THE IMPACT OF PEER MENTORS IN PHYSICAL EDUCATION ON STUDENTS WITH SEVERE COGNITIVE DISABILITIES

Jessica A. Lukas

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THE IMPACT OF PEER MENTORS IN PHYSICAL EDUCATION ON STUDENTS WITH SEVERE COGNITIVE DISABILITIES

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

to the faculty of the Department of

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at

ST. JOHN'S UNIVERSITY

New York

by

Jessica A. Lukas

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Jessica A. Lukas Anthony Annunziato, Ed.D
ABSTRACT

THE IMPACT OF PEER MENTORS IN PHYSICAL EDUCATION ON STUDENTS WITH SEVERE COGNITIVE DISABILITIES

Jessica A. Lukas

This research used a convenience sampling of five classes of special education students receiving adaptive physical education. Nineteen of the special education students were paired with peer mentors during adaptive physical education, nineteen special education students remained in a segregated adaptive physical education class. Through the analysis of statistical data there was a higher mean for the students in the peer mentor adaptive physical education. Although both groups made growth, there was a statistical significance on the post test for the students in the peer mentor adaptive physical education. Additionally, qualitative interviews and observational data yielded data indicating students’ social skills improved when working with peer mentors.
DEDICATION

This dissertation is dedicated to my family. Andrew for supporting all of my many years of schooling and always supporting me to pursue my dreams and following my aspirations. My children, James and Matthew, for having the patience to follow me on my educational journey. May you both always be lifelong learners and follow your dreams and aspirations.
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CHAPTER 1

Introduction

The Individuals with Disabilities Education Improvement Act (IDEIA) (2004) formerly the Education of the Handicapped Act (1975) mandated that all students with disabilities be educated in the least restrictive environment. The least restrictive environment may range from a general education classroom to a residential-based academic environment depending on the individual needs of each student. Aside from a general education classroom, an inclusion classroom is the least restrictive way to educate students with disabilities alongside their non-disabled peers (Public Law 101-476, 1990). Special education students that were once in segregated classrooms and facilities are now being returned to their neighborhood schools and put into age-appropriate regular education classrooms with their non-disabled peers (Ingram, 1997).

After the amendments made to the Education of the Handicapped Act in 1990 (PL-101-476, 1990) the academic environment of an inclusive atmosphere became and remained a controversial issue for several years. Data from the U.S. Department of Education (as cited in Shogren et al., 2015) indicates students with severe cognitive disabilities remain disproportionality segregated in special classes away from their general educational peers even after laws continue to be amended (Shogren et al., 2015).

Students with Intellectual Disabilities have been increasingly more supported under the above-mentioned laws, making schools accountable for these students’ education. Students classified as intellectually disabled, meaning “significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period that adversely affects
a student’s educational performance” are educated alongside their non-disabled peers challenging the least restrictive environment under IDEIA (Part 200.1).

Students with cognitive and physical disabilities are often educated in adaptive physical education classes. Grouping students with disabilities in isolated settings prevents them from participating in physical education alongside their typically developing peers. Many students with severe disabilities are “starting to be included in general physical education (GPE), though the theory regarding the most effective methods of achieving successful, meaningful, and mutually respectful inclusion is still relatively undeveloped in relation to the impact of contacts between students with SMD (students with severe and multiple disabilities) and their peers in inclusive GPE settings (Klavina & Block, 2008, p. 134).

**Problem Statement**

It is not yet known to what extent students with severe disabilities have greater physical and social performance in inclusive settings (adaptive physical education alongside a typically developing peer mentor) or segregated physical education settings. More and more students with disabilities are placed in the least restrictive environments. For some of these students, one of the least restrictive educational environment options is inclusion with the general education population. Elementary level teachers have a variety of issues and attitudes about inclusion. The research of the studies presented in chapter two points to the notion that there is a correlation between peer mentoring and the success of an inclusive environment. The issues that these studies address consist of ongoing professional development for all stakeholders working with students, training for peer mentors, and increased social and physical abilities. In addition, other issues that
may have an effect on inclusive environments these studies address are leadership behaviors and practices among administrators, correlation between the administrators’ and teachers’ philosophies, and ongoing professional development.

**Purpose of the Study**

The purpose of this study was to evaluate students’ physical and social progress in both inclusive and segregated physical education environments. The researcher investigated the physical and social performance of students with severe disabilities in both inclusive physical education and segregated adaptive physical education based upon standardized testing and teachers’ perceptions. This study took place at a public elementary school in Suffolk County, NY. The school consists of both general and special education students. Within the special education population, sixty-four students are intellectually disabled and receive adaptive physical education as per their individualized educational program. For the purpose of this study, the standardized testing of thirty-eight students were evaluated quantitatively. Additionally, eight educators were interviewed and four observational sessions were conducted.

**Research Questions**

The overarching question and inquiry on which this study was based aimed to determine whether inclusive adaptive physical education or segregated adaptive physical education environments had the greatest positive impact on student achievement. The following specific research questions guided this study:

**Research question one.** To what extent do peer mentors impact gross motor skills performance of students with severe cognitive disabilities (intelligence quotient
below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class.

The following hypotheses have been set.

H₀: There is no difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors.

H₁: There is a difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors.

Variables. This study assessed the effects of peer tutors during adaptive physical education classes. The independent variable for the study was the adaptive physical education environment. This variable is qualitative with two levels, (a) segregated adaptive physical education (b) adaptive physical education with peer mentors. The second independent variable is the time of the test. The Test of Gross Motor Development (TGMD-2) was administered in September and then again in June as a post-test. The TGMD-2 served as the dependent variable in this study.
Independent and dependent variables.

Table 1
Independent and Dependent Variables

<table>
<thead>
<tr>
<th>Name of IV</th>
<th>Qualitative / Quantitative</th>
<th>Number of Levels</th>
<th>Names of Levels</th>
<th>Active / Attribute</th>
<th>Between / Within</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive PE Environment</td>
<td>Qualitative</td>
<td>2</td>
<td>1- Segregated Adaptive PE</td>
<td>Active</td>
<td>Between</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2- Adaptive PE with peer mentors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Test</td>
<td>Qualitative</td>
<td>2</td>
<td>1- September</td>
<td>Active</td>
<td>Within</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2- June</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2
Dependent Variables for Ho / H₁:

<table>
<thead>
<tr>
<th>Name of DV</th>
<th>Operational Definition (How is it measured?)</th>
<th>Qualitative / Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of Gross Motor Development (TGMD-2) Pre Test</td>
<td>Standardized Testing</td>
<td>Quantitative</td>
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<tr>
<td>Test of Gross Motor Development (TGMD-2) Post Test</td>
<td>Standardized Testing</td>
<td>Quantitative</td>
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</table>

Research question two. To what extent do peer mentors impact social skills of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class, based on the perceptions of the educators involved in the physical education program.
Overview of Design and Methods

This researcher’s objective for this research was to collect comprehensive evidence on segregated and inclusive physical education models at the elementary level. Further, it was to identify quantitative and qualitative views and student growth, physically and socially, in both settings. It is not yet known if students with severe disabilities have greater physical and/or social performance in inclusive or segregated physical education settings. The researcher investigated this exploratory case study to determine the growth of physical and social performance of students with severe disabilities in both inclusive physical education and segregated adaptive physical education using mixed methods research, combining quantitative and qualitative methods in order to provide a broader perspective. All adaptive physical education students completed the Test of Gross Motor Development-2. Further, the researcher conducted qualitative interviews and non-participant observations of the adaptive physical education classes. The semi-structured interviews were conducted with physical education staff, a special education teacher, the principal, occupational therapist, psychologist, and athletic director.

Significance of the Study

Laws regarding inclusion and many other education policies are not completely adopted until they are successfully implemented in schools. In order for an inclusion environment to be a success, educators must not rely on the laws but on themselves. According to Klavina et al. (2008), special and general educators are challenged with the
unique and specific needs of students in inclusive environments. A successful physical education inclusive model demands supplementary assistance. Therefore, to ensure the success of an inclusive program there are several components that must be considered, such as peer mentoring, professional development, and leadership perspectives.

Committee on Special Education (CSE) teams must make recommendations to meet the needs of students in the least restrictive environment. The Committee on Special Education must evaluate the academic, physical, social, and management needs of each individual student. This researcher believes that the outcome of this study may provide information to stakeholders regarding appropriate program recommendations to support social and physical growth for students with severe disabilities. Further, the research can support students in segregated or inclusive sports programs based on the outcome of this study.

**Role of the Researcher**

For this mixed-method case study, I, the researcher, was the primary means of data collection, interpretation, and analysis. My role as the researcher was unmistakably known by all the informants. I did not interact as a participant in the delivery or activities of the adaptive physical education classes. I currently serve as the Assistant Superintendent for Special Education and Pupil Services within the school district. Prior to my current role, I was the building principal in the building in which the research was conducted. In addition, I previously served as a Special Education Director within the school district.
Research Assumptions

As a former special education classroom teacher, the researcher has prior knowledge of inclusive practices for students with severe cognitive disabilities. As the principal of a building with the special education students completely segregated for the entire school day, this researcher was concerned for the students’ social growth. Further, having knowledge of student success in inclusive environments, this researcher believes it beneficial for students to learn alongside their typically developing peers.

Definitions of Key Terms

Throughout this dissertation, the following key terms will be used frequently: peer mentors, segregated adaptive physical education, adaptive physical education with peer mentors, severe cognitive impairments.

For the purpose of this research study, the term peer mentor refers to a general education student, who is typically developing. This student has been paired with a similar-age cognitive impaired student for physical education class.

Adaptive physical education is a specially designed program of developmental activities, games, sports, and rhythms suited to the interests, capabilities, and limitations of students with disabilities who may not safely or successfully engage in unrestricted participation in the activities of the regular physical education program. The term adaptive physical education appears in Part 300 of the Code of Federal Regulations and Part 200 and Part 135 of the Commissioner’s Regulations (Part 200 - Students with Disabilities, 2016). A segregated adaptive physical education class is one in which all of the students are identified as having special education needs. Within this class, there are no typically developing general education peers. An adaptive physical education class
with peer mentors is a class in which students with special needs are paired with a general education peer mentor throughout the class period.

A student with a severe cognitive impairment is a student with significantly subaverage general intellectual functioning, (Intellectual Quotient below 70) present concurrently with insufficiencies in adaptive behavior (Part 200 - Students with Disabilities, 2016).

According to the Commissioner’s Regulations, Part 200, the term social development is defined as “the degree and quality of the student's relationships with peers and adults, feelings about self, and social adjustment to school and community environments” (Part 200 - Students with Disabilities, 2016, p. 13).

The term physical development is defined as “the degree or quality of the student's motor and sensory development, health, vitality, and physical skills or limitations which pertain to the learning process” (Part 200 - Students with Disabilities, 2016, p. 13). For the purpose of this study, the term physical abilities is related to gross motor skills of students.

**Organization of the Dissertation**

The following dissertation will contain four additional chapters. The next chapter, chapter two, is an outline of the academic literature and previously conducted research material as it relates to this topic. The third chapter presents the methodology used for this case study, identifying the data collection and analysis methods. The fourth chapter reveals the quantitative and qualitative findings of this study. Chapter five, is a discussion which provides the researcher's reflections on the study’s results, concluding statements, and suggestions for further research.
CHAPTER 2

Review of Related Research

Theoretical Framework

Urie Bronfenbrenner, a Russian-born American psychologist, coined the ecological systems theory, which recognizes that an environment can have a positive or negative impact on the development of one’s ecological system. In Bronfenbrenner’s theory, he specifically evaluates how environments shape one’s development. Bronfenbrenner recognizes the importance of nature and nurture, both being evaluated rather than compared against each other as nature vs. nurture. In the introduction to his book he states, “The main thesis of this volume is that, to a greater extent than for any other species, human beings create the environments that shape the course of human development….and this agency makes humans—for better or for worse—active producers of their own development,” (Bronfenbrenner, 2005, p. xxviii).

Bronfenbrenner (2005) coined the Ecological Systems Theory to explicate how the intrinsic qualities of children and their environments interact to influence how they grow and develop. The Ecological Systems Theory recognizes the importance of studying and evaluating children in multiple environments, otherwise known as ecological systems, as a process in understanding their development (Bronfenbrenner, 2005). The Ecological Systems Theory classifies contexts of development into five levels of external influence. These levels are categorized from the most immediate environment to the least influential. The five levels from most intimate to broadest are microsystem, mesosystem, exosystem, macrosystem, and chronosystem (The Psychology Notes Headquarters, 2019). The levels are outlined in Figure 1.
The Bronfenbrenner theory proposes that the microsystem is the smallest and most direct environment in which children live. This environment includes a child’s home, school or daycare, peer group, and/or community environment. Children interact within this category by the personal relationships they encounter with family members, classmates, teachers, and/or caregivers. The interactions that occur within this system will impact a child’s development (The Psychology Notes Headquarters, 2019).

This current study is in direct alignment with Bronfenbrenner's Ecological Systems Theory. The present research evaluated the impact the microsystem, the most immediate environment, had on the students' overall performance based upon the adaptive physical education environment. In essence, the adaptive physical education environment
environment in which children are educated shaped their social and physical development and progress.

**Related Research**

The purpose of this study was to determine if there was a positive relationship between physical and social growth and an inclusive physical education environment for students with severe cognitive disabilities. The research in the following sections contains summaries of studies whose authors investigate many of the different aspects of inclusion and segregated learning environments.

**Special education.** In the United States, special education has evolved to the programs and services that are presently offered to students today. Students with disabilities were not afforded the right to be educated against their non-disabled peers until most recently within the last forty years. In 1893, in the case of Watson v. City of Cambridge, the Supreme Judicial Court of Massachusetts “Ruled that a child who was ‘weak in the mind’ could not benefit from instruction, was troublesome to other children, and was unable to take ‘ordinary, decent physical care of himself’ could be expelled from school,” (Yell, Rogers, & Lodge Rogers, 1998, p. 220). For the majority of the twentieth century, the courts continued to rule against the current rights of disabled persons and upheld legislation to exclude children with disabilities from school. In 1958, the Supreme Court of Illinois continued with this trend. In the case of Department of Public Welfare v. Haas, Yell, Rogers, & Lodge Rogers (1998) described that the court stated:

The state’s existing compulsory attendance legislation did not require the state to provide a free public education for the ‘feeble minded’ or children who were
‘mentally deficient’ and who because of their limited intelligence, were unable to reap the benefits of a good education. (p. 220)

In 1969, it was considered a crime for North Carolina parents to persist in sending their disabled children to school. In the late 1960s and early 1970s individual states began to pass laws related to the education of students with disabilities. However, without consistent federal regulation, the educational rights were uneven and hindered by the absence of funding (Yell, Rogers, & Lodge Rogers, 1998).

In 1975, U.S. Congress enacted the Education for All Handicapped Children Act, otherwise known as Public Law (P.L.)94-142. This law and subsequent amendments are reflected in the most current legislation, the Individuals with Disabilities Act (IDEA; P.L. 108-446). The federal mandates of IDEA allow disabled students mandated programs and services while ensuring their civil rights and proving equal access to education (Individuals with Disabilities Act of 1990, 2004).

Prior to the implementation of P.L. 94-142, many individuals with disabilities were institutionalized in state facilities with minimal food, clothing, and shelter. People with disabilities were provided basic care, rather than educational instruction and/or rehabilitation. Individuals identified as having a disability were often excluded from school prior to the enactment of the law, as described by the U.S. Department of Education’s summary of the impact of IDEA: “In 1970, U.S. schools educated only one in five children with disabilities, and many states had laws excluding children who were deaf, blind, emotionally disturbed, or mentally retarded” (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2010, p. 3). In essence, disabled children were segregated and denied access to education and opportunities to acquire new
skills. Furthermore, the resources were not available for children with severe disabilities to be educated in their neighborhood schools, alongside their typical developing peers (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2010).

With the landmark passing of P.L. 94-142, children regardless of their disability were granted a free appropriate public education. The law encompassed guidelines to “improve how children with disabilities were identified and educated, evaluate the success of these efforts, and provide due process protection for children and families” (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2010, p. 5). The law underwent multiple amendments from 1975 until 2004, effectively changing the name to IDEA in 1990. In 1997 and 2004, additional amendments were passed to ensure equality in education. Specifically, during the 1980s, “IDEA supported research institutes and model demonstration projects that developed and validated effective approaches for integrating children with significant disabilities with their nondisabled family members at home and their nondisabled classmates at school,” (U.S. Department of Education, Office of Special Education and Rehabilitative Services, 2010, p. 7). Since then, IDEA has consistently supported the notion of including children with disabilities in the least restrictive environment alongside their typically developing peers to the maximum extent. Consistent progress has been made towards improving the education of students with disabilities while protecting their rights to a free appropriate public education.

Under IDEA, a student with disabilities are required to have an Individualized Education Program (IEP). An IEP identified a student’s present levels of performance,
needs related to the disability, and impact on involvement/progress in the general curriculum. The present levels of performance must consider (1) academic achievement, functional performance, and learning, (2) social development, (3) physical development, and (4) management needs. The student’s present levels of performance provide the foundational basis for generating goals, supports, and services that are specifically designed for each individual student (Part 200 - Students with Disabilities, 2016).

**Physical education.** In Western society, the development of physical education began in the Late 17th century. In 1885, Luther Halsey Gulick identified physical education as a “new profession”, subsequently that year the American Association for the Advancement of Physical Education was formed (Guedes, 2007). Physical Education has continued to evolve and develop in schools over the last two centuries. In 1959, at the AASPER National Conference on Fitness of Children of Elementary School age, concerns emerged regarding the instruction schools were providing for physical education. At this time, it was suggested by practitioners that schools afford daily instructional periods that encompassed creativity and vigorous physical activity (Lumpkin, 1985). Currently, New York state educational standards require physical education for all students from grades kindergarten through 12th. According to New York State Education Department (2019),

When students reach the commencement level of the learning standards for physical education, they will have the knowledge and skills to participate in a variety of healthy activities; understand and appreciate the benefits of maintaining a healthful lifestyle; understand how to evaluate and access resources in their community to pursue a healthy and active life; and will be aware of the many career opportunities available in this field. (para.1)

**Adaptive physical education.** IDEA requires schools to provide students with special needs access to the general education curriculum. All classes must provide
students with disabilities the support necessary to allow them to benefit from the
instructional curriculum. General education physical education can be challenging for
students with severe cognitive and/or physical disabilities, therefore, adaptive physical
education is a viable program option that may meet their needs.

The term adaptive physical education is identified in Part 300 of the Code of
Federal Regulations and Part 200 and Part 135 of the Commissioner’s Regulations. The
term adaptive physical education is defined as:

A specially designed program of developmental activities, games, sports, and
rhythms suited to the interests, capabilities, and limitations of students with
disabilities who may not safely or successfully engage in unrestricted
participation in the activities of the regular physical education program. (Part 200
- Students with Disabilities, 2016, p. 1)

Winnick and Poretta (2017) recognize adaptive physical education as a subsidiary of
physical education that provides “safe, personally satisfying and successful experiences
for students of varying abilities,” (p. 4).

**Peer mentors.** Peer mentoring programs are becoming increasingly widespread in
schools nationwide. Schools often use peer-mediation to support students in multiple
areas, which typically involves targeting skills by connecting same-aged peers in the
instruction and intervention is an evidence-based practice in which peers serve to support
both the academic achievement and social-skill development of students with specific
learning needs” (p. 46). Peer mentors can be used to supplement teacher-delivered
instruction by utilizing peers to promote learning through prompting, social initiations,
and modeling. Peers often provide immediate direct feedback to one another which
increases students’ opportunities to respond (Bene, Banda, & Brown, 2014).
Social learning theory, as described by Bandura (1977), implies that peer-mediated instructional arrangements that involve the use of observational learning, imitation, or modeling are most successful. This indicates that classroom arrangements that lend themselves to peer interaction for learning, specifically peer-mediated instructional arrangements, should be considered when designing classes for children with disabilities (Bene, Banda, & Brown, 2014).

Peer mediated instruction is instructional research based strategy utilized to develop and support students with and without disabilities. According to Bui, Quirk, Almazan, and Valenti (2010), positive outcomes were noted in “studies investigating the use of class-wide peer tutoring models (CWPT) where students serve as tutors and tutees in acquiring basic academic skills and factual knowledge,” (p. 4). Additionally, an increase in levels of engagement and academic responses as well as academic gains were noted specifically for students with moderate to severe disabilities (Bui, Quirk, Almazan, & Valenti, 2010).

Inclusion. The term inclusion is not located in special education law, however it is often used to describe an environment. The environment or philosophy of inclusion generally refers to the concept of integrating students with disabilities with general education students. Inclusion refers to the notion of students with disabilities attending classes alongside their typically developing peers. The belief of inclusion is a commitment to educate students to the maximum extent possible in the school or classroom they would otherwise attend if they did not have a disability (National Association of Special Education Teachers, 2018/2019). Over the last three decades, the terms used to denote inclusion have continued to evolve as the practice itself has as well.
Words used to describe educating students with disabilities alongside general education students include mainstreaming, integration, and inclusion. MCIE defines the three as the following:

Mainstreaming operated on the notion of readiness for general education while integration focused on the enhancement of students’ social development. From a legislative, moral, and efficacy standpoint, the general education classroom is now the placement of choice for students with disabilities. (Bui, Quirk, Almazan, & Valenti, 2010, p. 9)

**Social abilities.** Students require social skills in order to interact and communicate with others. Social skills are characteristics or modules of behavior that help people understand and adapt to various social settings (Steedly, Schwartz, Levin, & Luke, 2008). According to Walker (1983, as cited in Steedly et al., 2008) social skills are:

A set of competencies that a) allow an individual to initiate and maintain positive social relationships, b) contribute to peer acceptance and to a satisfactory school adjustment, and c) allow an individual to cope effectively with the larger social environment. (p. 2)

Students use social skills for interacting with one another and navigating their environment using social conventions.

Difficulty acquiring social skills presents in different levels amongst students with and without disabilities. The degree in which students are able to establish and maintain acceptable interpersonal relationships, obtain peer acceptance, create and uphold friendships and terminate negative interpersonal relationships is indicative of their social competence. It is necessary for students to gain social skills in order to support their lifelong abilities in community and work settings. Student with disabilities that have well-developed social skills are able to develop positive peer relationships, school success, and successful post-secondary roles of community member or employee (National
Scholars estimate that approximately 75% of Learning Disabled students suffer from various indicators of social skill deficits that impact their ability to learn in school (Steedly, Schwartz, Levin, & Luke, 2008).

Students with severe cognitive impairments also have low adaptive abilities. Inclusive of a student's adaptive abilities are their abilities to communicate and socialize. According to Webster (2019), “Many children with disabilities may be less mature than their typical peers and may reflect less understanding of how to manage their own emotions,” (para.3). Teachers utilize many strategies to improve students' social interactions with one another. Through explicit modeling, role-playing, scripting, and social narratives students can begin to learn and generalize appropriate interactions with one another (Webster, 2019).

**Physical abilities.** Students rely on their physical or motor abilities to negotiate their environment on a daily basis. Clark (1994) defined motor development as a “change in motor behavior over the lifespan and the processes that underlie the change.” (p. 245). Further, Clark (1994) defines gross motor skills as “motor skills that involve the large, force-producing muscles of the trunk, arms and legs,” (p. 245). Gross motor skills include movement actions that are used to transport oneself from one location to another and/or to propel and receive objects. The development of gross motor skills is critical to a child being able to interact with their environment. Students that are identified as having deficits in gross motor development may experience a lifetime of problems with motor skills (Ulrich, 2000).
As part of a public education students receive, it is imperative to not overlook gross motor development when evaluating or creating programs. Ulrich (2000) stresses that “During the early years, children spend much time interacting with their environment through movement activities such as crawling, creeping, walking and jumping. This developmental period is critical if the child is to master the gross motor skills,” (p. 2).

A student's ability to function physically can have impacts not only on their ability to negotiate their environment but also on how they are viewed by their peers. According to Ulrich (2000):

A child who is less skilled than most of his or her peers will generally be chosen last to participate in group games during recess and after-school activities. The consequence of consistently being selected last or not at all must have a negative impact on a child’s physical self-concept and motivation to be active. (p. 2)

The physical limitations students may have can therefore impact their social abilities as well.

Students with severe cognitive disabilities often have barriers to participating in physical activity. As Rimmer and Marques (2012) explain,

Engaging in a healthy lifestyle with a disability can be a daunting task—physical activity generally requires elements of strength, endurance, balance, and coordination that are taken for granted. In people with disabilities, one or more physical attributes might be affected by disability, which limits access to sport, fitness, and work or household-related physical activity. (p. 193)

Children with disabilities often have more difficulty engaging in physical activity than adults. Children that have deficits in balance, strength coordination, power, and aerobic fitness often struggle to compete with their peers, leading to sedentary behavior (Rimmer & Marques, 2012).
Ulrich (2000) and Rimmer and Marques (2012) both recognize the importance of physical and social needs being addressed for students with disabilities. Ulrich recognizes that students with inadequate movement skills are often asked less frequently to participate in physical activities by their peers. He states,

Children with disabilities who possess lower social skills due to fewer opportunities to interact socially with their peers should be provided with intensive instruction and therapy designed to significantly improve their motor skills development. It makes sense that a child with a developmental disability, who possesses adequate movement skills would be asked to participate in physical activities more often by his or her peers. (Ulrich, 2000, p. 2)

Rimmer and Marques (2012) identify that schools need to make appropriate accommodations for students to participate in physical education programs. They recognize, “Society has to promote an inclusive approach to community programmes and services that recognises and supports the need of people with disabilities” (Rimmer & Marques, 2012, p. 194). The inclusion of students with disabilities in physical environments can create additional opportunities for participation alongside their typically developing peers.

**Relationship Between Prior Research and Present Study**

Educators hold many different attitudes about the educational environment of an inclusion classroom. All authors of prior research recognized that inclusion was a viable placement for most special education students. In the study conducted by Cronic, Marino, Miller, and Monahan (1997), teachers, administrators, and counselors felt that inclusion generally benefited most students and they had positive attitudes towards the entire idea of inclusion. The authors of this study felt that the attitudes that the principals and
teachers of the inclusion program held toward the inclusion of students with disabilities strongly affected the success of inclusion.

Ingram (1997) also discussed the behaviors that were found in principals. She further investigated the effects that the principals’ behaviors not only had on the inclusion program but the teachers’ performance and attitudes towards various topics as well. In the study conducted by Beirne-Smith et al. (2000), the researchers determined that guidance and support from administrators was imperative in the success of an inclusive program. Together all of these authors suggested that leadership behaviors and experience had a role in determining whether an inclusion program was a success or not.

The inclusion of special needs students in physical education presents many issues that teachers must address. The physical nature of activities, equipment, and grouping of students all are variables teachers must consider. In order for an inclusive environment to be a success, the role of the teacher is vital. Many researchers seek to understand the perceptions of multiple stakeholders regarding inclusive and segregated classrooms; The perception of the teacher is perhaps one of the most influential. In the qualitative study conducted by Morley, Bailey, Tan, and Cooke (2005) they seek to understand the perceptions of secondary school teachers regarding including children with disabilities in mainstream secondary physical education.

education. Black and Haskins’s (1996) research was based upon a three-tiered system in which special education students participate in activities.

In the Moley et al. (2005) qualitative study, researchers invited forty-three secondary schools to participate in a large city North of England; the researchers received a response rate of 100 percent. Seven researchers met prior to the interviewing process in order to clarify the format, interview structure, and any ambiguities with terminology. Six schools participated in pilot interviews causing the researchers to modify their interview schedule, the wording of questions, and the way in which the interviewer began each interview. The interviews were recorded and transcribed verbatim by a third party. The final interview scheduled was comprised of four sections. The sections identified were: inclusive PE, definitions and purpose, professional development, resourcing and support of children with special needs, and contextual elements. The information gathered from the interviews was analyzed using a method of selective coding. The software system of NVivo was used further to complete a cross-analysis of the data.

Morley et al. (2005) determined that overall the teachers viewed “inclusion as a journey, or progressive path, towards an ultimate target,” (p. 91). The teachers in their study also identified several barriers that prohibited inclusion. Barriers identified were extra planning on the part of the teachers, teachers’ perceptions of their own inadequacy, lack of knowledge of how to adapt activities, and the severity of students’ needs. The research yielded clear implications that teacher training and professional development are vital in achieving inclusive physical education environments. The teachers also identified variability in student abilities as a common concept of inclusion. This was also connected to the extent teachers believed they could include a special needs student in a lesson. A
main identified difference between inclusion in physical education and other subject areas was additional support. The teachers commented on lack of support from Learning Support Assistants (LSA) The perception was that the students were supported in other learning areas but rarely in physical education class (PE).

Overall, the research indicated that special education students have many different levels and abilities which can be more of a challenge in physical education than other subject areas. Further, the demands of the subject are unique and require subject-specific approaches to identifying and providing for students’ needs. Lastly, the teachers involved in the research identified that the challenges of inclusion predisposed their attitudes as to the range in which inclusion could be reached.

The authors did not explore correlations to the variables of the participants. The gender, and experience of the teacher was not correlated to their attitudes. The authors recognize that the teachers’ experiences could have had an impact on their responses. Additionally, teachers had multiple interpretations of special needs students, which may have resulted in confusion regarding the inclusion of students.

In order for an inclusion environment to be a success, educators must not rely on the laws but themselves. Many researchers seek to understand the perceptions of teachers, parents, and administrators regarding inclusive and segregated classrooms; often the perception of the student is overlooked. In a qualitative study, Fitch (2003) sought to understand how included and excluded developmentally handicapped students perceive their educational experience. Fitch (2003) states that, “Social valuing theory (as opposed to labeling/deviance) argues that labels (names and categories) are discursively/
ideologically enacted; they are constructed, interpreted, internalized and legitimated in
and though the disciplinary technologies through which they are employed,” (p. 244).

In his qualitative study, Fitch (2003) completed observations and audiotaped
semi-structured interviews. He conducted formal interviews throughout an entire school
year with teachers. Student interview sessions were conducted over six years, using 15
written questions as the initial focus. The questions were geared to understand students’
perceptions of their placement, education and acceptance by teachers and classmates. The
student participants were all labeled “developmentally handicapped”; initially, only five
were in inclusive placements, and four were segregated. The students’ ages ranged from
nine to twelve years old. Further, he classified inclusive and transitionalist classrooms
within each setting. Fifteen teachers and two principals had experience with the students,
however, their philosophies were a mix of inclusive and traditionalist assumptions. Fitch
made reference to defining the classroom ideologies based on the research by Brantlinger
(1997).

Fitch (2003) determined that four themes emerged from his questioning. The first
area considered “Passing and Covering (I don’t mention it).” Students commonly never
discussed their label or special education program with others. The second common
theme Fitch coined as “Special Education as a Temporary Sanctuary.” The students
viewed themselves as in a temporary setting that was safe and where they belonged. The
third commonality that was established was “Confidence and Resignation, (I think I
won’t/They think I’m pretty smart).” Students in the inclusive class overall felt success,
confidence, and belonging. The students in the special program (the developmentally
handicapped special class) identified with their label and special class and exhibited less
confidence in their own competence. The last theme was coined, “Reversal (I’ve Really Changed My Mind).” This theme reflected on the type of classroom the students were participating in. Teachers’ classrooms (traditionalist vs. inclusive) aided the students in accepting their ability.

Overall, the research indicated that integrated classrooms were not identical with inclusive classrooms. The students’ perceptions appeared to adjust based on their circumstances. Changes in the school environment overall have a profound impact on students’ lives. The research only skims on teacher perceptions and ideologies. However, the research suggests that the ideology the teacher brings to the environment has the greatest impact.

The authors did not plainly state limitations within their study. However, this researcher noted that only 11 students were interviewed. Further, the author follows 11 students over time, however, he initially began with nine. The researchers interviewed teachers to determine their teaching ideology, yet the results suggest that the classroom environment (based on teacher philosophy) had a great impact. With the method of research being solely qualitative, and with a minimal number of participants, it is difficult to ascertain the significance of the results.

In a study completed by Klavina and Block (2008), the researchers assessed the effect of peer tutoring on the variables of physical and social interaction and instructional behaviors on students with severe and multiple disabilities at the elementary level. The study was conducted at two elementary schools from a mid-Atlantic state in the United States. The research included three elementary special education students and nine peer tutors selected through purposeful sampling.
The dependent variables of Klavina and Block’s (2008) study were the instructional and physical interaction behaviors between the students with and without disabilities. The researchers defined instructional interactions as “any verbal or non-verbal instructions received from/or directed,” (Klavina & Block, 2008, p.137). Physical interaction behaviors included one-on-one interactions related to the physical education activities. The study was conducted in an inclusive general physical education setting with three instructional models, teacher-directed, peer-mediated, and voluntary peer support. Peer tutors received three, thirty-minute training sessions, using a training manual called TIP-TAP steps (i.e. Tips to Teach, Assist and Practice). Prior to becoming a peer tutor, students needed to reach 90% proficiency of the criterion set from the TIP-TAP. During the physical education classes, peer tutors were prompted to interact with the students for the first twenty minutes, the last ten minutes were voluntary peer support.

Klavina and Block (2008) collected data via observations over 4 general physical education sessions. They videotaped all observations and analyzed them using the Computerized Evaluation Protocol of Interactions in Physical Education (CEPI-PE) which assesses three behavioral categories (instructional, physical, and social). During the peer-mediated and voluntary peer support environments, the instructional and physical interactions between students with disabilities and their typical peers increased. Students all showed an increase in engagement during the intervention. The first students had an average score of 50.3% for baseline and improved to an average score of 61.7%, the second student was 46.2% and increased to 68.9%, and the third student’s baseline was 61.3% and increased to 85% after the intervention. These results showed a positive impact between the independent variable (implementation of peer tutoring) and the
dependent variable (interaction behaviors between students with disabilities and peer tutors). Further, peer tutors rated the physical performance of their tutees as the following: four tutors rated them as “very good,” four as “good,” and one as “moderate.” Eight of the nine tutors indicated that their attitude towards the special education student in the study had improved; for the additional tutor, their attitude did not change.

In a 2005 study conducted by Ninot, Bilard, and Delignieres, the researchers evaluated the effects of an athletic program (integrated or segregated) on the athletic domain of perceived competence and general self-worth. Thirty-two females all having intellectual disabilities were divided into four homogeneous groups of eight. One group consisted of swimmers who partook in Special Olympics events, the second a group was swimmers who participated in integrated meets. Two other groups served as control groups: an adaptive physical activity group and a sedentary group. The groups served as the independent variables. The dependent variables were self-worth and perceived competence. To measure self-worth and perceived competence the researches used the Self-Perception Profile (SPP). The SPP was validated in French by Pierrehumbert et al. (1987). The domains within the test are scholastic and cognitive ability, social acceptance and popularity, athletic competence, and physical appearance and conduct. The researchers do not explicitly state the range of scores for the assessment.

Ninot, Bilard, and Delignieres (2005) administered athletic skills tests prior to the first swim meet and then after every two meets. The researchers used a one-way ANOVA at the beginning of the study to reveal that there was not difference between the domains of the dependent variables and the four independent variables. Further, the researchers evaluated sport performance, using the time of a 50 m breaststroke, and no significant
difference was found. At the completion of the study, a two-way analysis of variance was conducted to determine a significant effect within groupings. After a three year period, student swimming performance showed a significant effect of group $[F(2,263)=4.10, P<0.040]$, time $[F(10,263)=32.53, P<0.0001]$ and interaction $[F(20,263)=3.28, P<0.0001]$. A two-way ANOVA was conducted indicating that group, time, and interaction also had a significant difference in student’s athletic competence. In the area of general self-worth, the two-way ANOVA for repeated measures showed a significant difference for time, and not for groups and interaction. Overall, the results indicate that all four groups did not have a significant change in their self-worth. The integrated swimming group had a significantly lower perceived athletic competence, but also the greatest increase in athletic performance. The researchers believed the adolescents in the segregated environment tended to overestimate their physical competence, while the students in the integrated environment had a more realistic perception of their physical competence.

In a qualitative systematic review, Coates and Vickerman (2008) examined special education students’ experiences in physical education. The intention was to identify, appraise, select, and synthesize relevant research evidence from within the ten years preceding the article publication. Seven research articles were identified to meet the criteria. Six themes were identified as recurring issues within the literature relating to the experiences of special education needs. These needs were: experiences in PE, experiences of PE Teachers, discrimination by others, feelings of self-doubt, barriers of inclusion, empowerment, and consultation.
Previous literature indicates that children with special educational needs feel empowered when afforded the chance to determine their involvement in PE. According to Kristen et al. (2002) and Fitzgerald et al. (2003a), as cited in Coates and Vickerman (2008), “Children with special education needs gain enjoyment, as well as social, learning, and physical benefits from taking part in integrated and inclusive sporting activities,” (p. 170). Overall, special education students that are included in physical education with typically developing peers are encouraged to have social and physical inclusion.

In a qualitative study, Simpson and Mandich (2012) used a constructivist-grounded theory approach as described by Charmaz (2006) to study a similar topic. Teachers self-selected themselves for participation in the study by replying to a recruitment email sent from the school board’s research office, after approval from the university of the researcher and the school board. The researchers used semi-structured interviews to assess teachers’ feelings, experiences, and perspectives in implementing physical education curriculum and supporting the inclusion of students with a disability in physical education. Inductive content analysis was used in the analysis of the data. Five major themes emerged from the teacher interviews. The areas discussed included: the teacher, the school environment, school board supports, community resources, and ministry curriculum. Results suggested that including students in physical education is possible if teachers have access to appropriate supports. These supports include providing necessary staffing to support teachers in PE. For example, providing opportunities for educational assistants to attend PE with students, and having appointed specialist and physical education teacher provide consultation. The researchers
also determined that having access to adapted and specialized sports equipment can facilitate inclusive physical education but is not always necessary if teachers are given occasions and training to adapt curriculum expectations and IEPs to suit the individual students’ needs (Simpson & Mandich, 2012).

**Summary**

Overall, previous research indicates that special education students have many different levels and abilities, which can be more of a challenge in physical education than other subject areas. Further, the demands of the subject are unique and require a subject-specific approach to identifying and providing for students’ needs. Lastly, the teachers involved in the research identified the challenges of inclusion predisposed their attitudes as to the range in which inclusion could be reached.

**Conceptual Framework**

The conceptual framework of the current research study is outlined in Figure 2. The framework is based on evaluating the two Adaptive Physical Education approaches, utilizing a control group of segregated students and a treatment group of students receiving physical education with peer mentors. The researcher evaluated the impact the environments have on students' social abilities and gross motor (physical) abilities. This information was assessed to determine the overall outcome of the program.
Figure 2. Conceptual Framework.
CHAPTER 3

Methods and Procedures

Introduction

The purpose of this study was to assess students’ physical and social progress in both inclusive and segregated adaptive physical education environments. The researcher evaluated the physical and social performance of students with severe disabilities in both inclusive physical education and segregated adaptive physical education environments based upon standardized testing and teachers’ perceptions. Qualitative and quantitative research methods were used to assess student’s physical and social growth. This chapter defines the research setting and sample, data collection, and analysis methods.

Specific Research Questions and Hypotheses

The overarching question and inquiry upon which this study was based aimed to determine which of these environments had the greatest positive impact on student achievement. The following specific research questions guided this study.

Research question one. To what extent do peer mentors impact gross motor skills performance of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class.

The following hypotheses were set:

H₀: There is no difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors.

H₁: There is a difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors.
**Research question two.** To what extent do peer mentors impact social skills of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class, based on the perceptions of the educators involved in the physical education program.

**Rationale for Research Approach**

This research was a mixed-method, exploratory case study, as the researcher investigated the physical and social growth depending on the environment in which the students were educated in for adaptive physical education. A mixed methods research design involves collecting, analyzing, and “mixing” both quantitative and qualitative data to evaluate a research problem (Creswell & Poth, 2017). According to Creswell and Poth (2017), “Case study research involves the study of an issue explored through one or more cases within a bounded system (i.e., a setting, a context),” (p.73). This researcher explored the social and physical growth of students in adaptive physical education environments while collecting in-depth data through standardized testing and interviews.

In order to obtain a thorough understanding of the topic, this study was conducted using the convergent parallel design, a mixed-methods design. The research process can be symbolized as qualitative and quantitative (QUAL+QUAN). A convergent parallel design requires that the researcher simultaneously conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently, and interprets the results together (Creswell & Poth, 2017). In using a convergent mixed method design, the qualitative and
quantitative data will be compared simultaneously in order to evaluate the students’
physical and social abilities.

The researcher was able to triangulate the data by directly comparing the
quantitative statistical results and qualitative findings from the semi-structured interviews
and observations. In the research process, two datasets were obtained, analyzed
separately, and compared. The research process that was used in this study is displayed in
Figure 3.

Figure 3. Convergent Mixed Parallel Design. The research process in this study used the
convergent mixed-parallel design.

According to Leedy and Ormrod (2005), “Qualitative research involves looking at
characteristics, or qualities, that cannot easily be reduced to numerical values. A
qualitative researcher typically aims to examine the many nuances and complexities of a
particular phenomenon,” (p. 94). Interviews were conducted with several staff members
to ascertain the social growth of students, as this is difficult to assess numerically.

Research Setting/Context

The location of this study was at an elementary school located within the
boundaries of the Suffolk County, NY. The elementary school is one of eleven schools in
the suburban school district, serving over 7,800 students from pre-kindergarten through
high school. At the time the study took place, this elementary school had an enrollment of 612 students, of which sixty-four students were identified as severely cognitively disabled. Prior to the start of this study, the sixty-four students with significant cognitive impairments were segregated for the entire school day, only remaining with their disabled peers. This cohort of students did not have any interaction with typically developing general education students. For the previous two school years, the special class environments at this elementary school increased, in an effort to accommodate students who historically were sent out of district. During the 2016-2017 school year, the population of severely disabled students at this school was 7.85%. For the 2018-2019 school year, the population was 12.56%.

Semi-structured interviews were conducted to garner the social abilities of the control group and treatment group. Eleven participants were contacted requesting participation in semi-structured interviews. The educators contacted consisted of three physical education teachers, a psychologist, four special education teachers, a principal, an athletic director, and an occupational therapist. Purposive sampling was used to obtain participants. The semi-structured interview questions were previously piloted with an elementary principal that has adaptive physical education students in their building.

**Research Sample and Data Sources**

This target population of this study was five self-contained classes, totaling thirty-eight special education students. Nineteen of the special education students were paired with peer mentors during adaptive physical education. The peer mentors participating in this study were general education students that received three hours of mentor training prior to the start of the intervention. The control group consisted of nineteen special
education students who were isolated in special education for the entire school day; these students did not have peer mentors during physical education. This researcher used convenience sampling, identifying students in five of the eight classes. Each special education student in the peer mentor group had an opportunity to work with three rotating peer mentors during their adaptive physical education class. The special education students in this study were ungraded, all representing the age groups of 8-11 years old.

**Data Collection Methods/Instrumentation**

The instrument used for this study was the Test of Gross Motor Development, 2nd Edition (TGMD-2). The TGMD-2 is a norm-referenced measure of common gross motor skills made up of two subtests, locomotor and object control. The locomotor subtest evaluates abilities involved in moving the center of gravity from one point to another. The object control subtest evaluates students’ abilities projecting and receiving objects. The TGMD-2 is appropriate for students ages 3-0 (three years, zero months) through 10-11 (ten years, eleven months) who are significantly impaired (skills are 1.5 standard deviations below the norm) compared to their same-age peers in gross motor skill development. Upon completion of the evaluation, raw scores were converted to obtain standard scores, percentile scores, age equivalents, and gross motor quotients. This instrument and its administration met all guidelines for protecting human subjects.

The TGMD-2 was norm referenced with 1,208 people across 10 states in the Fall of 1997, the Spring of 1998, and Fall of 1998. It was stratified by age, relative to geography, gender, race, and residence. The assessment was found to be reliable and valid. The reliability coefficients for the Locomotor subtest average .85, the Object Control subtest average .88, and the Gross Motor composite average .91. The Standard
Error of Measurement (SEM) is 1 at every age interval for both subtests. The coefficient alpha is above .90 for the subtest and the composite for all selected subgroups.

The rationale behind using the TGMD-2 was to collect the gross motor skills of the special education students in adaptive physical education. The evaluator’s manual clearly indicates, “the effectiveness of a specific gross motor development program can be evaluated by selecting students from various classes, pretesting those students, implementing the instructional program, and following up with a posttest of the selected students” (Ulrich, 2000, p. 5). Prior to administering the assessment, all parents/guardians received written notification and had the option for their child to not be assessed. The assessment was administered one-on-one by a New York State Certified Physical Education teacher immediately before (pretest) the implementation of peer mentors in physical education classes. After one year of instruction, the TGMD-2 was administered again (posttest) to both the control group and the peer mentor group.

Semi-structured interviews were conducted to ascertain the perceived level of social abilities for the students in the study. The physical education teachers, athletic director, occupational therapist, psychologist, special education teachers, and principal participated in order for the researcher to gain rich descriptions from educators regarding students’ social abilities. The data was collected using semi-structured interview questions.

The researcher conducted non-participant observations as an observer in both of the two environments. According to Creswell (2012), an “Observation is the process of gathering open-ended, firsthand information by observing people and places at a research site,” (p. 212). Specifically, a non-participant observer is defined as, “an observer who
visits a site and records notes without becoming involved in the activities of the participants” (Creswell, 2012, p. 214). The researcher recorded observations in both settings and kept a journal of observations. In conducting observations, the researcher had the ability to record information as it occurred in both adaptive physical education settings and to study actual behavior and skills of the students in both environments.

**Data Analysis**

The quantitative data was collected during the school day. The researcher imported the data into SPSS to determine if there was a significant difference between variables. The data was screened for outliers and then checked for skewness and kurtosis. The z scores for the pre-test were used to determine univariate outliers. Any z value greater than +2.5(3.0) or larger than -2.5 (3.0) is considered unlikely and could be considered an outlier (Hair et al., 2010, as cited in Meyers et al., 2003). Skewness and Kurtosis were checked to determine a normal distribution. An independent-samples t-test was conducted to compare the adaptive physical education environment to the pre and posttests of the TGMD-2. Paired t-tests were run to determine if the pre-test and post-test were highly correlated. Further, independent t-tests were conducted to test Levene’s Test of Homogeneity in order to determine if the variance was equal across groups. A one-way between-subjects ANOVA was conducted to compare the effect of the adaptive physical education environment on the TGMD-2 post-test results.

A two-way between-subjects ANCOVA was used to evaluate the effects of the adaptive physical education environment. The two independent variables in this study were the time of the test and the adaptive physical education environment (segregated and peer mentor). The dependent variable was the TGMD-2, post-test, with higher scores
indicating higher levels of gross motor abilities. An alpha level of .05 was used for the initial analyses.

The qualitative portion of the research was conducted using semi-structured interviews and observations. Interviews were transcribed and coded to discover themes using NVivo software. The researcher assessed the themes that emerged from the data. NVivo was used to conduct matrix coding queries, searching for patterns across themes, and decompose nodes according to dissimilar descriptive categories.

The researcher then used coding to evaluate the participants’ voices in the data. Saldaña (2016) divided the first cycle coding into seven subcategories: grammatical, elemental, affective, literary and language, exploratory, and procedural. Inside each of these subgroups were specific types of coding. According to Saldaña (2016), one coding method may be adequate for a study, however at times a researcher may need to determine two or more coding methods to meet the requirements of the study; as he explains, “The primary goal during second cycle coding is to develop a sense of categorical, thematic, conceptual, and/or theoretical organization from your array of first cycle codes,” (p. 234). The researcher evaluated the cycle and codes that emerged as themes for this study.

In summary, the relationship between the adaptive physical education environment and physical and social abilities were evaluated through the collection of quantitative and qualitative data. Using a convergent mixed method design this researcher measured multiple data sources to determine physical and social growth dependent upon environments.
CHAPTER 4

Results

The purpose of this chapter is to present the findings for the overarching question of this research study, which is to determine which of the two environments of adaptive physical education had the greatest positive impact on student achievement. Additionally, the specific research questions must be answered. The findings of this chapter were based on three data sources: a quantitative analysis of the results from the Test of Gross Motor Development-2, semi-structured interviews, and non-participant observations. The results of this research offer insights into the environment in which students made the most overall growth while in adaptive physical education, which will be presented in Chapter Five of the study.

The data collection was completed in three phases. The first phase was obtaining the district’s data on student performance on the Test of Gross Motor Development-2. The test was administered to all adaptive physical education students in the fall of 2018 and then again in the spring of 2019. This data was then analyzed in SPSS, which will be outlined later in the chapter. The second phase included semi-structured interviews with eight participants. The participants included an athletic director, three physical education teachers, a psychologist, a building principal, an occupational therapist and one special education teacher. The third phase was four non-participant observations, two in each environment. The observations were forty minutes in duration. Two segregated adaptive physical education classes were observed twice and two adaptive physical education classes were observed twice. Overall, four, forty minute observations were conducted. The information shared through the semi-structured interviews and non-participant
observations gleamed to be most valuable in obtaining a thorough understanding of the student's social abilities in both settings.

Quantitative Analysis

The purpose of the research was to determine if a difference was present in adaptive physical education students’ gross motor skill growth based upon the environment. This researcher set the following hypotheses. The null hypothesis was: there is no difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors. The alternative hypothesis was: there is a difference in students’ gross motor skill growth in the segregated adaptive physical education or adaptive physical education with peer mentors.

The data was screened for outliers and then checked for skewness and kurtosis. The z scores for the pre-test were run to determine univariate outliers. Any z value greater than +2.5 (3.0) or larger than -2.5 (3.0) is considered unlikely and could be considered an outlier (Hair et al., 2010, as cited in Meyers et al., 2003). The z scores ranged from -1.22 to 2.33. Skewness and Kurtosis were checked to determine a normal distribution. The Gross Motor Quotient pre-test scores ranged from 46 to 88 (M=60.45, SD=11.813). Scores were normally distributed with a skewedness of .638 (SE=0.383) and a kurtosis of -3.85 (SE=0.75).

An independent-samples t-test was conducted to compare the adaptive physical education environment to the pre and posttests of the TGMD-2. Paired t-tests were run indicating the pre-test and post-test were highly correlated, P<0.00. Independent t-tests were run to test Levene’s Test of Homogeneity in order to determine if the variance was equal across groups. This test was found to be statistically non-significant, t(34.283)=
Further, the students in the adaptive physical education class with peer mentors (M=71.24, SD=.998) yielded higher post test scores than those students in the segregated adaptive physical education class (M=63.284, SD=.998). As Figure 4 below depicts the estimated marginal means of the posttest of the peer mentor environment is higher than that of the segregated environment.

![Estimated Marginal Means of Posttest](image)

*Figure 4. Estimate Marginal Means of Posttest.*

A one-way between subjects ANOVA was conducted to compare the effect of the adaptive physical education environment on the TGMD-2 post-test results. There was a significant effect of the adaptive physical education environment on the TGMD-2 post-test results, at the p<.05 level (Table 3).
Table 3

Tests of Between-Subjects Effects

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</table>

a. R Squared = .885 (Adjusted R Squared = .878)

A two-way between subjects ANCOVA was conducted to evaluate the effects of the adaptive physical education environment. The two independent variables in this study were the time of test and the adaptive physical education environment (segregated and peer mentor). The dependent variable was the TGMD-2 post-test, with higher scores indicating higher levels of gross motor abilities. An alpha level of .05 was used for the initial analyses. The results for the two-way ANCOVA indicated a significant effect for the adaptive physical education environment F(1,36) = 32.97, p<0.00 (Table 3).

Table 4

Two Way ANCOVA Test Between Subjects

<table>
<thead>
<tr>
<th>Source</th>
<th>time_of_test</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>time_of_test</td>
<td>Linear</td>
<td>882.645</td>
<td>1</td>
<td>882.645</td>
<td>108.156</td>
<td>.000</td>
</tr>
<tr>
<td>time_of_test * Treatment</td>
<td>Linear</td>
<td>269.066</td>
<td>1</td>
<td>269.066</td>
<td>32.970</td>
<td>.000</td>
</tr>
</tbody>
</table>
Qualitative Analysis

The second phase of data collection, the semi-structured interviews and non-participant observations, served as the qualitative component in this mixed-method design. The information from the semi-structured interviews and observations was used to answer the second research question: To what extent do peer mentors impact social skills of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class, based on the perceptions of the educators involved in the physical education program?

Non-Participant Observations

On four different occasions this researcher conducted non-participant observations. The sessions lasted forty minutes in duration. Two sessions were conducted in the adaptive physical education class with peer mentors and two sessions were conducted in the segregated adaptive physical education class. The purpose of the observations was to collect data within the two adaptive physical education environments without becoming involved in the activities of the participants. An observational protocol was used to record information during the observation sessions. The information collected included a description of activities during the observation as well as quotes that were heard. The information gathered during the observations was reflected upon and triangulated with the semi-structured interviews and quantitative results.
**Observation session one.** The segregated adaptive physical education class was in the gymnasium participating in structured, organized tasks aligned with the students' needs and IEP goals. Present in the gymnasium were two teaching assistants, one teacher’s aide, one physical education teacher, and eight students with severe cognitive disabilities. Students were using the perimeter of the gymnasium to perform different tasks (i.e. walking and jogging). The students were given instructions to line up to get a drink of water and were instructed to go back to the center of the gymnasium with the physical education teacher and other adults. In the center of the gymnasium, the student practiced yoga poses, balance activities, and a stretching routine. The teachers used positive praise for the students and encouraged and motivated them. Several students were reinforced with individualized token boards. One student was displaying tantrum-like behavior and required the school psychologist to be called for assistance. The school psychologist and teaching assistant prompted the student for compliance while the other adults carried out instruction in the class. The social interactions that naturally occurred were between student and adult. The students were not observed to have any student to student interaction. The physical education teacher continued to demonstrate activities and the students and other adults followed along. After the students were stretched out, they were instructed to go to the west wall. Teachers set up a circle with cones and instructed students to perform structured locomotor movements around the cones, working on directions, listening, and building skills. The students completed the skills one at time. Five of the eight students were observed to hold the hand of an adult while completing the activities. Upon all of the students completing the activities, the students
lined up at the door of the gymnasium and their classroom teacher arrived. The students departed the gymnasium.

**Observation session two.** Eighteen students entered the gymnasium and sat in their assigned squad spots. The teachers had previously informed the observer that nine of the students were identified as students with severe cognitive disabilities and nine additional students served as peer mentors. Students, under the direction of the teacher and two teaching assistants, performed a warm-up activity including jumping jacks, curl-ups, etc. Student leaders counted out loud in English and Spanish. Students were asked to “engage their abdominal muscles” during core exercises and were praised with positive reinforcement from the adults. The physical education teacher set-up cones in an oval shape and students were instructed to jog around the cones to increase heart rates and prepare for the main activity. Groups were instructed to run/jog and then get water while the next group ran/jogged. All the while, peer mentors worked with the adaptive physical education students. Some of the pairs were observed to be holding hands. Students were observed to be laughing, giggling, and having conversations. One group stopped and a peer was observed to tie another’s shoe.

The physical education teacher asked her students to then sit with their partners, to review stations. She used student and teacher demonstration strategies to review the five stations the students were to perform. The teacher asked the students, "What muscle did we use last time for bands?" Students’ response was “triceps.” Students worked in each station and rotated. If a student and buddy needed water, they were instructed to jog to the water fountain. The students completed five stations: resistance band - deltoid raise - upper body; table top pose and touch feet with partner; core - carpet square race –
cardio; balance board catch – balance; high knees and soccer kick – legs. The physical education teacher monitored and worked with each group at stations, ensuring that all students achieved proper technique/form and success. After completing the stations, students were instructed to go onto the other side of the gym where the teacher and staff used mindfulness and meditation for the cool down. The special education teacher then arrived to return her students to class. The physical education teacher asked the general education students to reflect on their experiences with their peers. Two students shared. A female student shared, “I know Gianna doesn’t talk but she was having a great time today because she was smiling a squealing. When she squeals really loud, she’s having fun.” A male student added, “Logan was getting frustrated on the balance board catch, but I kept telling him he was doing a great job and he gave me a high five.” The physical education teacher provided verbal feedback to the general education students and they were then dismissed back to their class.

Observation session three. The third observation session was conducted in the adaptive physical education class with peer mentors. The students entered the gymnasium and stood on the east side of the gymnasium. Present in the class were the physical education teacher, two teaching assistants and sixteen children, eight with severe cognitive disabilities and eight peer mentors. The physical education teacher began the lesson by speaking about the importance of cardiovascular activities, flexibility, muscle strength, and muscle endurance. Students took ownership in the process of the warm-up by leading the warm-ups. Students stood in front of one of ten signs that designated each warm-up activity. Students instructed the class and once each activity began the class in unison counted together. The ten designated activities were: 20 jumping jacks, sit and
reach, double crunches, boat pose, squat thrusts, push-ups, mountain climbers, opposite crunches, downward dog, and squat jumps. After the warm-ups were completed, students were instructed to go into the center circle of the gymnasium with their partners. Student completed the activities in pairs. The teacher and teaching assistants circulated the gymnasium providing feedback to the students. The students were interacting with one another while completing the tasks. The students appeared to be actively engaged and independently engaged in each station without the support of adult facilitation. The physical education teacher then introduced the first activity of the day, 'Barnyard Tag.' Using different locomotor movements, students moved throughout the gymnasium in pairs. Several students were chosen as the taggers. Other students had rings (savers - super chickens). If a student was tagged with a noodle, they would freeze in a chicken position (standing tall with one hand in the air). The super chickens would move around with the rings and hand them off to people who were frozen. Once a chicken received a ring from a super chicken, they were free to move around the gym. Any student who had a ring must move around the gym looking for frozen students to save. After this warm-up, the teacher assessed students' heart rates by asking them to put hand over heart and feel the beat of their heart. The teachers asked questions such as, 'Why is it beating so fast?' 'Is that good?' 'Why?' Several students were asking for drinks of water. The physical education teacher had instructed the students to jog with their peer mentor to the water fountain in pairs.

Next, the teacher asked for several student pairs to demonstrate the fitness stations for the day. The stations were: yoga – partner, squat cone flip, hula hoop jump, carpet squares, hurdles, lunges, plank pass, balance pass, and hula hoop jump ropes. The
students participated at each station with a partner while the teacher and teaching assistants circulated the gymnasium providing feedback to the students. After students used all stations, the physical education teacher closed the lesson with students sitting in the black circle. The teacher spoke about muscles being used during the stations and student responses indicated understanding of the lesson and links to learning targets.

**Observation session four.** The fourth observation was conducted in a segregated adaptive physical education class. The class consisted of nine students with severe cognitive disabilities, one physical education teacher, two teaching assistants and one individual teaching aide. The physical education teacher welcomed his class and they sat in the middle of the gymnasium in the marked circle. The teacher explained the warm-up and immediately instructed the students to jog around the gymnasium. The teacher and adults jogged around the perimeter of the gymnasium with the students. One student became non-compliant. The student began running through the middle of the gymnasium. When provided with verbal correction, the student dropped to the floor. As the adults attempted to intervene, the student’s behavior escalated. After three minutes, the building principal was called to assist with the non-compliant behavior. While this was occurring two additional students displayed non-compliant behavior by laying on the floor, crying, and kicking the wall. The teacher had previously stated that the jog around the gymnasium was intended to be a warmup lasting three minutes in duration for the purpose of elevating heart rates. The observer identified the warm up to last 7 minutes as student behavior interfered with the instruction.

After the jog, they physical education teacher instructed students in a stretching exercise to prepare for the day's activities. After the warm-up, the students formed a line
and received a water break. After breaking for water, the students once again sat in the center of the gymnasium. The teacher explained the stations and used several students to demonstrate. Stations were: yoga, pyramid cup stacking, hurdles, lunges, plank pass, and jumping jacks. While performing the activities, the adults provided direct instruction and feedback to all of the students. With six stations, many of the students were working independently at the stations. After performing all stations, students sat in the center circle where the teacher provided a mindfulness activity. The students then were instructed to line up at the door of the gymnasium. On the way to the line, the teacher praised each student and gave them a high five. The classroom teacher arrived and the students departed the gymnasium.

**Semi-Structured Interviews**

This study was designed to understand in which adaptive physical education environment students make the most physical and social growth. In the interviews, eight educators were interviewed to better understand the social and physical growth of students in both environments. The participants were selected using purposeful sampling; all participants were familiar with the adaptive physical education program in the elementary school and the students participating in the program. Eleven educators were sent emails requesting their participation in the study. Eight responded indicating that they would participate. Table 5 outlines the interview participants’ information.
Table 5

Semi-structured Interview Participant Information

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Role</th>
<th>Gender</th>
<th>Years’ Experience</th>
</tr>
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<tbody>
<tr>
<td>Educator A</td>
<td>Athletic Director</td>
<td>Male</td>
<td>19 years</td>
</tr>
<tr>
<td>Educator B</td>
<td>Occupational Therapist</td>
<td>Female</td>
<td>18 years</td>
</tr>
<tr>
<td>Educator C</td>
<td>Psychologist</td>
<td>Female</td>
<td>16 years</td>
</tr>
<tr>
<td>Educator D</td>
<td>Principal</td>
<td>Male</td>
<td>20 years</td>
</tr>
<tr>
<td>Educator E</td>
<td>Physical Education Teacher</td>
<td>Female</td>
<td>5 years</td>
</tr>
<tr>
<td>Educator F</td>
<td>Physical Education Teacher</td>
<td>Female</td>
<td>8 years</td>
</tr>
<tr>
<td>Educator G</td>
<td>Physical Education Teacher</td>
<td>Male</td>
<td>2 years</td>
</tr>
<tr>
<td>Educator H</td>
<td>Special Education Teacher</td>
<td>Female</td>
<td>12 years</td>
</tr>
</tbody>
</table>

The researcher contacted potential participants by email, with a follow-up email that provided each participant a consent form (Appendix C). The participant’s returned the consent form indicating their permission to participate in the research study, and the interview appointment was scheduled. The interviewees were met with individually and asked to respond to the semi-structured interview questions (Appendix D).

The interviews resulted in interviewees’ explanatory narratives of their experiences in working with students with severe disabilities in both adaptive physical education environments. The researcher used a one-on-one interview approach, in which the researcher asked the interviewee a specific question and recorded the answer from only one individual at a time. According to Creswell (2012), “One-on-one interviews are ideal for interviews participants who are not hesitant to speak, who are articulate, and who can share ideas comfortably,” (p. 218). Interviews were conducted in quiet, small offices within the confines of the elementary school in which the adaptive physical education classes were taught. During the semi-structured interviews, the researcher
audiotaped the questions and responses utilizing the application Rev to record all interviews while taking hand-scribed notes.

Data analysis was conducted instantly following each interview as the researcher reviewed and then coded the transcription for the later purpose of pattern detection, categorization, and theory building (Saldana, 2016). Immediately following the interview, the researcher completed the first cycle of coding while categorizing codewords and their descriptions. This process assisted in establishing codes into nodes and subcategories (Saldana, 2016). This information was uploaded into NVivo where nodes were established. The researcher coded each question individually. The second cycle used NVivo coding to authenticate the interviewees’ language and perspectives (Saldana, 2016). The codes were then grouped into themes which related to the phenomenon of this case study. In reviewing the data collected for the emerging themes, a word frequency query was generated from the data imported into NVivo from the semi-structure interview participants’ responses. The result is illustrated in Figure 5. The following sections describe these emerging themes in detail.
Emerging theme: Peer mentors. Each participant shared their insights on their attitude of the adaptive physical education class with peer mentors. The participants shared similar sentiments, at times having overlapping statements. Throughout the entire semi-structured interview process, positive attributes associated with peer mentors were referenced on twenty one occasions. Educator A revealed, “My opinion is that I believe that the peer mentors in physical education is a positive program for our adaptive phys ed students.” He communicated that, “I believe that the peer mentors would improve the learning of any student. I don't believe that that would be a distraction. I think it would be a positive for all.” Educator B, an occupational therapist, stated,

I think that adaptive PE with peer mentors is a positive way for the adaptive PE students to learn from and get a good model from their peer mentors. I think that
oftentimes, specifically students with behaviors respond better to a peer mentor than they do to an adult or a teacher instructing them.

Educator C noted positive sentiments as well; she revealed, “I think it's fantastic. I think it allows same age peers as positive role models to help students in maybe areas, their weakness, in a positive way. I think it also helps them with communication with each other.” When Educator D, was asked his opinion on peer mentors, he believed it best to provide an example to exemplify the effects of what he has observed when peer mentors work with students that have severe cognitive disabilities. He stated,

So to me, to the untrained eye, if I'd walked in, I wouldn't even necessarily know who was a general ed student and who was a special ed student. Because in one particular example, one student was showing the other how to putt on the green. Yeah, I walked over and saw it, I saw it was one of our special ed kids, working with one of our gen ed fifth grade students. The special ed kid hit the ball down the green and then got a little silly because she had a good shot close to the hole and she kind of lifted the club up a little bit, not in an aggressive way, but just excited, and the other child (the peer mentor) kind of calmed the student down, brought her over to the next hole. She's a student (the special ed. student) who's sometimes going to have difficulties during transitions. We've seen her have some behaviors. So to see a fifth grade child working with her and making the connection, you could just see that they were enjoying each other's company. In that moment when the special education student displayed some atypical behavior and the other child was not phased and continued to work with that child, didn't need to seek out the guidance of an adult because there was some familiarity and relationships developed I knew that the peer mentor PE program was successful.

Educator E, a physical education teacher, shared, “I think having adaptive phys-ed with peer mentors is a great thing for the students.” She continued,

It allows the kids socially to form a bond, and once they form that bond and they have a good rapport, they're able to give feedback to their classmates. And I feel that kids take feedback better from students that are around their age level.

Educator E specifically mentioned, “So I think socially it's great, and it would even challenge them and motivate them physically to work better.” Educator F, revealed, “I think that the students really benefit from the peer model, whether it's one-to-one or just
integration as a whole.” When further question in regards to the benefits the adaptive physical education students receive, Educator F added, “I think the APE students see what the appropriate behaviors are and whether it’s motor skills or the objectives of a game.” They continued, “They see the general education students doing it and for the most part, do those things that they're observing the typical students doing.” Educator G, echoed the opinions of his colleagues by stating, “I think it's very beneficial for the adaptive students.” He also noted that the students with disabilities use the general education students for models or as examples. He recognized that the student with disabilities get “Feedback from someone they can feel comfortable with, and it allows them to form relationships with students that they may look up to throughout the other areas of school.” Lastly, the special education teacher, Educator H, divulged, “My opinion is that I have seen enormous growth in my students’ social abilities with peer mentors.” The special education teacher shared that at first they were skeptical and believed that the students in her the class needed a smaller class to thrive. She acknowledged knowing the students for several years and surprisingly she reported, “I have seen them grow in ways I never thought possible. I have seen a great deal of change in them socially, physically, academically, and with their confidence.”

Overall, the attitudes shared regarding peer mentors in adaptive physical education class for students with severe cognitive disabilities was positive. Interviewees identified benefits in physical abilities and social aspects. Several participants spoke of relationships that were formed that carried over into other areas of the school day.

**Emerging theme: Segregated adaptive physical education.** The participants were questioned regarding their opinion of the segregated adaptive physical education
class. The responses revealed some disparity within beliefs. Educator A revealed, “I don't know if I saw growth or rationale in a sense where the PE skills were different, and I didn't relate the two.” When probed, he responded, “Both groups (adaptive PE environments) are still working on the same skills. But the social and emotional growth and the social piece of the peer mentors program, I think, far outweighs the segregated approach.” Educator C and E had similar responses to Educator A, indicating that the benefits of peer mentors offset the segregated approach. Educator C stated, “I don't think they're as effective. I think the teachers do a wonderful job, but I don't think they're as effective as having peer role models, showing them what to do and how to behave.” Educator E shared,

I think having it segregated, it doesn't allow for exactly what it is, peer mentor. So like someone to look up to and a role model in another class, behaviors. And I really just think the social aspect is great because the kids are in their own classroom all day, so it's great when they come to a special area and they're able to interact with another class. And then that translates through the school day, in the hallways, in the cafeteria, in the class. There are more behaviors in a segregated class, you're mimicking behaviors of someone else in your class, but then when you bring in the general education population, they're motivated to work with someone in the gen-ed class, and they do have a much better job.

However, Educators B, F, and G suggested that segregated adaptive physical education is appropriate for some students. They believed that some students require a smaller setting based on the individual needs of each student or the makeup of the class. Educator B stated, “I think there's a place for a segregated adaptive PE class. We have more students coming in with a lot more medical issues and concerns, equipment, wheelchairs, and behaviors.” She added, “Sometimes, those students may not be appropriately placed with a peer mentor for safety reasons.” She added that she would have concerns that the student may need more intense support and could only learn from
an adult. Educator F, had similar concerns as Educator B. She believed that age can at times be a factor for student integration, she stated, “I think there is something to be said for segregating the younger kids.” When prompted as to what age level she thought was appropriate, she replied, “I definitely think the grade three through five APE classes benefit from coming with the general education students but I think there is a place for segregation.” She also added that students who are younger and nonverbal may need to be segregated. She stated, “In our two 6:1:3’s, all the students are nonverbal so I don't even know if they have the ability to follow what a mentor is doing.” When the teacher was asked whether she thought older nonverbal students could follow a mentor, she did not have a response. Educator G also believed that integration or segregation depends on the individual student. Educator G stated, “I think that some of the lower-functioning students, it does help because it allows them to have a little more of a calm environment.” When I prompted Educator G in regards to higher functioning students, the response was,

When the students are higher functioning, I think that having the peer mentors around them is good. It makes them feel more social and allows them to make those connections that they should be making and not be held back.

I then asked how that differed from lower functioning students, she stated, “With the lower-functioning kids, not that the social aspect is not important, I think sometimes they get way too overwhelmed and sometimes it can actually cause them to be a little bit frustrated or just overwhelmed in general.”

Educator D and H shared the ideology that students should be included whenever possible; however, individual students’ needs always need to be considered. When questioned about their beliefs regarding segregated adaptive physical education, Educator D reported, “I think there is a time and a place. Our goal should always be to include
students whenever possible.” When the researcher asked about when inclusion would not be feasible, educator D stated, “If safety is a concern, we need to consider if inclusion is the best solution. Perhaps, we look at integration for only a portion of a period, or towards the end of the year.” Similarly, Educator H identified, “I think the word segregated obviously doesn't have a positive connotation, but I think that you need to look at the individual students and what their physical needs are and how you can best integrate them individually.” When the researcher prompted the interviewee to expand on their thoughts on segregation, they stated, “Ultimately what I think of segregation is that it should end with the goal of integration. And I think you've got to find the strengths of the kids in that class and the teachers to make that happen.” Educator H added, “Integration for one student may look very different than another, you have kids with more needs you find ways to integrate them over time.” Fundamentally, Educator D and H had commonality in their thoughts that integration is the goal for all students.

Overall, the thoughts on segregated adaptive physical education varied among interview participants. Some educators shared sentiments in which they believe the benefits of peer mentors far outweigh a segregated adaptive physical education class. Others believed that each individual child or class makeup needed to be evaluated before determining if peer mentors would be appropriate. Two educators provided reflections indicating that integration should always be the goal and educators should find ways to accommodate integration over time for each student to receive the benefits of being educated with typically developing peers.

**Emerging theme: Social relationships.** Data collected from the semi-structured interviews indicated that students in the peer mentor adaptive physical education classes
had an increase in social relationships as a result of the environment. All eight educators
noted social connections to the two environments. When speaking of the peer mentor
environment the educators reported the following:

In the peer mentor group, they were incredible. I was able to witness and observe
both groups, and I saw the social emotional learning with the peer mentor group,
like I mentioned before. I saw team building. I saw teamwork. I saw cooperation
and communication. I saw an interaction between kids that may never have been
able to communicate like that prior. It gave the adaptive students a sense of self-
worth, I believe, and was very much, in my observations, a positive.

There are really great relationships made, and a lot of them were made without
adult interaction. It was like we just presented the kids with the peer mentors and
then once they started to interact with the students in adaptive PE, there were
relationships made that may not have otherwise been made because they're not
given that time and opportunity. Because even when students are included
together in lunch, they tend to still sit with their cla-
class, where this is a way for
them to be together and develop a relationship that's not necessarily forced, but
they just are given the environment to do it.

In the peer mentor group, the social relationships were tremendous from the
beginning, just introducing yourself, what's your name? And after a week or so,
the kids really got comfortable with one another. And it was great for the gen-ed
kids too because some of them were shy. And I even noticed in the cafeteria they
would talk to each other, or in the hallway they got excited when they came to
visit together. So socially it was awesome, and it just allowed beyond the
feedback that they gave about form on a specific sports topic or fitness unit. It was
just nice to see them talking and coming out of their shells a little bit.

In the adaptive settings where there are the peer role models, I see the students
who have different abilities step it up, and they tend to do better having those role
models rather than not having these role models in place.
I've walked into a situation where the peer mentors are helping with a behavior, I
think it depends on the activity. The kids are high fiving each other in the hall
smiling at each other. The parents are happy on both sides, new friendships are
forming.

We had some of the fourth grade APE students, the group with the peer mentors
were being invited to a general education student's birthday parties. We really saw
some relationships form, which is nice because now those fourth graders are fifth
graders and they are coming with the fifth grade gen ed classes so the integration
is kind of happening organically now. They're integrated with everyone and
having those relationships. I mean, we have one special education student who
doesn't want to work with anyone in his adaptive class. He wants to work with the
gen ed. kids and the gen ed. kids want to work with him. So it's really nice to see that those relationships have formed.

They (the students with severe cognitive disabilities) love the peer mentors. Like I said, they look up these kids. A lot of these kids that were chosen as peer mentors are just excellent kids. They excel at phys ed. and are just all around great kids and these adaptive students know that and they get to work with them and build this relationship that they otherwise probably wouldn't really get to have.

This is perhaps this area where I have seen the biggest difference in my students from years past. My students are interacting with students from other classes. They are seeking students out on the playground. They are being invited to birthday parties. I have two children participating in orchestra this year, which I believe this program has given them the confidence to try new things with general education students. In the lunch room they are seeking general education peers and having conversations. I think having appropriate social models has been invaluable for all of my students.

In evaluating this information, common themes that emerged were that students with severe cognitive disabilities had appropriate social models which impacted their behavior, motivation, and class participation. Additionally, several educators spoke of relationships carrying over outside of the physical education classes in which students would seek each other out in other academic settings. All educators reported social growth or relationships developing for students that had participated in the peer mentor adaptive physical education class. Additionally, educators reported that students with disabilities were invited to a peer mentor’s birthday party.

During the semi-structured interviews, some of the participants provided a comparison of the social differences noted in the two environments, the adaptive physical education class with peer mentors and the segregated adaptive physical education class. For the educators that shared their thoughts on the social aspect within the segregated physical education class, the responses yielded similar results. Educator A stated, “In the segregated group, the only social relationships that I could see were between the adaptive
phys ed students and the teacher and the aides, which all have very good relationships.”

Educator E stated, “In the adaptive segregated class, the kids would go to an adult first as opposed to going to their classmates.” Educator F reported,

   In the segregated class they are segregated in all special areas so I think that's really tough. There is definitely not as much of the social aspect and some of our APE students are nonverbal and they're not socializing with anyone. The socialization is really more peer to adult.

Educator G reported,

   In the segregated class I think that the social interactions differ day by day in that class, specifically. There were certain students that would have a tough day and it was set the other students off and before you knew it you'd have the whole class having tantrums and not really being able to control themselves and it would be just a lot for them. As soon as one student would have that setback, the other students would kind of feel like something was wrong and then it was upset them and it would cause the whole class to be tough overall. So one student will sometimes trigger another.

The four educators that shared their perceptions on the social relationships within the segregated adaptive physical education settings all indicated that the students interacted with adults rather than children. One educator, indicated, that the children are not “socializing with anyone.” This is a stark difference from the educators indicating that the students with severe cognitive disabilities interact consistently with the peer mentors in the inclusive adaptive physical education setting. Additionally, in coding the responses, this researcher noted the interviewees mentioned student behavior more frequently as a negative social aspect in the segregated adaptive physical education class.

**Emerging theme: Physical abilities.** In an effort to ascertain the educators’ perceptions about the physical abilities of students, this researcher questioned the participants in regards to the growth of students’ physical abilities in both environments. The majority of participants were unable to provide any information about noticeable
difference relating to the two groups. The physical education teachers provided the most insight to students’ physical growth. Educator E noticed a higher level of physical participation from the students in the peer mentor group, which she attributed to motivation. She stated,

The general education students were able to motivate the students physically and help them with form and give them feedback. And I mean the general education kids, there were times you where they were working more on giving feedback, as opposed to doing this specific skill. But I think that's still important, they were giving the feedback and helping the other students.

Educator G, a physical education teacher believed that both groups had physical gains. In speaking of the students in the segregated physical education environment he believed they made physical growth as they had an opportunity to work in “small groups and really focus, give one-on-one attention throughout the class.” Educator F stated, “I think the students that participate in the peer mentor program definitely had more physical growth than the other APE classes.” The perceptions of the physical education staff reflected the quantitative data collected which demonstrated a statistical significance in physical growth for the students in the peer mentor physical education environment. Overall, growth in physical abilities was noted, with the students in the peer mentor group showing a higher level of growth.

The non-participant observations provided this researcher with information regarding the physical abilities of the students participating in both environments. In the adaptive physical education environment with the peer mentors, there was a higher level of student participation, as the peers were frequently motivating one another and providing constant and direct feedback to the students with severe cognitive disabilities.
The students with disabilities were more eager to comply with directives when presented with directives from peers than that of the adults.

**Emerging themes: Negatives.** In an effort to fully evaluate the impact of the peer mentor adaptive physical education environment, participants were asked to identify not only positive aspects of the environment but negative aspects as well. The majority of the participants agreed that there were few negatives if any at all. Some of the participants boldly specified that there were no negative in the peer mentor adaptive physical education classes. Educator A, the Athletic Director for the school district stated, “As far as negative impacts of the peer mentors, I didn't see any. I didn't see any negative impacts.” Educator F, a physical educator teacher concurred, stating, “With the peer mentor group there really were no negatives.” Educator H, a special education teacher, stated, “I don’t know if there is a negative impact to the peer mentor group. From my advantage point I have not observed one.”

Three of the interviewees identified minimal negative associations with the peer mentor physical education class. Educator E, a physical education teacher, recognized the impact on the general education students within the peer mentor model of adaptive physical education:

The only negatives, depended on the student that was picked, if they were taken out of their normal routine and phys-ed. But within a couple of weeks, they really all went in. I mean, some of them went into it with like, "I'm not sure." But after a couple of weeks, they all had an open mind. When we did that meeting and we were able to get feedback from the students, it was really nice to see that they were excited to help and meet new kids and work together.

As Educator E mentioned, some of the general education students were reluctant to be removed from their typical physical education class and paired with students that had severe cognitive disabilities. Ultimately, after several weeks, the students established
routine and this was no longer an issue. Educator B, the occupational therapist, recognized the grouping of students a possible barrier or negative:

The negative impacts, I would say when we talk about the different levels, first of all, you have to find the right peer mentors. Sometimes a kid that you think is a good peer mentor may not be right for that. You have to group the peer mentor with the child in the adapted PE class appropriately. Some are more motivated by others, whether it be a boy-boy grouping or a girl-girl grouping.

The physical education teachers report that, at times, they did switch peer mentors as other students had a better relationship with other peers. Certain students with disabilities formed a better bond or partnership with others. However, the physical education teachers did not identify this as a negative aspect. In reflection, they identified this as grouping of students, no differently than they would do in any other section of physical education. Lastly, Educator D, the principal, discussed safety concerns for the students with severe cognitive abilities:

I wouldn’t say it's a negative impact, but some of the conversations, the safety concerns regarding, especially Russell has some balance issues. So how do you do this? I had a conversation with the phys ed teachers and the general ed teacher and said, “Well, you have to utilize the adults to make a plan and take it slowly.” If the child needs to have their own space, you can expand and contract the bubble that a child may need if they're having balancing issues. Safety's got to be number one. So I wouldn't say it was a negative, but it was a conversation of practicality.

The use of peer mentors has forced educators to evaluate the positive and negative impacts of students in different adaptive physical education environments. Utilization of peer mentors in the adaptive physical education class has caused educators to make modification for students that they may not have made otherwise, additional safety and social concerns had to be considered, but were managed. Overall, perspectives on negatives of peer mentors varied, with some educators identifying none at all to some identifying very few.
This researcher identified an increase in negative behaviors in the segregated adaptive physical education classes. During both non-participant observations, non-compliant behavior was observed that required assistance from additional staff members. On one occasion the building principal was called for assistance and on another occasion the building psychologist. During the peer mentor physical education adaptive physical education classes, the researcher observed peer mentors intervening with non-compliant behavior without the support of adults.

Summary

The results provided in this chapter were both quantitative and qualitative in order to determine the growth of physical and social performance of students with severe disabilities in both inclusive physical education and segregated adaptive physical education using a mixed methods exploratory case study. More specifically, answering the following research questions:

Research question one. To what extent do peer mentors impact gross motor skills performance of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class.

Research question two. To what extent do peer mentors impact social skills of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class, based on the perceptions of the educators involved in the physical education program.
The information provided throughout chapter four has combined both quantitative and qualitative methods in order to provide a broader perspective to the specific research questions and answer the overarching research question and inquiry on which this study was based. The all-encompassing research was to determine which of these environments had the greatest positive impact on student achievement.
CHAPTER 5

Discussion

Introduction

The purpose of this chapter is to serve as a concluding analysis from the previous chapter and discuss how the findings inform the original research questions. This chapter will conclude with suggestions and implications for future analyses based on the information gleaned from the results of this study.

Interpretation of Results

The purpose of this study was to evaluate students’ physical and social progress in both inclusive and segregated physical education environments. This researcher investigated the physical and social performance of students with severe disabilities in both inclusive physical education and segregated adaptive physical education, based upon standardized testing and teachers’ perceptions.

The first research question this research sought to answer was: To what extent do peer mentors impact gross motor skills performance of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class?

The results yielded from the statistical data indicated that there was a higher mean gross motor quotient for the students in the peer mentor adaptive physical education. Although both groups made growth, there was a statistical significance on the post test for the students in the peer mentor adaptive physical education. Overall, the students in the peer mentor adaptive physical education class made greater gains in their gross motor
skills when compared to those in the segregated adaptive physical education class. A probable reason for the increase in students’ gross motor skills is that students working with peer mentors had a higher rate of reinforcement throughout the adaptive physical education class period. The peer mentors served as not only classmates, but as instructors to model the activity properly and to provide feedback to the students with severe cognitive disabilities.

The second research question posed was: To what extent do peer mentors impact social skills of students with severe cognitive disabilities (intelligence quotient below 70) in an adaptive physical education class compared to students in a segregated adaptive physical education class, based on the perceptions of the educators involved in the physical education program?

In using semi structured interviews and non-participant observations, the researcher was able to ascertain the qualitative results to answer the second research question. This study also reveals that there exists a positive impact on social relationships and abilities when students are educated alongside peer mentors. A plausible reason for this finding is that the students with the severe cognitive disabilities were given an opportunity to socialize with typically developing peers, and the students in the segregated environment were not. Additionally, in the environment in which the students were segregated, the natural interactions that occurred were between students and adults. In the environment in which the peer mentors were present, natural interactions took place between students. The increased frequency of student-to-student interactions may have enabled increased social abilities and relationships to form in the adaptive physical education class with peer mentors.
The overarching question and inquiry on which this study was based was to determine which of these environments had the greatest positive impact on student achievement. The quantitative results from the TGMD-2 indicated that the students in the adaptive physical education class with peer mentors (M=71.24, SD=.998) yielded higher post test scores than those students in the segregated adaptive physical education class (M=63.284, SD=.998). Additionally, the results for the two-way ANOVA indicated a significant effect for the adaptive physical education environment F(1,36) = 32.97, p<0.00. The information gathered from the non-participant observations suggests that student non-compliant behavior was higher in the segregated adaptive physical education environment. Further, peer-to-peer interactions were only observed unprompted in the adaptive physical education environment with peer mentors. The information garnered from the semi-structured interviews was favorable towards the adaptive physical education environment with peer mentors. Overall, the attitudes shared regarding peer mentors in adaptive physical education class for students with severe cognitive disabilities was positive. Interviewees acknowledged benefits of peer mentors regarding physical abilities and social aspects for students with severe cognitive disabilities. Several participants spoke of relationships that were formed that carried over into other areas of the school day for the students in the peer mentor environment. After triangulating the data and evaluating the information, the overall environment that had the greatest overall positive impact on student achievement was the adaptive physical education environment with the peer mentors.

The theoretical framework in which this research was based was that of Urie Bronfenbrenner (2005), who coined the Ecological Systems Theory. The Ecological
Systems Theory evaluates how the intrinsic qualities of children and their environments interact to influence how they grow and develop (Bronfenbrenner, 2005). More specifically, this researcher used the Ecological Systems Theory to evaluate the impact the microsystem, the most immediate environment, had on the students' overall performance based upon the adaptive physical education environment in which the student was educated. The study reveals that there is a correlation between the adaptive physical education environments in which children are educated. The environment in which students are educated will shape their social and physical development and progress.

The conceptual framework of this research was previously outlined in chapter two. The framework was based on evaluating the two Adaptive Physical Education approaches utilizing a control group of segregated students and a treatment group of students receiving physical education with peer mentors. The researcher evaluated the impact that the two environments had on students' social abilities and gross motor (physical) abilities. The results of the study revealed that the students in the environment in which peer mentors were present had greater social and physical growth.

**Relationship Between Results and Prior Research**

Evidence suggests that students in the peer mentor adaptive physical education group have greater growth in gross motor abilities and social abilities than those who receive adaptive physical education in a segregated environment. In the study completed by Klavina and Block (2008), the researchers assessed the effect of peer tutoring on the variables of physical and social interaction and instructional behaviors on students with severe and multiple disabilities at the elementary level. During the peer mediated and
voluntary peer support environments the instructional and physical interactions between students with disabilities and their typical peers increased.

The research conducted by Fitch (2003) evaluated the perceptions of teachers, parents, and administrators regarding inclusive and segregated classrooms on the social impact of students. Although the research concluded by Fitch did not specifically look at physical education classrooms, he evaluated the perceptions of stakeholders in the inclusive and segregated academic classrooms. Overall, his research indicated the students’ perceptions appeared to adjust based on their circumstances. Changes in the school environment overall have a profound impact on students’ lives. Fitch’s research only skims on teacher perceptions and ideologies. However, it suggests that the ideology that the teacher brings to the environment has the greatest impact. The present study exemplified the difference an environment can have on student growth both physically and socially.

In a 2005 study conducted by Ninot, Bilard, and Delignieres, the researchers evaluated the effects of an athletic program (integrated or segregated) on the athletic domain of perceived competence and general self-worth. Overall, the results indicated that all four groups did not have a significant change in their self-worth. The integrated swimming group had a significantly lower perceived athletic competence; however, the greatest increase in athletic performance. Ninot, Bilard, and Delignieres, (2005) assessed the effects of an athletic program (integrated or segregated) on the athletic domain of perceived competence and general self-worth. Similarly to the present study, the group of athletes in the integrated program made the greatest increase in athletic performance or gross motor gains.
The study completed by Simpson and Mandich (2012) suggested that including students in physical education is possible if teachers have access to appropriate supports. These supports include providing necessary staffing to support teachers in PE. For example, providing opportunities for educational assistants to attend PE with students and having appointed specialist and physical education teacher provide consultation. The peer mentor adaptive physical education program allows for stations with proper supports for special education students.

The results yielded from the statistical data indicated that there was a higher mean gross motor quotient for the students in the peer mentor adaptive physical education. Although both groups made growth there was a statistical significance on the post test for the students in the peer mentor adaptive physical education. Overall, the students in the peer mentor adapted physical education class made greater gains in their gross motor skills when compared to those in the segregated adapted physical education class.

The data collected from the interviews was first coded using descriptive coding in which the researcher kept a codebook of codewords and their descriptions. The second cycle used NVivo coding to authenticate the interviewee’s language and perspectives (Saldana, 2016). The codes were then grouped into themes which related to the phenomenon of this case study. Lastly, the data was triangulated with the non-participant observations.

In a qualitative systematic review, Coates and Vickerman (2008) inspected special education students’ experiences in physical education. The purpose was to identify, appraise, select, and synthesize relevant research evidence from within the ten years preceding the article publication. Based upon the literature review conducted by
Coates and Vickerman (2008), the findings indicated that children with special needs enjoy PE when fully integrated. Their analysis determined that students with special needs advance physically and socially in addition to gaining enjoyment and learning while taking part in inclusive integrated sporting activities. According to Coates and Vickerman, special education students that were included in physical education with typically developing peers were encouraged to have social and physical inclusion. The findings in the analysis concluded by Coates and Vickerman are in direct alignment with the finding of the present study. For the students in the adaptive physical education environment with peer mentors there was a significant effect of the adaptive physical education environment on the TGMD-2 post-test results, at the \( p < .05 \) level.

**Limitations of the Study**

There are several limitations within this study. First, the study was conducted within a single school. The sample size was small (thirty-eight is not very robust) and given a larger sample size the outcome might have been more robust. Additionally, in only using one school as a part of this study, only one age group was evaluated.

Secondly, the study lacked a measure to assess adherence to the curriculum. The students in the adaptive physical education classes were instructed by three different physical education teachers. Teachers were given flexibility in the implementation of the curriculum and not required to submit lesson plans for either group of students. There may have been variability in the way the post-test was implemented. Additionally, with three different adaptive physical education teachers, their experienced and years of teaching varied.
Recommendations for future research include evaluating students in other areas in order to assess growth in multiple dimensions.

**Implications for Future Research**

The following recommendations are based on the results of this study in conjunction with the literature review.

1. Repeat the study, evaluating additional areas of student growth.

The current study evaluated gross motor and social abilities of students. The rationale for expanding the areas in which the students are assessed is to evaluate all areas of development. When developing an student's IEP, a Committee on Special Education, must consider the students present levels of performance in the areas of academic achievement, functional performance, and learning; social development; physical development; and management needs.

2. Conduct a comparison study utilizing students across multiple grade levels.

In evaluating students in multiple grade levels, difference in students’ gross motor and social abilities could be evaluated in different age ranges when working alongside peer mentors. In conducting this comparison study, the results would be valuable to determine if age or grade level are factors in the impact of peer mentors on students with severe cognitive disabilities in adaptive physical education class.

3. Conduct a study in which peer mentors are utilized in subjects other than physical education.
The current study evaluated the impact of peer mentors in adaptive physical education class. The theoretical framework on which this study is based proposes that the microsystem, smallest and direct environment in which children live has the greatest impact on a child’s development. This environment includes a child’s home, school or daycare, peer group, and/or community environment. Children interact within this category by the personal relationships they encounter with family members, classmates, teachers, and/or caregivers. The rationale for increasing the study to include peer mentors in other subject areas aside from physical education is to determine if peer mentors have a value in physical and social growth of students with severe cognitive disabilities across all environments.

**Implications for Future Practice**

The purpose of this study was to assess students’ physical and social progress in both inclusive and segregated adaptive physical education environments. The findings of this study suggest that students have increased gross motor skills and social skills when educated with peer mentors in adaptive physical education classes. Ultimately, the use of peer mentors should be evaluated in many different environments.

The Individuals with Disabilities Education Improvement Act (IDEIA) (2004), formerly the Education of the Handicapped Act (1975), mandated that all students with disabilities are to be educated in the least restrictive environment. The least restrictive environment may range from a general education classroom to a residential based academic environment depending on the individual needs of each student.

Committee on Special Education (CSE) teams must make recommendations to meet the needs of students in the least restrictive environment. The Committee on Special
Education must evaluate the academic, physical, social, and management needs of each individual student. This study provides empirical evidence that students have social and physical growth when educated alongside typical developing peers, or peer mentors. CSE teams should use this information to make appropriate program recommendations to support social and physical growth for students with severe disabilities.

Additionally, the findings from this study suggest student success with physical and social growth in physical education when students are paired with peer mentors. In providing students an opportunity to participate in adaptive physical education class with peer mentors, educators are increasing students’ own skill sets. This research supports the ideology of inclusive athletics for students with severe cognitive disabilities. It is recommended that stakeholders involved in creating athletics for children with disabilities consider the effectiveness of an inclusive environment.

**Conclusion**

In summary, the present study demonstrated that students with severe cognitive disabilities make greater social and physical growth when educated alongside peer mentors. The adaptive physical education environment with peer mentors had the greatest overall positive impact on student achievement.

When students have an opportunity to be educated alongside typically developing peers they are given an opportunity to develop relationships with students that do not have disabilities. Students with severe cognitive disabilities can improve on invaluable skills when educated alongside general educated students. In the present research study, the environment with the peer mentors in adaptive physical education had the overall greatest impact on students with severe cognitive disabilities, such as the impact of
forming some new relationships or an invitation to a general education peer’s birthday party, an experience they never had before. Students with disabilities were reported to carryover these relationships into the hallway, recess, the cafeteria and other areas of the school building.

The qualitative information provided in both the non-participant observations and semi-structured interviews provided critical information in determining the overall impact on which environment had the greatest positive impact on students. It is clear that non-desired behaviors were observed less frequently in the peer mentor adaptive physical education environment. The non-participant observations and semi-structured observations illuminated this information throughout the research. Additional research may be needed to determine if peer mentors decrease disruptive or non-desired behaviors in students with severe cognitive disabilities in settings other than physical education.

This researcher has concluded that the utmost authentic approach to educating students with severe cognitive disabilities in adaptive physical education is alongside peer mentors. Additional research is needed to verify this finding, using a larger sample range of students’ ages/grade levels. When determining specialized programing for students with disabilities, the option of peer mentoring should be considered, as this study revealed student growth in the areas of physical and social abilities.

Epilogue

As I, the researcher, reflect upon the results of the current study, my thoughts turn to a statement from Judge Geary in the case of Oberti v. Board of Education 1992: “Inclusion is a right, not a privilege for a select few.” It is important to keep this in mind when making recommendations for students to be integrated among their typically
developing peers. Too often there are excuses made as to why students cannot be integrated with their non-disabled peers. We need to make this a priority for students to develop and grow. The current research has demonstrated that an integrated environment fosters a positive impact on the lives of severely disabled students. As educators we need to carefully plan for the success of these students and allow for integrated opportunities, in order to increase the growth and development of students with severe cognitive impairments.

My hope is that teachers, administrators and parents reading this research will advocate for inclusion for students with severe disabilities. It is my intent to empower all stakeholders to create a culture of inclusion in education so that all students can cultivate relationships in the school environment. All children, general education or special education, can learn from one another. This researcher is optimistic that all stakeholders will continue to reflect on the research presented in this study as the choices they make in creating inclusive environments for students greatly impact their growth in multiple areas.
REFERENCES


Individuals with Disabilities Act of 1990, Public Law 101-476 (United States Supreme Court 1401. 2004).


Part 200 - Students with Disabilities (NYS Education Department Regulations of the Commissioner October 2016).


Notes Headquarters: https://www.psychologynoteshq.com/bronfenbrenner-ecological-theory/


APPENDIX A

IRB Approval Memo

IRB #: IRB-FY2020-254

Title: The Impact of Peer Mentors in Physical Education On Students with Severe Cognitive Disabilities

Creation Date: 10-21-2019

End Date: 1-22-2021

Status: Approved

Principal Investigator: Jessica Lukas

Review Board: St John's University Institutional Review Board
APPENDIX B

Additional Figures and Documents

Table B 1

Zscore (pretest)

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<td>1</td>
<td>36</td>
<td>.004</td>
</tr>
</tbody>
</table>
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + Treatment

Table B 9

Estimates

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>Std. Error</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregated Adaptive</td>
<td>63.284</td>
<td>.998</td>
<td>61.258 - 65.310</td>
</tr>
<tr>
<td>Peer Mentor Adaptive</td>
<td>71.242</td>
<td>.998</td>
<td>69.216 - 73.269</td>
</tr>
</tbody>
</table>

a. Covariates appearing in the model are evaluated at the following values: Pretest = 60.45.

Table B 10

Univariate Tests

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrast</td>
<td>470.308</td>
<td>1</td>
<td>470.308</td>
<td>28.321</td>
</tr>
<tr>
<td>Error</td>
<td>581.227</td>
<td>35</td>
<td>16.606</td>
<td></td>
</tr>
</tbody>
</table>

The F tests the effect of Treatment. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.
Dear Prospective Participant,

You have been invited to take part in a research study to learn more about the impact of peer mentors in physical education on students with severe cognitive disabilities. The purpose of this study is to evaluate students’ physical and social progress in both inclusive and segregated physical education environments. This study will be conducted by Jessica Lukas, Administrative and Instructional Leadership of the School of Education St. John’s University. As part of her doctoral dissertation, Jessica Lukas will be conducting her research. Her faculty sponsor is Dr. Anthony Annunizato, Professor in the Department of Administrative and Instructional Leadership.

If you agree to be in this study, you will be asked to take part in a semi-structured interview concerning questions related to adaptive physical education. The interviews will be audiotaped. You may review the tape and request that all or any portion of the recording be destroyed. Participation in this study will involve approximately a thirty-minute interview. The interview will be held in person. There are no known risks associated with your participation in this research beyond those of everyday life. Although you will receive no direct benefits, this research may help the investigator understand students’ physical and social progress in both inclusive and segregated physical education environments. Confidentiality of your research records will be strictly maintained by ensuring that your name and identity does not become known or linked with any information you will provide.
Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. During the interview, you have the right to skip or not answer any questions you prefer not to answer.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, you may contact Jessica Lukas at 631-903-5148 or jessica.lukas17@stjohns.edu or the faculty sponsor, Dr. Anthony Annunziato at 718-990-7781, annunzia@stjohns.edu, or Long Island Graduate Center School of Education, 120 Commerce Drive, Hauppauge, NY 11788. For questions about your rights as a research participant, you may contact the University’s Institutional Review Board, St. John’s University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

___ Yes, I give the investigator permission to use my name when quoting material from our interview in his/her dissertation.

___ No, I would prefer that my name not be used.

__________________________  ______________
Subject’s Signature         Date

You have received a copy of this consent document to keep.
Semi-Structured Interview Questions

1. What is your opinion of the adaptive physical education class with peer mentors?
2. What is your opinion of the segregated adaptive physical education class?
3. How would you describe the social relationships you observed in adaptive physical education this year?
4. Can you tell me the positive/negative impacts you observed during adaptive physical education this year?
Vita

Name  Jessica Lukas

Baccalaureate Degree  Bachelor of Arts, St. Joseph’s College, Patchogue
                     Major: Child Study & Special Education

Date Graduated  January, 2005

Other Degrees and Certificates  Master of Science, Dowling College, Oakdale, Major:
                               Literacy Education
                               Post Master’s Advanced Graduate Certificate in
                               Educational Leadership (2012)

Date Graduated  January, 2009