-V (e.g., unpermitted verbalizations).

In addition, the data collected to examine the potential differences in academic achievement in the traditional classroom structure as opposed to the Montessori classroom structure revealed some variation among the scores in the areas of reading comprehension, math computation, and written expression. The researcher considered factors that may have affected the academic achievement levels. These factors included that three of the five students in the Montessori group had been retained once and were reported as receiving additional academic support (e.g. special education services) at the time of the study as opposed to only one student having been retained in the traditional group. None of the students in the traditional group were reported as receiving additional academic support at the time of the study.

Although the achievement data collected through CBMs indicated that more students in the Montessori classroom structure met or exceeded grade-level expectations in all three academic areas than students in the traditional classroom structure, it is important to note that the mixed methods were used to examine information of potential academic achievement differences. Given the small sample size of the study, data gathered from the quantitative measures were not planned to be generalizable. The

behavioral and academic achievement data that was collected to answer the research questions regarding potential differences in on- and off-task behaviors in two contrasting classroom structures as well as the examination of potential differences in levels of academic achievement are presented in Table 4.5 below.

Table 4.5

Behavior codes and achievement levels across participants

Student	Prevalence of On- and Off-Task Behavior Codes		Academic Achievement Met/Exceeded Target			Receiving Additional Academic Services	Classroom Rules Posted in Setting	Classroom Behavior Management System
	Most Prevalent On-Task	Most Prevalent Off-Task	Writing (Y/N)	Math (Y/N)	Reading (Y/N)	Y/N	Y/N	Y/N
Montessori Group								
Student A (M)	AET	OFT-P	Y	N	Y	Y	Y	N
Student B (M)	AET	OFT-M	Y	Y	Y	Y	Y	N
Student C (M)	AET	OFT-M	Y	Y	N	Y	Y	N
Student D (M)	AET	OFT-M	N	Y	N	N	Y	Y
Student E (M)	AET	OFT-V	Y	Y	Y	N	Y	Y
Traditional Group								
Student A (T)	AET	OFT-V	N	N	N	N	Y	Y
Student B (T)	AET	OFT-P	N	Y	N	N	Y	Y
Student C (T)	AET	OFT-M	N	N	Y	N	Y	Y
Student D (T)	PET	OFT-P	Y	N	N	N	Y	Y
Student E (T)	PET	OFT-P	Y	Y	Y	N	Y	Y

Note: AET = Active Engaged Time; PET = Passive Engaged Time; OFT-M = Off-Task Motor; OFT-V = Off-Task Verbal; OFT-P = Off-Task Passive. Met/Exceeded Target = 15th-45th> percentile; Y/N = Yes/No

CHAPTER 5: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

This action research study, which was implemented over the course of one semester, was executed to gather additional information regarding the prevalence of on- and off-task behaviors exhibited by elementary students diagnosed with ADHD in a Montessori classroom structure versus a traditional classroom structure. The research setting included three elementary schools in a rural public school district in South Carolina that provides the option for students to attend a Montessori or a traditional classroom setting in Grades K–8. Data was collected using a mixed-methods approach to examine the potential differences of on- and off-task behaviors as well as academic achievement between the two groups.

Following obtaining approval to work in the research setting, a total of 10 students, five from each classroom structure, were selected based on preliminary information reported by parents and/or guardians on a questionnaire for individual student information. Semi-structured interviews provided additional data regarding the classroom structures, schedules, and behavioral techniques implemented in each room. On-task and off-task behaviors were examined using the BOSS software through two 30-minute narrative observations and seven, 15-minute time sample observations per student in the Montessori classroom setting as well as the traditional classroom setting. Academic achievement data was collected from brief measures, CBMs and was used to

examine potential differences in academic achievement for students in each of the two classroom environments.

5.2 RESEARCH QUESTIONS

This study included the collection and analysis of qualitative and quantitative data gathered to answer the following research questions:

1) What are the behavioral differences displayed in elementary students diagnosed with ADHD in a traditional classroom structure as opposed to a Montessori classroom structure?
2) What are the differences in academic achievement in the traditional sample as opposed to the Montessori sample as measured by grade level Curriculum Based Measurements (CBMs)?

5.3 PURPOSE OF THE STUDY

This study was implemented to explore the potential differences in the prevalence of on- and off-task behaviors of elementary students diagnosed with ADHD in a traditional classroom structure as opposed to a Montessori classroom structure. In addition, potential differences in academic achievement in the traditional setting as opposed to the Montessori setting were examined in this study. The data gathered and overall results of the study will be provided to key stakeholders in the school district to aid parents, teachers, and administrators in making educational decisions regarding which classroom structure may best meet the needs of students diagnosed with ADHD.

5.4 OVERVIEW OF THE STUDY

The data revealed minimal behavioral differences in the prevalence pattern of on- and off-task behaviors of elementary students diagnosed with ADHD in a traditional

classroom structure as opposed to a Montessori classroom structure. Overall, all of the students in both the traditional and Montessori classroom structures demonstrated a higher prevalence of on-task behaviors, which included active time engaged and passive time engaged, than off-task behaviors based on the data collected from the BOSS time sample and narrative observations.

The behavioral data further indicated that students in the Montessori classroom structure exhibited more AET on-task behaviors as opposed to the students in the traditional classroom structure, who exhibited a higher prevalence of PET on-task behaviors. While both groups also followed a similar pattern of prevalence in each of the three off-task behavioral categories, the data revealed the OFT-M behaviors were the most prevalent off-task behaviors observed in the Montessori classroom environment. Off-task behaviors coded as OFT-P were also the most prevalent off-task behaviors observed in the traditional classroom environment when comparing the individual rates of off-task behaviors observed. Minimal group differences were observed in terms of the prevalence of OFT-P and OFT-V behaviors.

Differences in academic achievement were revealed in the traditional classroom structure as opposed to the Montessori classroom structure in the data collected from CBMs which measured basic grade level skills for reading comprehension, math computation, and written expression. Overall, the data indicated higher rates of achievement in all three academic areas in the Montessori classroom as the majority of the students in the Montessori sample met or exceeded expectations. In contrast, the majority of the students in the traditional classroom sample did not meet expectations in all three areas of academic achievement.

Action Plan. The research findings of this study will be shared with teachers, administrators, parents, and other educational leaders in the district in which the study was implemented. The results of the study are planned to be used as a reference for professional learning opportunities, such as professional development sessions, and in meetings for individual students to help those examining the behavioral and academic differences among students with ADHD in the two educational settings offered in the school district. In a district offering the option of attending a Montessori classroom setting or a traditional classroom setting for elementary and middle school students, the decision regarding which setting may be more appropriate for students who struggle with behaviors such as inattention and hyperactivity is, at times, challenging. Limited research data has been available for guidance in this decision making process. While the size of the sample included in this study is small and did not include more than two elementary grade levels, the plan is for this research to be used as a resource for parents, students, and educators in this particular school district and to not be generalized to other settings.

Working collaboratively with educators and parents will encourage dialogue offering new insight, as well as provide a valuable source of input. While the study sample is small, the results of the minimal differences documented in student behaviors in the two settings may be shared with parents who are worried about the potentially negative outcomes of choosing one setting over the other. The results of this study may provide parents making such educational decisions a "peace of mind," when it comes to considering which classroom structure is more appropriate for students with symptoms of ADHD.

In addition, this research will be shared with the community to foster communication and increase awareness of ADHD and the two educational environments offered in this school district. Compared to Caucasian children, Latino and African-American children are less likely to be diagnosed with ADHD, according to recent findings reported by Consumer Health Digest (2013–2017). Moreover, Consumer Health Digest reports that scientists studying this research concluded that parents of these ethnic/minority groups are less likely to seek diagnosis or treatment for their children concerning the possibility of ADHD. Communication and awareness are key to providing all children with the best educational options available for each individual student. Although further research is still needed to expand the knowledge regarding on- and off-task behaviors in these two educational settings, Montessori and traditional, this study provides valuable information to serve students, educators, parents, and the community.

5.5 SUGGESTIONS FOR FUTURE RESEARCH

This research study included a small sample of second- and third-grade students from three traditional classes and four Montessori classes in a rural public school district in South Carolina which offers the option for students in Grades K–8 to attend either of those two settings. One suggestion for future studies examining the potential differences of on- and off-task behaviors of students with ADHD in a Montessori classroom structure as opposed to a traditional classroom structure is to expand the sample to more classrooms and grade levels from each setting. Future studies are suggested to examine more students in the grade levels being studied given that Montessori includes more than one grade level per class. Furthermore, more measures of academic achievement

including more students and additional grade levels from each classroom environment may be included in future studies to examine the potential differences in academic achievement in the traditional classroom structure versus the Montessori classroom structure.

In regard to demographic information and suggestions for future research, including a larger sample and expanding the number of classes and/or grade levels may enable researchers to include a wider variety of ethnicities in the sample. In addition, expanding the grade levels and including a larger sample size will yield useful data regarding gender differences related to this study. Future studies may examine potential gender differences among the different categories of on- and off-task behaviors as well as potential differences in the prevalence patterns of those behaviors.

5.6 CONCLUSION

In conclusion, the students in both the Montessori and traditional classroom settings demonstrated similar patterns of on- and off-task behaviors but different patterns in academic achievement. Overall, students in both the traditional classroom structure and the Montessori classroom structure exhibited more on-task behaviors across subjects and activities, as revealed in the qualitative and quantitative observational data. According to the data, students in the Montessori classroom structure exhibited more actively engaged on-task behaviors while students in the traditional classroom structure demonstrated a higher prevalence of passively engaged on-task behaviors. In addition, of the three off-task behavioral categories, which included motor, verbal, and passive behaviors, behaviors involving motor activity were the most prevalent off-task behaviors observed in the Montessori classroom setting. Behaviors involving audible verbal

responses that were not permitted at that point in the instruction and/or task, were the most prevalent off-task behaviors observed in the traditional classroom setting.

The data further revealed that the students in the Montessori classroom setting demonstrated more success with meeting grade-level expectations according to the data gathered from the academic achievement measures implemented in the areas of reading, writing, and mathematics. Academic achievement data provided that the students in the traditional classroom setting demonstrated less success with meeting the grade level standards across the three academic areas, as the majority of the scores from this sample fell below grade-level expectations for the measures implemented.

Therefore, while the prevalence of on- and off-task behaviors of elementary students diagnosed with ADHD were fairly consistent across the Montessori and traditional classroom settings, regardless of the task or method of instruction, differences were observed in academic achievement. The results of this study indicate potential differences in academic achievement among elementary students diagnosed with ADHD which need to be confirmed in future studies in the Montessori classroom structure as opposed to the traditional classroom structure in the areas of reading comprehension, math computation, and written expression.

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APPENDIX A – INITIAL PARENT/GUARDIAN LETTER AND QUESTIONNAIRE

Debriefing Letter to be Enclosed with Preliminary Questionnaire

Date

Dear Parent/Guardian,

I am a school psychologist in (name of district) and am currently a doctoral student in the Department of Education at the University of South Carolina. As a part of my research for my dissertation, I am looking into the two classroom environments offered in our elementary schools which include traditional and Montessori classes. As a professional who often consults with parents and teachers for various reasons, I have noticed that parents often question which environment is more suitable for their child and his/her educational needs. I hope that the information gathered in this study will help parents, guardians, teachers, and other educational professionals make well-informed decisions that are in the best interest of each individual student.

I am writing to ask if you would be willing to complete a brief questionnaire (enclosed). This questionnaire will help me determine which second and/or third grade students meet the criteria to be included in the small sample of which I will be observing. If your child does meet the criteria to potentially be included, you will receive a second letter and consent form to grant permission for your child to potentially be included in the selected sample. Students included in the sample will not need to know that they have been selected. I will be gathering behavioral data by completing observations in the child's natural classroom setting. I will not be directly interacting with any of the students and do will not interfere with the teacher's instruction in any way. The study will be no longer than one semester.

If you receive the follow-up letter and consent form, please be assured that all identifying information for schools, students, and teachers in this research will be treated confidentially and all information will be kept anonymously, meaning that no persons other than the researcher will be aware of which students are in the sample.

Many thanks in advance for completing the enclosed questionnaire and returning it to the classroom teacher for me. Please let me know if you need more information. Please do not hesitate to contact me at Email and (XXX) XXX-XXXX if you have any questions about this project

Parent/Guardian Questionnaire: Student Information

Student Information for an Educational Research Study

This questionnaire is designed for parents of second and/or third grade students enrolled in a Traditional or Montessori class. The purpose of this questionnaire is to help the researcher select students to be included in the study. If your child meets the requirements to be selected for the study, please note that student identification information will be strictly confidential. The researcher will not be directly interacting with students selected. The researcher will be collecting research data by way of unobtrusive behavioral observations. The researcher is conducting this research in partial fulfillment of the requirements for the degree of Doctor of Education.

Questionnaire Instructions:

Please respond to each of the following questions. Clearly select one option from the items listed for each question by **circling** your response (see the example listed below). Please return the completed questionnaire to your child's teacher by (insert date).

Example:

Your child is in the third grade.
(Yes) **No**

Child's Name: **Age:** **Grade:** **Male/Female**

---

1. Is your child diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)?

Yes **No**

If **no**, please discontinue this questionnaire.
If **yes**, please proceed and answer the remaining questions.

2. Was your child diagnosed by one or more of the following professionals (circle all that apply:

Pediatrician **Family Physician**

Clinical Psychologist **School Psychologist**

Please Specify if Other:_____

3. If known, please circle the subtype of ADHD diagnosed by the professional:

ADHD – Combined Type	ADHD – Inattentive Type	ADHD – Hyperactive/Impulsive Type	Not Sure

4. What age was your child when diagnosed? _____

5. Does he/she currently take medication prescribed to treat symptoms of ADHD?

Yes **No**

6. Has your child ever been retained (repeated a grade) since beginning Five-Year Kindergarten?

Yes **No**

7. Is your student in a Montessori or a Traditional classroom?

Montessori **Traditional**

8. If attending a Montessori class, has your child been in a Montessori class since beginning school in Kindergarten?

Yes **No** **Not Applicable**

9. If attending a Traditional class, has your child been in a Traditional class since beginning school in Kindergarten?

Yes **No** **Not Applicable**

10. Does your child present any behavioral issues at school?

Yes **No**

11. Does your child receive any additional educational services such as special education or remedial services (e.g. participation in an academic program for extra help at school)?

Yes **No**

Optional Item: If you selected "Yes" for question 11, please specify which program(s) your child participates in: _____

APPENDIX B – FOLLOW-UP LETTER AND CONSENT

Informational Letter and Consent Form for Parents or Guardians

Date

Dear **Parent(s) or Guardian(s)**:

Based on information provided in a recent questionnaire you completed, I am writing to ask your permission for your child to potentially be included in the sample of second and third graders selected for a research study of *On-Task and Off-Task Behaviors in Traditional versus Montessori Classrooms*. This study will be conducted at (insert name of child's school) over a period of 8-10 weeks. The results of this study may be helpful for educators and families in (insert name of school district) who have questions regarding which academic setting may be better suited for students who are diagnosed with ADHD. Only children who have parental/guardian permission will be included in the sample selected. Also, parents/guardians may withdraw their permission at any time during the study without penalty by indicating this decision to the researcher.

Students who are included in the sample do not need to be made aware that they have been selected. This study will not interfere with the learning of students in the classroom. This researcher will simply be completing unobtrusive observations in their natural classroom setting. The teachers will also not be made aware of which students are included in the study sample. The only time the researcher will directly interact with second and/or third grade students in the classroom is during the administration of a brief academic achievement measure to all of the second and/or third grade students in the room. All identifying information will be kept strictly confidential. Behavioral data gathered from observations and the academic achievement data collected from the brief assessment will be used for research purposes only.

I would like to assure you that this study has been reviewed and approved by the Institutional Review Board at the University of South Carolina. In addition, it has the support of the district superintendent and principal at your child's school. However, the final decision about the participation is yours. Should you have any concerns or comments resulting from your child's participation in this study, please contact the researcher whose contact information is listed below.

It will be greatly appreciated if you would permit your child to potentially participate in this project, as I believe it will contribute to furthering our knowledge of on-task and off-task behaviors in the Traditional classroom setting versus the Montessori classroom setting for children diagnosed with ADHD. Please complete the attached permission form, whether or not you give permission for your child to participate, and return it to the school by (Insert Date).

If you have any questions about the study, or if you would like additional information to assist you in reaching a decision, please feel free to contact me, Sara-Frances Lail, at Email or (XXX) XXX-XXXX. Thank you in advance for your interest and support of this study.

Consent Form – Child
(Accompanies the information letter about the study)

I have read the information letter concerning the research study entitled *Students Diagnosed with Attention Deficit Hyperactivity Disorder: A Study of On-Task and Off-Task Behaviors in Traditional Versus Montessori Classrooms* conducted by Sara-Frances C. Lail of the Department of Education at the University of South Carolina.

I acknowledge that all information gathered on this project will be used for research purposes only and will be confidential. I am aware that permission may be withdrawn at any time without penalty by advising the researcher.

I realize that this project has been reviewed by and approved by the Institutional Review Board at the University of South Carolina.

If I have any questions about the study I can feel free to call the researcher, Sara-Frances Lail, at Email and (XXX) XXX-XXXX.

☐ Yes – I give permission for my child to be included in the sample for the study.

☐ No – I do not give permission for my child to be included in the sample for the study.

Child's Name **(please print)**
_____

Parent or Guardian Signature _____ Date _____

APPENDIX C – TEACHER LETTER AND CONSENT FORM

Information Letter for Classroom Teachers
Consent Form for Invitation to be Interviewed

Date

Dear **(Insert Teacher's Name):**

I am writing to request your agreement to participate in a study I am conducting as part of my Doctoral degree in the Department of Education at the University of South Carolina. I would like to provide you with more information about this project and what your involvement would entail should you agree to take part. I assure you that this study has been reviewed and approved by the Institutional Review Board at the University of South Carolina. In addition, it has the support of the district superintendent and principal at your school.

This study will be conducted in a minimum of two second and/or third grade classrooms (traditional and Montessori) at (**insert name of child's school**) over a period of 8-10 weeks. The purpose of this research is to study the differences, if any, of on-task and off-task behaviors in the traditional classroom setting versus the Montessori classroom setting among a small sample of second and third grade students with parent-reported diagnosed Attention Deficit Hyperactivity Disorder (ADHD). The goal of this research is to share the results of this study with parents, teachers, and other educators in this district to serve as a tool in helping make a more informed decision as to which program might be the better choice for each individual child's educational needs.

Participation in this study is voluntary. It will involve a brief interview to take place in a mutually agreed upon location and time. You may decline to answer any of the interview questions if you so wish. With your permission, the interview will be tape-recorded to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish. The audio recording will be deleted once the dissertation is completed. All information you provide will be kept strictly confidential. Your name will not appear in the dissertation or report resulting from this study, however, with your permission anonymous quotations may be used. There are no known or anticipated risks to you as a

participant in this study. You may withdraw your consent to participate at any point by notifying me, the researcher, without penalty.

A preliminary parent questionnaire will be sent home to each second and/or third grader in your class. The questionnaires completed and returned will be reviewed by the researcher in order to determine the students who meet the criteria for the study. A follow-up letter and consent form will be sent home to the students who meet the criteria. The teacher will not be made aware of the students selected in order to protect confidentiality. The primary source of data collection will be unobtrusive behavioral observations in the natural classroom setting. This researcher will not directly interact with students or the teacher. Please be assured that I will only be observing the behaviors of students whose parents have granted permission to be included in the sample. The second source of data collection will be through the group administration of Curriculum Based Measurements in the core academic areas of reading comprehension, written expression, and mathematics. This brief achievement measures be administered to all of the second and/or third graders in the classroom in order to maintain the anonymity of the students in the study sample. The achievement data as well as the behavioral observation data gathered for the students in the sample will be solely used for research purposes.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at (XXX) XXX-XXX or by e-mail at Email.

I very much look forward to speaking with you and thank you in advance for your assistance in this study.

CONSENT FORM

I have read the information presented in the information letter about a study being conducted by **Sara-Frances C. Lail** of the Department of **Education** at the University of South Carolina. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that I have the option of allowing my interview to be tape recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the dissertation and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This study had been reviewed and approved by the Institutional Review Board at the University of South Carolina.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

☐ YES ☐ NO

I agree to have my interview tape recorded.

☐ YES ☐ NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

☐ YES ☐ NO

Participant's Name (please print) _____

Participant's Signature ____ _____ Date _____

APPENDIX D – TEACHER INTERVIEW

Semi-Structured Teacher Interview

Preliminary Statement

Your participation in this study is greatly appreciated. Please be assured that all identifying information including your name, students' names, school name, etc. will be kept strictly confidential. All personal, identifiable information will be protected in any data collected and reported for this study. Observational data, achievement data, as well as transcripts or other information gathered will be used exclusively for research purposes.

You are not required to respond to all of the questions in this interview and you may discontinue this interview at any time. Do you have any questions?

In order report details accurately, I would like to record this interview. Do I have your permission to do so?

Teacher (assign a pseudonym):	**Montessori/Traditional**
Years of experience:	**Degree(s):**
Years of experience in a traditional classroom:	**Years of experience in a Montessori classroom:**
Years of experience teaching second grade:	
Years of experience teaching third grade:	

1. What are your overall expectations for your class:
    a. Behavioral expectations
    b. Academic expectations
2. What are the classroom rules for your students?

3. Do you use a classroom behavior management system or classroom management techniques? If so, please describe.

4. What is the student: teacher ratio in your room?

    a. Do you have a classroom assistant or any other student aides in the room?

5. Please describe your daily schedule:
    a. Schedule for core content lessons (Reading, Writing, and Math)

6. Describe your experience working with students with disabilities.

7. Please describe the physical structure and layout of your classroom.

8. What do you believe are the main differences between Montessori and Traditional classes?
    a. How are the classroom structures different?

APPENDIX E – BEHAVIORAL OBSERVATION FORMS

Behavioral Observation of Students in Schools
Time Sample Observation

Link to application: http://www.pearsonclinical.com/education/products/100000780/behavioral-observation-of-students-in-schools-boss.html#tab-details

Narrative Observation Form

Student Alias:	**Date:**
Time:	**Activity:**
Observer Position in the room:	**Subject/Lesson:**
Teacher Position in the room:	**Observation Number:**

Observation Notes: