THE EFFECT OF CO-TEACHING ON STUDENT READING ACHIEVEMENT SCORES

by

William Joshua Taylor

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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APPROVED BY:

Rebecca M. Lunde, Ed.D., Committee Chair

Christopher Clark, Ed.D., Committee Member

ABSTRACT

The purpose of this study was to examine the effects of the co-teaching model on student performance on a high-stakes reading assessment. The significance of this study was to show the need for this type of research and the need for further research dealing with high-stakes assessments, its impact on at-risk students, and ways to assist at-risk students with preparation for high-stakes assessments. This study utilized a quantitative, causal-comparative design to determine if the co-teaching model influences student achievement scores while controlling for prior knowledge. The participants for this study were drawn from a convenience sample of eighth grade students from two public middle schools located in northwestern Florida, also known as the Florida Panhandle, during the spring semester of the 2017-2018 school year. The data was collected post-facto from the 2017 and 2018 iteration of the Florida Standards Assessment - English Language Arts (FSA-ELA) for the two schools and their co-teaching and traditional classroom populations. Finally, the data was analyzed using a one-way analysis of covariance (ANCOVA) to discover the influence co-teaching has on eighth grade student achievement as measured using students' scores from the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 8. The researcher found that there is a statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores.

Keywords: co-teaching, high-stakes assessment, collaboration, literacy

Copyright Page

Dedication

This dissertation is dedicated to my children, Raegan and Jackson, and my wife, Janae. My family is the greatest accomplishment of my life, and I am thankful for my wife's support throughout this journey.

Acknowledgements

I want to thank God for giving me the opportunity to have such a wonderful life. He has provided me strength in my darkest hours and humility in my brightest moments. I am proud of the profession he has led me into, and I feel I am doing his work. As Romans 12:6-7 reads, "We have different gifts, according to the grace given to each of us. If your gift is prophesying, then prophesy in accordance with your faith; if it is serving, then serve; if it is teaching, then teach."

I want to thank my wife Janae for her love, understanding, and openness to me taking on this great challenge of higher education. She has been supportive every step of the way.

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List of Abbreviations

Adequate Yearly Progress (AYP)

American College Testing (ACT)

Analysis of Covariance (ANCOVA)

Armed Services Vocational Aptitude Battery (ASVAB)

Common Core Standards Initiative (CCSI)

Common Core State Standards (CCSS)

Council of Chief State School Officers (CCSSO)

Co-teaching Professional Development Approach (CoPD)

End of Course Assessment (EOC)

English Language Arts (ELA)

English as a Secondary Language (ESL)

Every Student Succeeds Act of 2015 (ESSA)

Florida Standards Assessment (FSA)

Highly Qualified Teacher (HQT)

Institutional Review Board (IRB)

Iowa Test of Basic Skills (ITBS)

Literacy Passport Test (LPT)

Minnesota Comprehensive Assessment (MCA)

Multi-tier System of Supports (MTSS)

National Assessment of Educational Progress (NAEP)

National Governor's Association (NGA)

Next Generation Sunshine State Standards (NGSSS)

No Child Left Behind Act of 2001 (NCLB)

Partnership for Assessment of Readiness for College and Careers (PARCC)

Preliminary Scholastic Aptitude Test (PSAT)

Problem Solving Team (PST)

Race to the Top (RTTP)

Response to Intervention (RTI)

Scholastic Aptitude Test (SAT)

State Education Agencies (SEA)

Statistical Package for the Social Sciences (SPSS)

Texas Assessment of Academic Skills (TAAS)

Universal Design for Learning (UDL)

Woodcock-Johnson 111 (WJIII-RE)

Zone of Proximal Development (ZPD)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this study was to examine the effects of the co-teaching model on student performance on a high-stakes reading assessment. Chapter One discussed the background of the study relating to the importance of high-stakes assessments in today's public education system, the co-teaching model, co-teaching strategies, and the theoretical basis of the study. The problem statement discussed the issue of at-risk students not achieving passing scores on high-stakes reading assessments. The significance of this study showed the need for this type of research and the need for further research dealing with high-stakes assessments, its impact on at-risk students, and ways to assist at-risk students with preparation for high-stakes assessments. This chapter concluded with the research question and key definitions.

Background

In today's public educational system, there has been an intense focus on the accountability of schools through standardized assessments. Yet, in many ways, educators and students are not achieving the goals set forth by school systems, state education agencies, and the federal government. There are multitudes of factors that may contribute to the lack of progress on these standardized assessments: curriculum rigor, lack of preparation, student ability, motivation, assessment difficulty, and test anxiety (von der Embse, Barterian, & Segool, 2013). An issue that has become an increasing concern among educational stakeholders is the scores concerning reading comprehension (Leu, et al., 2015). Although most public education students are required to take at least one English class each year, one English class may not be enough for students at risk of failing high-stakes reading assessments. One possible solution to assist these students is to promote a co-teaching model that utilizes content-area reading strategies in other

core academic courses to further develop student reading skills, reading comprehension, and critical thinking abilities.

Standardized assessments have become an increasing norm for the American K-12 student. Beginning with President George W. Bush's No Child Left Behind Act of 2001 (NCLB) and the re-authorized Every Student Succeeds Act (ESSA) of 2015 authorized by President Barack H. Obama, students are required to take state-mandated, high-stakes assessments in reading/English language arts and mathematics at multiple times throughout their public education experience (Every Student Succeeds Act, 2015). While the ESSA of 2015 has allowed more flexibility in how states can assess students compared to the previous NCLB Act of 2001, the fact remains that administrators, teachers, and students are held accountable for what is taught, learned, and assessed in public education systems.

At the national level, there are standardized assessments utilized to gauge the strengths and weaknesses of the nation's overall public education system. The National Assessment of Education Progress (NAEP) has been a consistent program used to assess mathematics, reading, science, and writing, as well as new subjects such as art, geography, civics, and economics (The Nation's Report Card, 2017b). While the NAEP is a voluntary assessment that does not affect students' overall grades or school progression, the assessment has shown the general public education system has not reached reading proficiency across grade levels. Since the 1992 administration of the NAEP, the results have continually shown less than half of the nation's children assessed at the fourth, eighth, and 12th grade-levels have achieved reading proficiency (The Nation's Report Card, 2017a).

To help bridge the learning process/high-stakes assessment gap, some schools have implemented a co-teaching model to assist at-risk students (Friend, 2014). Stainback and

Stainback (1984) discussed the implementation of a co-teaching model with the combination of a general education teacher and a special education teacher. The discussion on co-teaching was further refined by Bauwens, Hourcade, and Friend (1989), in that they brought co-teaching into a more mainstream presence. Since then, the popularity of the co-teaching model has increased, especially since the implementation and impact of high-stakes assessments (Friend, 2014).

In one longitudinal study, Walsh (2012) reviewed a co-teaching model utilized in Howard County Schools in Maryland over a six-year period. The researcher found that students that were a part of the co-teaching program increased their scores on reading and mathematics assessments and had higher gains than students had in a separate control group (Walsh, 2012). The county also employed an effective professional development program that utilized professional learning communities, school level coaching, and administrative support to enhance the co-teaching program (Walsh, 2012). This was just one of a few studies that shows effective co-teaching, along with proper training and support, can provide tangible data as to how co-teaching models can improve academic and societal outcomes for students at risk.

As part of the co-teaching model, content-area reading strategies are a way to focus on increasing reading comprehension, reading fluency, and critical thinking in core academic classes (Shanahan & Shanahan, 2008). These reading strategies can occur inherently in most content-area classes and may assist students that are at-risk of failing high-stakes reading assessments (Shanahan & Shanahan, 2008). By analyzing content-area reading strategies and intervention techniques, educational stakeholders may move toward a curriculum that implements evidence-based strategies. These strategies can assist in meeting the needs of at-risk students. With the consequences of high-stakes assessments being instrumental in a student's

academic and post-secondary success, it is necessary to look at ways students can increase their opportunity for success.

At the time of this research, there were 17 states that required students to pass a reading/English language arts (ELA) high-stakes assessment in order to graduate from high school (Education Commission of the States, 2016). For example, students in the state of New Mexico were required to pass Partnership for Assessment of Readiness for College and Careers (PARCC) tests in mathematics and English language arts to graduate with a standard high school diploma (New Mexico Public Education Department, 2018a). For the Spring 2018 iteration of the PARCC ELA assessment, only 31% of students achieved a proficient score (New Mexico Public Education Department, 2018b). This data showed a substantial gap between what students were expected to learn and how they performed on this high-stakes assessment. Another state, Massachusetts, required students to pass a high-stakes assessment in ELA in the 10th grade as part of the state's graduation requirements (Cunningham, 2014). Cunningham (2014) discussed the importance of implementing reading and ELA strategies in all core classrooms to increase reading comprehension and student engagement, while also providing context as to why state assessments were not just a measure of student achievement but also was a measure of the effectiveness of the school systems' curriculum and instruction.

The impact of high-stakes testing has far-reaching consequences. Kern (2013) noted that, "approximately 1,300 juniors from Providence [Rhode Island] high schools-a staggering 60% of the Class of 2014-may not earn a high school diploma" (p. 97). Croft, Roberts, and Stenhouse (2016) discussed the psychological and academic stakes for failing these assessments. "Children's' loss of sleep and illnesses during test season, students' academic disengagement, school closures in marginalized communities, and teacher/principal job losses" (Croft et al.,

2016, p. 76) were just a few of the effects high-stakes assessments and the mandates behind them have caused. Although there have been many reforms to high-stakes testing since the launch of the NCLB Act of 2001, there will continue to be some type of accountability assessments for students in reading/ELA. It is imperative that students are prepared for these assessments through a wide-ranging, dedicated curriculum and are aware of the possible consequences of not achieving satisfactory scores.

This study was framed by Vygotsky's (1978) sociocultural theory of cognitive development, also known as the social development theory. The social development theory focuses on the central feature of social interaction and exchanges for the development of an individual's understanding (Vygotsky, 1978). Therefore, the community in which an individual learns in plays a vital role in making meaning of one's learning (Vygotsky, 1978). Within this theory, Vygotsky discussed the zone of proximal development. Vygotsky (1978) viewed the zone of proximal development as: "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (p. 86).

Vygotsky (1978) explained that interaction is the doorway in which skills can be developed and suggested that cooperative learning is an essential tool to higher learning. Co-teaching strategies such as team-teaching, small group instruction, scaffolding, and differentiated instruction inherently provide more opportunities for students (Beninghof, 2012). In current educational terms, scaffolding is a teaching method for assisting students by working with an educator or an advanced learner to help achieve learning goals (Beninghof, 2012). Through scaffolding, students are provided a temporary support, which is removed once students have

become successful with the specific task (Beninghof, 2012). Vygotsky's request for scaffolding to enhance students' knowledge can be holistically addressed through the co-teaching method.

Problem Statement

At the time of this study, there was not a curriculum-aligned, nationwide, co-teaching reading-focused program that assisted with the preparation for high-stakes reading assessments. While the Common Core State Standards Initiative (CCSSI) attempted to provide ELA standards that could be applied to all core academic classes, only 41 states still utilized the standards, and standardized assessment scores have not increased significantly since its implementation (Common Core State Standards Initiative, 2017; The Nation's Report Card, 2017a). This is a wide-reaching issue pertaining to the learning and assessment process utilized by the U.S. Department of Education and state education agencies. Multiple states have turned to the co-teaching model since the NCLB Act of 2001. The most recently compiled national data reviewing the co-teaching model showed that at least 23 state education agencies train educators on co-teaching or provide full co-teaching implementation (Muller, Friend, & Hurley-Chamberlain, 2009).

Co-teaching is a frequently recommended model to support students with learning disabilities (Murawski, 2006). Yet, very little research has been conducted to discover the effectiveness of the co-teaching model as it pertains to students taking high-stakes assessments. There have been multiple qualitative studies conducted to investigate co-teaching methods and integration. Mastropieri et al. (2005) showed findings from multiple qualitative studies that specifically researched the practice of co-teaching. The main finding of this study was that co-teaching could be "extremely effective and conducive for promoting success for students with disabilities in inclusive classes;" however, there are still challenges that prevent co-teaching from

being successful in all cases (p. 261). Important themes such as co-teacher compatibility, content knowledge, appropriate curriculum, roles and responsibilities, and emphasis on high-stakes assessments were discovered.

While the co-teaching model is extremely important, it is also necessary for the model to include evidence-based reading intervention strategies to assist the students in increasing content-area knowledge, critical thinking, and reading comprehension (Villa, Thousand, & Nevin, 2013). In one study, Stoddard, Tieso, and Robbins (2015) examined the application of readings strategies, critical discussion, and historical inquiry through a middle school social studies curriculum. The study resulted in significantly higher scores on the NAEP for students undergoing the reading-focused curriculum compared to the students in the control group (Stoddard et al., 2015).

While the preceding studies showed a positive outcome for co-teaching models and reading strategies in a social studies course, there is currently a gap in research discussing the effect the co-teaching model has on student achievement in relation to a statewide high-stakes reading assessment. This study adds to the literature on co-teaching and its effects on high-stakes assessments, specifically reading assessments. The problem is middle school students are not doing well on high-stakes reading assessments, and there is little research that examines co-teaching's effects on student's performance on these assessments (The Nation's Report Card, 2017a).

Purpose Statement

The purpose of this quantitative, causal comparative study was to determine the effects of the co-teaching model on student performance on the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 8 while controlling for students' baseline Florida Standards

Assessment (FSA) - English Language Arts (ELA) Grade 7 scores. This study reviewed the implementation of co-taught core academic/reading intervention courses at two suburban middle schools in the Florida Panhandle.

The participants in this study comprised of 50 students that are part of at least one co-taught core academic/reading intervention course and 50 students in traditional core academic courses. The independent variable, co-teaching, was defined as the co-taught, core academic/reading intervention course. The dependent variable, high-stakes assessment scores, was measured using the scores obtained from the FSA-ELA Grade 8. The control variable for the study was all participating students' scores from the FSA-ELA Grade 7.

Significance of the Study

This study contributed to the emerging base of literature that examines the ways educators can assist at-risk students at being successful in high-stakes reading assessments. There exists a large amount of literature that addresses this issue (Bennett, Calderone, Dedrick, & Gunn, 2015; Dennis, 2009; Gelzheiser, Scanlon, Vellutino, Hallgren-Flynn, & Schatschneider, 2011; Roberts, Vaughn, Fletcher, Stuebing, & Barth, 2013); however, little research exists on the effectiveness of co-teaching to improve high-stakes reading assessment scores. Ghanaat Pisheh, Sadeghpour, Nejatyjahromy, and Mir Nasab (2017) reviewed the effect of the co-teaching model on student performance for students with reading difficulties on a researcher-made assessment. Results indicated co-teaching improved the reading skills of the participants. While this was one of the few studies that provide empirical data in support of the co-teaching model, the assessment utilized was not a high-stakes reading assessment. This study attempted to fill the gap in the research that exists, detailing the co-teaching model's effect on standardized high-stakes reading assessments.

While this study may be significant for the educational research community, it could be very meaningful for struggling readers who have to take reading assessments as a requirement for graduation. With 17 states requiring a passing score on a reading/ELA high-stakes assessment to graduate from high school, these assessments have real-world consequences for these struggling students (Education Commission of the States, 2016). Administrators and policy makers are another group of educational stakeholders who could benefit from this study, as federal and state high-stakes assessment requirements have been increasingly volatile since the adoption of the NCLB Act of 2001 to the more recent ESSA. Assisting struggling readers while they are in the K-12 setting is essential for life-long learning. In modern society, reading comprehension is a skill that is vital to success in education, in one's career, and in one's general quality of life.

Research Question

The research question for this study was:

RQ1: Is there a difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic course while controlling for students' baseline reading scores?

Definitions

1. *Co-teaching* – Co-teaching is when "two or more professionals [are] delivering substantive instruction to a diverse, or blended, group of students in a single physical space" (Cook & Friend, 1995, p. 1). Co-teaching can include collaboration on determining student goals and outcomes, design of strategies and interventions, assessment of student knowledge, and many other components of the classroom (Cook & Friend, 1995).

2. *Content-area reading strategies* - Content-area reading strategies are techniques meant to improve reading comprehension and fluency, critical thinking, and language integration (Manzo, 1980).
3. *Literacy* - Literacy is the ability to read and write. Literacy is a social communication tool that is used to share information between individuals, groups, and communities. Its purpose ranges from expression of basic needs to abstract and critical reasoning (Wolfe & Flewitt, 2010).
4. *Reading comprehension* - Reading comprehension is the "process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (RAND Reading Study Group, 2002, p. 11). The RAND Reading Study Group (2002) goes further in establishing comprehension has three elements: "The reader who is doing the comprehending; the text that is to be comprehended; the activity in which comprehension is a part" (p.11).
5. *Reading intervention* - Reading intervention is an umbrella term for when reading strategies and practices are utilized to help prevent struggling reading from failure and provide better academic outcomes (Hiebert & Taylor, 1994).
6. *Scaffolding* - "Scaffolding is the process that enables a child or novice to solve a task or achieve a goal that would be beyond his unassisted efforts" (Wood, Bruner, & Ross 1976, p. 90).
7. *Zone of Proximal Development* - "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).

CHAPTER TWO: LITERATURE REVIEW

Overview

The purpose of this study was to examine the effects of the co-teaching model on student performance on a high-stakes reading assessment. Chapter Two focused on the study's theoretical framework and related literature. The first section provided the theoretical foundation centered on Lev Vygotsky's (1978) sociocultural theory of cognitive development, also known as the social development theory. The second section examined related literature on recent educational legislation, national and state standardized assessments, co-teaching, and empirical research related to co-teaching. The last section summarized the literature reviewed and how this study addressed the gap in the literature involving the influence co-teaching has on standardized reading assessment scores.

Theoretical Framework

Social Development Theory

Lev Vygotsky (1978), a Russian psychologist, developed the sociocultural theory of cognitive development known as the social development theory. This theory is rooted in the fact that an individual's cognitive development is progressed through social interaction with others, specifically with people who have a higher knowledge or skill that the individual wishes to obtain (Ormrod, 2013). Walqui (2006) noted that the key positions of Vygotsky's social development theory are the following:

- Learning precedes development.
- Language is the main vehicle (tool) of thought.
- Mediation is central to learning.

- Social interaction is the basis of learning and development. Learning is a process of apprenticeship and internalization in which skills and knowledge are transformed from the social into the cognitive plane.
- The Zone of Proximal Development (ZPD) is the primary activity space in which learning occurs (p. 160).

Learning is the main function of the relationship between teaching and a child's development (Vygotsky, 1978). Vygotsky (1978) stated that learning is the, "necessary and universal aspect of the process of developing culturally organized, specifically human psychological function" (p. 90). Learning occurs through a series of social exchanges done with a knowledgeable or skilled tutor who provides instruction or models the intended skill for the child (Vygotsky, 1978).

Vygotsky (1978) stated the primary justification of schooling is for children to gain new knowledge and skills. He identified the ZPD as the transition area in which children are able to complete the necessary function of learning a skill or retaining/applying specific information independently after support. Vygotsky (1978) suggested that when a student is within the ZPD for a specific skill, providing slight assistance should afford the student an appropriate enhancement to achieve proficiency.

Beninghof (2012) maintained that Vygotsky's (1978) social development theory creates the theoretical foundation for co-teaching models. According to Vygotsky, as students learn from those around them, they are able to create an understanding of new knowledge or improve upon background knowledge across a range of experiences and subjects. This inherently provides students the opportunity for the expression of their own thoughts, opinions, and

impressions to others in the hopes of not only social acceptance, but also to increase their self-efficacy (Hurd & Weilbacher, 2017).

Co-teaching depends heavily on the social development theory through the use of differentiation to foster student independence. Differentiation means that students are given diverse choices in their learning, provided content at specific learning levels, afforded the opportunity to work in small groups with a focus on student-centered learning, and/or offered different activities and assessments to evaluate their learning (Conderman & Hedin, 2015). Differentiation can be delivered more efficiently and effectively through successful co-teaching, since a team of educators has the ability to create more engaging learning opportunities (Conderman & Hedin, 2015).

Within differentiation, scaffolding can be applied based off a learner's need. Scaffolding is the support educators provide to students for them to move toward independent understanding (Wood et al., 1976). This support is meant to be temporary and is designed to be taken away as the students become confident in their abilities to understand and apply the newly acquired knowledge or skill (Wood et al., 1976).

The teaching strategies of differentiation and scaffolding are essential components in co-teaching environments, in which the co-educators share roles in “designing, communicating, and monitoring instruction” (Dynak, Whitten, & Dynak, 1997, p. 64). Strategies such as activating prior knowledge, inference, prediction, summarization, and organization of key details can be implemented through scaffolding and differentiated instruction (Dynak et al., 1997). Alongside these strategies, Marzano, Pickering, and Pollock (2001) developed what is effectively known as the "Marzano" strategies. These strategies are the anchor of student learning support systems such as Multi-Tier System of Supports (MTSS), Problem Solving Teams (PST), Response to

Intervention (RTI), and Universal Learning Design (UDL) (SWIFT Center, 2017). These strategies have also been utilized successfully in co-teaching programs (Dieker & Murawski, 2003; Johnson & Brumback, 2013; Moreillon, 2009). When theory, practice, and strategy coincide, the possibility of successful learning increases. The Marzano et al. (2001) strategies are known as the following: (a)identifying similarities and differences, (b) summarizing and note taking, (d) reinforcing effort and providing recognition, (e) homework and practice, (f) nonlinguistic representations, (g) cooperative learning, (h) setting objectives and providing feedback, (i) generate and testing hypothesis, and (j) questions, cues, and advance organizers (p. 12).

The social development theory also expands on how peer-to-peer interaction can increase social and ethical maturity in all students. Both students with disabilities and students without disabilities participating in co-teaching programs could benefit in more ways than just academic achievement (Murawski, 2010; Scruggs, Mastropieri, and McDuffie, 2007; Solis, Vaughn, Swanson, and Mcculley, 2012; Walther-Thomas, 1997). Specifically, the majority of students with disabilities provided positive feedback on feeling included and more willing to participate when in the co-teaching environment alongside students without disabilities (Murawski, 2010; Rea, McLaughlin, and Walther-Thomas, 2002; Scruggs et al., 2007; Solis et al., 2012; Tremblay, 2013; Walther-Thomas, 1997).

In summary, Vygotsky's (1978) social development theory provided the theoretical framework as to how co-teaching can affect academic achievement and overall educational experience for students with disabilities and students without disabilities. By providing students with multiple teachers within the same classroom, there could be new opportunities to improve high-stakes reading assessment scores through co-teaching practices and applications.

Related Literature

The issue of accountability in education continues to push forward the necessity of high-stakes standardized assessments. What has become a growing concern among educational stakeholders is the amount of students failing to achieve proficiency on reading assessments, especially assessments that are required in order to graduate from high school (Kern, 2013). One possible solution to assist students who have reading issues is to provide a co-teaching model that emphasizes reading strategies in different core academic classes. The concept of the co-taught classroom, as a way to assist both students in general education and special education, traces back to Bauwens et al. (1989), in which they described the purpose of cooperative teaching and introduce ways in which it can be implemented in the general education classroom. Since then, co-teaching has become an effective technique to assist both student populations at achieving mutual learning goals and provides shared resources (Friend & Cook, 2013).

Accountability in Education

The U.S. public education system has been overhauled multiple times in the past 20 years. U.S. President George W. Bush's seminal education law, known as the No Child Left Behind Act of 2001 (NCLB), began a new effort on the federal management toward school accountability and standardized assessment mandates (Greene, Huffman, & Polikoff, 2017). U.S. President Barack Obama also signed two important pieces of legislation that would overhaul the educational system during his time in office known as Race to the Top (RTTP) in 2009 and the Every Student Succeeds Act (ESSA) in 2015. RTTP was also combined with the National Governor's Association's (NGA) Common Core Standards Initiative (CCSI) in 2009 (Jochim & McGuinn, 2016). Each of these pieces of legislation has left a lasting impact on the American education system and society in general.

No Child Left Behind. NCLB was considered a bipartisan legislative answer to the issues of failing schools and inequity in public education at the turn of the 21st Century. The legislation required schools to make educational gains every school year under an adequate yearly progress (AYP) plan, increase the number of educators deemed as highly-qualified teachers (HQT), and develop new state-standardized, high-stakes assessments (Hayes, 2015). It mandated all public school students in the third through eighth grades to be assessed in reading and mathematics every year and one more time while in high school. All students also had to achieve specific proficiency goals by the 2014-2015 school year (Steinberg & Quinn, 2017). While high-stakes assessment scores did improve, especially for students who were from lower socioeconomic backgrounds and minority families, the legislation created some unintended consequences (Bush, 2017).

Under NCLB, state departments of education, education agencies, and school systems received penalties if they did not meet AYP, which included losing funding, mandatory tutoring, forced removal of administrators, and even school closings (Shoffner, 2016). This led to the speculation that many schools may teach to the assessments instead of engage in wide-ranging curriculums. While NCLB pushed an increase focus on school accountability and high standards for all students, it fell short in the realization that not all schools and students are the same. Dee and Jacob (2010) found that overall educational funding per student increased by $570 per year under NCLB, yet there were no significant increases in reading scores and minimal gains in mathematics scores. The financial and educational cost of NCLB was just not enough to justify the benefits.

Race to the Top and Common Core Standards Initiative. Race to the Top (RTTP), signed in 2009 and implemented from 2010 to 2013, was a competitive federal grant program to

align states' curriculums with Common Core State Standards (CCSS) (Jochim & McGuinn, 2016). The National Governors Association (NGA) and the Council of Chief State School Officers (CCSSO) created the Common Core Standards Initiative (CCSI) in order to better prepare students for career and postsecondary education by providing 21st century educational standards (Shanahan, 2015). RTTP and CCSI together provided $4.35 billion in funding to states that met and exceeded RTTP requirements while in competition with other states. The requirements included reforms with state standards, high-stakes assessments, educator evaluations, improvement of educator preparation programs, improved interventions for low-achieving schools, the implementation of improved data systems, and lack of prohibiting or the adoption of charter schools (U.S. Department of Education, 2009).

Originally, 45 states adopted CCSS by the end of 2011 with 40 of those states entering the first round of the RTTP grant program (Weiss & Hess, 2016). Eventually, 12 states would receive RTTP funding with the largest winners being Florida and New York, receiving $700 million each, and Tennessee receiving $500 million for their respective state's educational budget (Howell, 2015). Some of the better outcomes of the program were that 38 states revised their educator evaluations to include student growth or achievement, 35 states still had school-choice programs, and 43 states kept CCSS-aligned standards (Weiss & Hess, 2016). Jochim and McGuinn (2016) found that the CCSI and RTTP drew criticisms from many education stakeholders with some calling it nothing more than an extension of NCLB. As of 2016, only 20 states utilized high-stakes assessments that implemented Common Core standards (Jochim & McGuinn, 2016).

Every Student Succeeds Act. The Every Student Succeeds Act (ESSA), signed and enacted in 2015, was considered the answer to the backlash the NCLB policy received from

educational stakeholders. The new legislation provided state education agencies (SEAs) and local school districts more autonomy in providing what was deemed best for their schools and students (Dulgerian, 2016). States were no longer imposed punishments for schools deemed to be failing and were not required to implement federal curriculum standards such as the CCSS (Shoffner, 2016).

One of the lasting legacies of the NCLB that was reauthorized by the ESSA was the continual requirement of grade level high-stakes assessments for students in mathematics and reading (Ladd, 2017). These high-stakes assessments no longer came from national standardized assessments, such as the National Assessment of Education Progress (NAEP), but were implemented by each state's department of education with their approved, developed curriculum (Shoffner, 2016). ESSA required states to "report data for whole schools is disaggregated for different subgroups of students, such as Emergent Bilingual students, students in special education, racial minorities, and students from families in poverty" (Fránquiz & Ortiz, 2016, p. 1). By doing so, there was still accountability for each population of students, especially those at higher risk of having learning issues (Fránquiz & Ortiz, 2016). States were also required to provide non-high-stakes-assessment measures of student achievement and school progress (Dulgerian, 2016). The transition to the requirements under ESSA was completed in full during the 2017-2018 school year (Ladd, 2017).

Student Achievement

The overarching goal of the legislation discussed previously was to have accountability to ensure students are actually learning. One of the main ways students are held accountable is through high-stakes assessments, which is a major part of every piece of federal legislation pertaining to improving the public education system. The major assessment that showed student

achievement in American public schools is the National Assessment of Educational Progress (NAEP), which had shown some stagnant achievement trends among recent student assessment results. State assessments also provided data on how students were achieving in the classroom with some states tying assessment scores to students' ability to graduate with a high school diploma.

National Assessment of Educational Progress. The NAEP was nationally implemented in the 1969-1970 academic year in a voluntary nature to assess students in 4th, 8th, and 12th grade in a variety of subjects, which included mathematics, reading, science, and writing (The Nation's Report Card, 2017). The most recent NAEP results from 2017 showed that only 37% of 4th-grade students and 36% of 8th-grade students, that were assessed, achieved at or above proficiency levels in reading (The Nation's Report Card, 2017a). While these numbers show an increase since the 1992-1993 administration of the NAEP, it showed a majority of students that were assessed were not meeting the standard set forth by the public education system.

State assessments. Every state is required to have a high-stakes ELA/reading assessment that students must take from the third grade through the eighth grade, as well as once during their high school career (Education Commission of the States, 2016). At the time of this research, there were at least 17 states that required students to achieve a satisfactory score on a reading high-stakes assessment (or an equivalent measurement) in order to graduate with a high school diploma (Education Commission of the States, 2016). Students in the state of Florida were required to achieve a satisfactory score on the Florida Standards Assessment - English Language Arts Grade 10 (FSA-ELA 10) to graduate with a high school diploma (Florida Department of Education, 2017b). In the 2016-2017 iteration of the FSA-ELA Grade 10, only 46% of students achieved a satisfactory score (Florida Department of Education, 2017a).

Students were allowed to retake the assessment in both the 11th and 12th grades, or students could replace the assessment with a score of at least 19 on the American College Testing (ACT) Reading portion, or a Scholastic Aptitude Test (SAT) Evidence-Based Reading and Writing score of at least 430 (Florida Department of Education, 2017c).

New Jersey public school students were required to pass one of the Partnership for Assessment of Readiness for College and Careers (PARCC) ELA 9th, 10th, or 11th grade assessments (New Jersey Department of Education, 2017). For the Spring 2017 iteration of the three assessments, 52% met the 9th-grade requirement, 46% met the 10th-grade requirement, and only 38% met the 11th-grade requirement (New Jersey Department of Education, 2017b). Students were allowed to substitute the PARCC ELA assessments with scaled scores on the SAT, ACT, Preliminary SAT (PSAT), or Armed Services Vocational Aptitude Battery (ASVAB) (New Jersey Department of Education, 2017a). In order to receive a Texas high school diploma, students were required to achieve a passing score on the English I and II end-of-course (EOC) assessments (Texas Education Agency, 2017a). For the Spring 2017 administration of the assessments, only 54% of first-time tested students met the minimum score for the English I EOC and 54% for the English II EOC (Texas Education Agency, 2017b). Students were allowed to retest once every semester after the first failed attempt, including a summer testing session (Texas Education Agency, 2017b).

Co-teaching

The evidence presented shows there was a substantial gap between what students were required to know and what they had shown through multiple high-stakes assessments. Though high-stakes assessments have switched from being federally mandated to state mandated, these assessments are not going away anytime soon for the American public education system. One

possible solution to close the gap is to introduce co-teaching opportunities for students that are at risk of failing reading high-stakes assessments. The following section discusses what co-teaching is, employed models, strategies, and research that provides context as to why co-teaching is an important step to closing the achievement gap previously mentioned.

Co-teaching defined. Co-teaching is when two or more qualified educators prepare lessons, teach, and assess together for the same students, at the same location, and at the same time (Cook & Friend, 1995). This method of instruction provides an opportunity for multiple strategies of intervention, which includes differentiated instruction and individual student/group focus (Beninghof, 2012). When educators can design and monitor instruction together, they can activate prior knowledge and build new knowledge for all students, including struggling learners (Dynak et al., 1997). Bauwens et al. (1989) brought co-teaching into mainstream educational practice by discussing the pairing of a general education teacher and a special education teacher in the same classroom; however, variations have most likely existed much earlier that included pairings of two general education teachers or other types of professional educators within the same classroom instructional period.

Co-teaching models. Friend and Cook (2013) developed the seminal piece of literature discussing the six major models of co-teaching. They are defined as the following: one teach/one observe, one teach/one support, team teaching, alternative teaching, parallel teaching, and station teaching. Each model has its own benefits and can be adapted for multiple types of classrooms and students.

In the one teach/one observe model, one educator leads instruction while another educator supports the lesson by circulating the room, adapting materials, and generally assisting students in need. When one teacher leads the classroom in instruction while the other educator

collects data through observing the students, it is considered the one-teach/one support model. Team teaching is when both educators instruct the class in collaboration, usually by utilizing fast-paced instruction. When a group of students need specialized attention during class, the alternative method allows for one educator to lead a larger group of students while the other educator assists a smaller group. Parallel teaching is when the educators split the classroom and instruct the same lesson. This is usually done when participation by every student is essential to the lesson. The final model, station teaching, allows both educators to instruct in small groups through a rotation that can include independent working groups without the instruction of an educator (Friend & Cook, 2013). All models are developed and designed to provide content-area educators, special educators, and other educational professionals the ability to provide instruction or assistance to one, some, or all students within a classroom.

Dynamics of co-teaching. A major assumption that accompanies co-teaching programs is that the presence of multiple professional adults in the classroom should make instruction more effective. Using coded data sourced from the observations of more than 5,000 direct classroom interactions at the high-school level, researchers found a non-statistically significant decrease in the number of disruptions in co-taught classrooms (Sweigart & Landrum, 2015). More importantly, there were statistically-significant increases in instances of positive and negative feedback to students, as well as more frequent small-group and one-on-one student to teacher interactions (Sweigart & Landrum, 2015).

Co-teaching, in most instances, differs from student teaching primarily in the authority and responsibility of the master teacher in the case of an apprentice, whose qualifications are usually less extensive (Friend, Embury, & Clarke, 2015). Instead, co-teaching usually involves multiple teachers recognized as professional educators. Co-teaching effectiveness may be

related to the personality of co-teachers, as suggested by a review of 11 studies gathering the perceptions and attitudes of preservice co-teachers (Shin, Lee, & McKenna, 2016). The dynamics of co-teaching, when the teaching pairs working in collaboration consist of English as a secondary language (ESL) and general education teachers, is also an important, and unexplored, factor (Kwon, 2018).

Co-teaching success. While co-teaching has been an increasingly popular method to assist learning in the general education classroom, there were few empirical studies showing the influence it has on student achievement. Quantitative studies using high-stakes assessments were the most scarcely available data providing insight to co-teaching programs' effectiveness in academic gains.

In one quantitative study, the Minnesota Comprehensive Assessment (MCA) and the research edition of the Woodcock-Johnson 111 (WJIII-RE) were utilized to find if students in a co-teaching program had different reading and mathematics achievement gains compared to students in a traditional classroom setting (Bacharach, Heck, & Dahlberg, 2010). The MCA was a required, high-stakes, state-standardized assessment that public school students in the state of Minnesota were required to take to measure their performance in relation to state standards. The WJIII-RE was a cognitive abilities assessment that was utilized as a pre- and post-intervention measure for the study. Bacharach et al. (2010) used a chi-squared analyses to reveal "students in co-taught student-teaching settings attained higher mean proficiency levels than did either of the other groups" (p. 11). These results corresponded with the results of Riedesel (1997), which showed middle school students within a co-teaching classroom had higher academic achievement scores than their peers in the traditional classroom based on the Texas Assessment of Academic Skills (TAAS).

A particularly well-known high-stakes assessment that was utilized in multiple studies to gauge the success of co-teaching programs was the Iowa Test of Basic Skills (ITBS). For instance, Rea et al. (2002) studied how students with disabilities could be served through the implementation of co-teaching while in the general education classroom at a public middle school. Students were measured on three academic achievement indicators: their final course grades in all core academic courses, the ITBS, and the state-mandated proficiency test known as the Literacy Passport Test (LPT) (Rea et al., 2002). The core academic courses for this study were defined as language arts, history, mathematics, and science courses. Student discipline referrals and school attendance records were also reviewed. By comparing two middle schools, in which one school utilized cooperative teaching methods while the other school incorporated the traditional dedicated special education programs, Rea et al. (2002) discovered that students in the cooperative learning environment had significantly higher scores on the ITBS subtests in language and mathematics, as well as higher final grades in language, reading, science, and mathematics.

Brusca-Vega, Brown, and Yasutake (2011) investigated the implementation of co-teaching science courses for students with disabilities and students without disabilities. The focus of this study was middle school students in the 6th and 7th grades. The ITBS was used as a pretest/posttest to review whether students had increased learning gains in science utilizing the co-teaching program (Brusca-Vega et al., 2011). The classes had five science and special educators, 21 students with disabilities, and 41 students without disabilities. The data analysis included the ITBS scores, educator interviews, and classroom observations (Brusca-Vega et al., 2011). Comparably to Rea et al. (2002), findings from Brusca-Vega et al. (2011) indicated that test scores from the ITBS showed statistically significant gains in science achievement for both

students with disabilities and students without disabilities. Educators and administrators involved in the study stated that the co-teaching model functioned well within their academic programs (Brusca-Vega et al., 2011).

In the elementary setting, students with disabilities have been one of the most targeted student populations to be assisted with the co-teaching classroom models. Tremblay (2013) discovered students with disabilities had achieved higher outcomes on reading and writing scores in co-teaching classrooms compared to students in traditional special education classrooms after assessing 353 1st- and 2nd-grade students with and without disabilities on the Observation Survey of Early Literacy Achievement for reading and writing. Tremblay (2013) found that the gap in mathematics, reading comprehension, and writing scores between students with disabilities in special education classes significantly increased compared to students with and without disabilities in the co-taught classrooms. The study did have important limitations, as 25% of the students within the co-taught classes were placed into special education classes by the end of 1st and 2nd grade. This may have altered the results due to students with low success rates in the co-taught classes being placed in the special education classes that were counted for the latter.

Over-arching studies that expanded across grade/school levels were few and far between. In one system-wide study, Hang and Rabren (2009) reviewed the viability of the co-teaching model while it was being employed for students with disabilities between the 1st through 10th grade levels at seven, system-connected schools. This study included 31 general education teachers, 14 special education teachers, and 58 students with disabilities within four elementary schools, one middle school, one junior high school, and one high school at a southeastern U.S. public school system (Hang & Rabren, 2009). Teacher perspective surveys and student

perspective surveys were utilized to rate the co-teaching classroom experience utilizing a 5-point Likert-style scale.

Classroom observations were also conducted with co-teaching educator roles, student grouping, and educator location within the classroom as indicators (Hang & Rabren, 2009). The SAT National Percentile Ranks, discipline referrals, and absentee records for the co-teaching year and the year prior were used to assess student achievement, behavior, and attendance. The SAT scores were translated into National Curve Equivalents (NCE) to appropriately analyze the data (Hang & Rabren, 2009).

The researchers found a statistically significant difference in reading and mathematics scores of students with disabilities while participating in co-taught classes compared to the previous year, in which those students were taught in only traditional classrooms (Hang & Rabren, 2009). Students with disabilities in the co-taught classes had overall mean score increases, and these increases were similar to the gains achieved by the entire student population (Hang & Rabren, 2009). This suggests that co-teaching can provide appropriate academic support for students with disabilities, since those students' gains were on track with students without disabilities. These findings coincided with Murawski (2006), which conducted research that reviewed whether traditional education, self-contained, or co-taught classes would be more beneficial for students with disabilities. The data revealed that students with disabilities had higher academic achievement in the co-taught classroom than they did in the traditional or self-contained classrooms.

Researchers have also examined co-teaching utilization in higher education, but applied some of the implications to the K-12 context. Ricci and Fingon (2018) tracked a variety of co-teaching, higher education courses and sessions. The study combined observation of co-

teaching, in both special education and general education-focused sessions, given to university-level education students across a variety of topics. The sessions involved in-class activities along with lists of resources provided to students to facilitate in-class and out-of-class learning, as well as homework assignments. All of the university course sessions examined directly concerned co-teaching, including sessions on establishing a common frame of reference between co-teachers who collaborate across the general education and special education specialties. Researchers tracked the sessions for 59 university students taking part in a joint program intended for both special education and general education students. Ricci and Fingon (2018) found that survey data showed that co-taught sessions were beneficial learning experiences for participants, and that the overall themes that emerged specified that students understood the benefits of co-teaching in their present and prospective classroom settings to help all students.

Some studies applied localized assessment scores to compare data between co-teaching classrooms alongside traditional classroom settings. In the evaluation of a newly formed co-taught, 8th-grade mathematics class, midterm and final exams were employed respectively as pretest and posttest measures of student achievement between two co-taught classes and two traditional classes (Jang, 2006). While both the co-teaching and traditional classrooms had higher posttest mean scores than pretest scores, the average exam scores of students in the co-teaching classrooms were higher than the scores of students in traditional classrooms (Jang, 2006). Rigdon (2010) found comparable student achievement results in a co-taught 8th-grade mathematics class on an educator-made, basic skills algebra assessment.

Not all studies provided measurements of achievement based off of assessment scores. In a qualitative analysis, Walther-Thomas (1997) found that participants with disabilities reported improvement in self-esteem, increases in academic achievement at the classroom level, healthier

social skills progression, and developed more positive peer relationships. Students with disabilities within a cooperative learning environment have also shown to have significantly fewer absences than students in the traditional special education classes (Rea et al., 2002). These findings coincide with Tremblay's (2013) findings that students with disabilities had better attendance records at the elementary level in co-teaching classrooms compared to traditional special education classrooms. Hang and Rabren (2009) showed there were statistically significant differences in discipline issues and school attendance when students with disabilities were in co-taught classes; however, contrary to the findings in Tremblay (2013) and Rea et al. (2002), the results indicated that students with disabilities had more absences and discipline referrals while in co-taught classes. Educators and administrators have also seen increased benefits for students without disabilities in co-teaching programs as well. Those benefits included increases in academic achievement, more one-on-one attention with educators, better classroom learning communities, and more focus established to increase cognitive strategies, social skills, and study habits (Walther-Thomas, 1997).

Two major metasynthesis of qualitative research have been conducted regarding co-teaching in inclusive classrooms and collaboration models. Scruggs et al. (2007) took qualitative data from 32 separate co-teaching investigations utilizing primarily qualitative research methods while Solis et al. (2012) summarized research included four inclusion and two co-teaching syntheses, which altogether utilized 146 studies. Scruggs et al. (2007) developed four major themes from the metasynthesis: a) benefits of co-teaching, b) expressed needs of co-teachers, c) teacher roles, and d) instructional delivery in co-taught classes from using the data of studies having the total participation of "454 co-teachers, 42 administrators, 142 students, 26 parents, and 5 support personnel.... representing every region of the United States as well as areas in

Canada and Australia" (Scruggs et al., 2007, p. 398). The researchers found that co-teaching can provide a multitude of benefits for both educators and students. Most educators reported positive experiences during their roles in co-teaching pairs. Solis et al. (2012) found that the instructional models studied the most were "whole class–teacher led, two heterogeneous groups, two homogeneous groups, station teaching, whole class plus small group, and whole class team teaching" (p. 501). The models that were the most effective were not necessarily based off of the type of instructional model but how the curriculum was changed to provide basic skill enhancement through the educational instruction (Solis et al., 2012).

Student perspectives. Student perspectives appear relatively infrequent in the current literature on co-teaching. One such study found that students appreciated a range of benefits from co-teaching that include profiting from the perspectives of multiple teachers and experiencing multiple styles and approaches to learning (Satterlee Vizenor & Matuska, 2018). Students from this study also expressed the perception that teachers were willingly more accessible in co-teaching arrangements; with one often delivering a lecture while another remained available to assist students individually or in groups. Multiple student focus groups from Bacharach et al. (2010) also reported that teacher assistance was more readily available through the co-teaching model. A majority of students had a preference of having two different teaching styles in the classroom, felt co-teaching classrooms improved student/peer behavior, and were able to develop a higher sense of student/school connectedness (Bacharach et al., 2010).

Jang (2006) discovered that a majority of students, 55% in one co-taught class and 53% in another, reported that the co-teaching model of instruction had positively impacted their final exam performance. Many students provided statements through student interviews,

observations, and questionnaires that the two separate teaching styles of the co-teachers had offered them more opportunities to learn the mathematics content. An even larger portion of students surveyed, 62% in one class and 65% in the other, reflected that the co-teaching model had been superior to the traditional method of mathematics instruction (Jang, 2006). Wilson and Michaels (2006) also found that student feedback showed support for co-teaching. Students reported that having two educators made the class seem more flexible, increased the amount of attention provided to each student, and improved their academic achievement (Wilson & Michaels, 2006).

Scruggs et al. (2007) discovered most students without disabilities showed increased cooperation within co-teaching classrooms, while students with disabilities reported having more specialized attention and worked more diligently. Solis et al. (2012) also concluded that most students with disabilities provided positive feedback on inclusion and co-teaching instructional models based on equity, fairness, and social bonding. Also, most students without disabilities responded with positive perceptions of the models, especially when the classroom promoted high levels of engagement and assistance (Solis et al., 2012). When students with and without disabilities can learn and develop alongside each other, it benefits the school community and culture as a whole. Student grouping was also shown to provide mixed perceptions and beliefs. While some students and educators found peer-grouping, small group discussion, and activities to be effective, most educators relied more on whole-group instruction and strategies (Solis et al., 2012).

Co-teaching relationships. For a co-teaching/collaborative team to be successful, the co-teaching pair must have a strong bond that focuses on working and learning together (Sparks, 2013). Accountability, teamwork, and trust are common themes discussed on how to make co-

teaching teams prosper. When conditions are appropriate, co-teaching models may thrive. Co-teaching pairs have to build a foundation of trust and partnership to be successful (Sileo, 2011). Open dialogues of communication as well as compromise could keep the professional co-teaching relationship moving forward (Sileo, 2011).

One such example came from a case study of a successful professional teaching relationship between a co-teaching pair in a world history I high school class (van Hover, Hicks, and Sayeski, 2012). The co-teaching pair in this particular study had a balanced relationship that was built on professional respect and trust. The pair had "similar backgrounds, compatible personalities, teaching styles, and a basic mantra of 'let's just respect each other as professionals (van Hover et al., 2012, p. 274).

While most co-teaching programs were implemented using a veteran pair of educators, Bacharach et al. (2010) established that student teachers that co-taught with mentor educators positively impacted student performance. Many student teachers are placed in a classroom to observe for a specified amount of time and are then expected to take over the classroom as the mentor educator observes. This format has pushed student teachers into a corner of either succeeding or failing without much support from their mentor teacher (Bacharach et al., 2010). In this study, the student teachers and cooperating teachers essentially became co-teaching teams to address student needs, while at the same time offering student teachers more support and guidance. The teams were required to collaborate, communicate, and plan together as if they were regularly defined co-teaching pairs (Bacharach et al., 2010). While this type of co-teaching program was not a traditional model of two professional educators, it had the potential to be utilized in teacher education programs to prepare educators for future co-teaching instructional programs.

Qualitative research suggests both teamwork and a mutual understanding of the unique roles of each teacher were significant to a successful co-teaching model (Magiera, Smith, Zigmond, & Gebauer, 2005; Shaffer & Thomas-Brown, 2015). In Walther-Thomas (1997), educators revealed that the co-teaching model made them more satisfied with their job, increased their opportunities for professional development, and provided more occasions for support and collaboration with other educators. Educator interviews from the finding of Brusca-Vega et al. (2011) also provided evidence that the teachers found the co-teaching method as a valuable platform for students with disabilities to be in the least restrictive environment, and provided students without disabilities a positive learning experience with sufficient academic rigor.

Classroom observations also presented that co-teaching classrooms offered the opportunity for more teacher-to-student curriculum engagement and constructive student communications with peers (Brusca-Vega et al., 2011). Teachers also responded that models would work more efficiently when provided better resources, cooperative planning time, and more professional development (Solis et al., 2012). Teacher perception and attitude varied; however, most became more favorable of collaborative models over time.

Professional development. Professional development was also identified as an important factor in successful co-teaching relationships (Pratt, 2014). New research on efficacy in co-teaching moves the shared efficacy expectations from the school level onto the co-teaching pairs (Krammer, Gastager, Lisa, Gasteiger-Klicpera, & Rossmann, 2018). Interview responses and multiple regression analysis suggested that characteristics of co-teaching units considered as a team are more important to perceptions of efficacy and success than characteristics of individual teachers within the co-teaching unit (Krammer et al., 2018).

Teacher efficacy and self-perceptions of efficacy were identified as critical in the success of co-teaching efforts in qualitative-data interview responses provided by teachers who co-taught in a Midwestern U.S. primary school (Hawkman, Chval, & Kingsley, 2018). The teachers also engaged in professional development and competency training through a mandatory program of attending faculty meetings and events. This was sanctioned, as practical experience that was noticeably different from what teachers would have received from teacher education programs or through other formal means.

Qualitative interview responses suggested that teachers learned to think critically about their personal make-up and how this affected co-teaching performance in the professional setting. They also exhibited beginnings of a critical-constructive discourse with colleague co-teachers, such as when one participant reflected on the desire for control of a colleague and how this would prevent difficulties in the future, despite his or her acknowledging the tendency for this (Hawkman et al., 2018). Teacher preparedness was identified as an underappreciated reason for success in co-teaching, with a study of 77 teachers in general education and a smaller group of special education teachers finding that most showed a lack of preparedness to engage in co-teaching (Chitiyo & Brinda, 2018). The teachers polled admitted to a lack of confidence in co-teaching, with only half indicating confidence in the method. Nearly 60% of participants admitted to feeling a need for additional training and professional development applying the co-teaching model.

It is possible for newly paired co-teachers to become successful with a solid support structure (van Hover et al., 2012). Both teachers in the study credited a weeklong professional development intensive to assist them in establishing ground rules and teacher roles to support the beginning of their co-teaching relationship (van Hover et al., 2012). Professional development

continues to have an increasingly important role for establishing effective co-teaching instructional programs.

Brusca-Vega et al. (2011) added in their findings that the educators received professional development opportunities for co-teaching strategies before and throughout the school year. Co-teaching teams were also afforded co-planning time each day. These findings assist with the understanding that co-teaching programs must have adequate administrative support through the means of opportunities for professional development, co-planning, and curriculum resources to become and maintain a successful program. Riedesel (1997) included in the discussion that the preimplementation process is an important stage for open discussion and administrative support prior to implementing a co-teaching unit.

Exploratory research emphasized the potential role of co-teaching in achieving professional development for both general education and special education teachers (Luke & Rogers, 2015). Shaffer and Thomas-Brown (2015) examined the validity of the Co-teaching Professional Development Approach (CoPD), finding that gains to content knowledge and pedagogy assisted both the special education and general education instructors who collaborated. Professional development through responsive teaching strategies was also a feature of an observational study examining co-teachers in early childhood education classrooms (Hulin, 2018).

Co-teaching and classroom discourse. A study carried out in a different style of co-teaching context examined forms of discourse between students and teachers, and among co-teaching instructors in science education (Rees, Carol & Roth, 2019). Motivation for the study was to look into the perceived view that teacher-centered discourse dominates in spite of the fact that researchers recommend more student-centered discourse to increase instructional

effectiveness. The students and teacher in the class that were examined were scaffolded and transitioned toward a different discourse with the aid of a co-teacher (secondary). The forms of discourse that became dominant in the scaffolded classroom after the transition included teacher-authoritative and an interactive, dialogue-centric discourse.

The dialogue-centric discourse form became more prominent as the focus of the material moved to scientific inquiry driven by students themselves and after learning the general principles of the method. The study was also notable for its specific approach to co-teaching deployment. In particular, it used a "gradual release of responsibility format" (Rees et al., 2019, p. 6). This mediated the classroom instruction and dispersed authority between co-teachers as the course curriculum moved from a teacher-authoritative to a student-dialogue focus. In separate research, teachers expressed concerns with how co-teaching changes student perceptions of authority among co-teachers when moving to this practice (Kelley, Brown, & Knapp, 2017).

During the second stage of the course, the co-teacher joined the primary teacher during classroom instruction. This stage required students to make scientific observations, developed research questions, and designed experiments. In the final stage of the course, the secondary co-teacher led the class without help from the primary teacher. While the secondary teacher conducted the class alone, both the primary and secondary teacher developed the lesson plan utilized during this stage. To collect data across the four course stages, researchers made use of video and audio recordings of classroom proceedings (Rees et al., 2019).

The use of multiple cameras allowed researchers to collect cross-sectional data. One camera was focused only on the active teacher, while two additional cameras were trained on the classroom of students. To analyze the collected audio and video data, the researchers utilized

interaction analysis as well as conversation analysis. Findings included that there was a shift in discourse types between the initial stage and the student-led participatory stages of the class. In the first set of phases, the teacher-student discourse was teacher led with most discussion coming from the primary teacher asking closed-ended questions and the students responding with closed-ended answers. In the later stages, the discourse type became less authoritative and more like a dialogue (Rees et al., 2019). The change in discourse types was driven primarily by the higher frequency and duration of student sharing periods in the later course phases (2-4).

This change reflects similar research that suggests how teachers can encourage a movement from procedural to explorative participation through classroom discourse practices (Heyd-Metzuyanim, Smith, Bill, & Resnick, 2018). Some prominent and notable co-teaching elements included the secondary teacher's practice of acknowledgement as opposed to evaluative feedback. Co-teaching was viewed by the researchers as being instrumental in facilitating the shift in discourse forms between the phases of instruction. This was an innovative and insightful study, and the scarcity in the literature on the topic of discourse trends and changes during co-teaching suggests that more research should be focused in this area.

A separate study also examined the use of modeling and scaffolding as important co-teaching mentoring strategies (van Velzen, Volman, & Brekelmans, 2019). This was in the context of research on the use of co-teaching as part of a broader strategy using the collaborative mentoring approach (CMA). The researchers examined the techniques in the context of secondary education in the Netherlands, and there were five pairs of mentors and student teachers in this qualitative, unstructured study. Study participants noted that the scaffolding allowed for a reduction in downtime while the co-teacher or student teacher was active. Methods of the study included research data drawn from the first-hand experiences of three separate

mentor and student-teacher teams in the Netherlands instructing students from 12 to 18 years of age (van Velzen et al., 2019).

Data for these case studies was collected with the use of audio recordings and video, recorded both during and after teaching sessions. Researchers segmented video and audio recordings into separate chunks, and categorized practical knowledge frames used along with modeling actions and scaffolding actions (van Velzen et al., 2019). Both prelesson and postlesson conversations were held with and between the co-teachers. The teachers created mind maps to clarify their different perceptions about teacher knowledge. The mentor created scaffolding while the student teacher was giving a lesson to the class.

A number of challenges that arise during co-teaching are discussed in the most recent literature. The novelty of co-teaching in some geographical areas can be a hindrance, as many teachers are not versed in its methods (van Velzen et al., 2019). A survey of 77 teachers in the US Northeast identified barriers to co-teaching including a lack of essential skills needed for co-teaching and the fact that co-teaching tended to involve the use of more resources than traditional teaching practices (Chitiyo, 2017).

Studies have attempted to address these challenges by suggesting solutions and sometimes change in approach. One such solution was the formation of professional learning communities of teachers through the Collaborative Teacher Project (Jao & McDougall, 2016). Teachers in one group joined together on the basis of a mutual need to overcome challenges encountered during co-teaching and to co-create teaching materials. The Collaborative Teacher Project helped overcome barriers by mitigating teacher expectations of support through shared peer experiences. The researchers indicated that peer observation of co-teaching practices can

provide useful feedback resulting in effective changes that create improved learning outcomes (Jao & McDougall, 2016).

The Collaborative Teacher Project encouraged collaboration, particularly in the form of co-teaching. Teachers used this method to overcome the interpersonal barriers that were seen by some participants as significant in blocking progress, particularly in practicing and sharing knowledge about co-teaching (Jao & McDougall, 2016). One participant cited the deployment of co-teaching practices in the context of math teachers and collaboration practices were needed in order to achieve improvements and greater effectiveness. Another participant noted that collaboration with a co-teacher with a related background and experiences was a contributing element in recent success he had experienced.

Some of the findings were echoed in a study and book chapter on interdisciplinary English and social studies combination course given to students in the 9th grade (Lewis & Gournaris, 2016). Researchers made use of Web 2.0 tools in a co-teaching arrangement to supplement the instructional approach. Findings included an increase in student motivation to learn the interdisciplinary material. The specific tool utilized was i2Flex. Researchers suggested that the i2Flex tool, used in this interdisciplinary co-teaching context, allowed for a more constructivist classroom (Lewis & Gournaris, 2016). This interesting finding was based on limited evidence but does suggest an avenue for potentially fruitful, future research as co-teaching is combined with technological implements to increase student engagement and motivation in the interdisciplinary classroom context.

Co-teaching Instruction

In a study of 129 teachers operating in co-teaching pairs, Pancsofar and Petroff (2016) indicated that changes in instructional methods often consisted in one teacher devising a new

approach or technique, with their colleague tasked with individual attention to students who struggle with the new method, or who have special needs. Qualitative data also revealed particular structural elements of co-teaching and teacher attitudes and perceptions. Teachers engaged in co-teaching pairs indicated a lower opinion of co-teaching when the educators did not employ collaborative co-teaching techniques; those who held more favorable views made heavier use of more collaborative instructional methods (Pancsofar & Petroff, 2016). These findings aligned with the perceptions of co-teachers, voiced in a meta-analysis that co-teaching offered a particularly opportune platform for communication and collaborative work (Shin et al., 2016).

Overcoming challenges faced in co-teaching. Not all co-teaching relationships are, or will become, successful. While the co-teaching model can be effective, the co-teaching pair has to be a good match that is provided the necessary resources to prosper. Isherwood, Barger-Anderson, Merhaut, Badgett, and Katsafanas (2011) reviewed educator relationships as part of the co-teaching model. The researchers conducted interviews with 47 educators and administrators from a rural school district in western Pennsylvania to review issues associated with implementing the previous year's pilot co-teaching program. The common problems found included lack of co-planning opportunities, incompatible or undesirable co-teaching pairs, uneven student ability or behavior level composition in classrooms, lack of curriculum expertise by special educators in the co-teaching pairs, and coding issues with school information systems (Isherwood et al., 2011).

Teachers within multiple co-teaching programs have communicated the necessity of support for the cooperative teams to work effectively (Scruggs et al., 2007). Systems of support, which included administrative support, joined planning time, professional development, and

volunteered pairing, were significant factors to success. Teachers also have to establish defined teacher roles. Most studies found that co-teaching pairs worked in the one teach/one assist model. The major concerns most educators had from these investigations are the issues of taking on subordinate roles and content knowledge. The final theme of instructional delivery reviewed how most general educators plan for whole-class delivery, while special education teachers mainly focused on assisting individual students and supporting the general educator with student focus mainly on the lesson and behavior management (Scruggs et al., 2007). In 20 investigations, many participants stated that there should be at least a "minimum academic and behavioral skills level" for students to participate in co-taught classrooms (Scruggs et al., 2007, p. 402).

Significant and common difficulties to successful co-teaching were identified in a meta-analysis of 11 studies, including differing expectations between preservice and in-service teachers (Shin et al., 2016). Forming successful teaching relationships was cited as a primary challenge for co-teachers working in secondary schools in Iowa (Pratt, 2014). Power dynamics between colleague co-teachers presented barriers to effective co-teaching, with some teachers feeling dominated by their colleague and unable to contribute valuable instruction at what they saw as critical moments. Trouble coordinating between teachers, namely lack of necessary time for co-planning of lesson plans and activities, were also cited as significant challenges in the meta-analysis review (Shin et al., 2016). Large gaps in attitudes toward collaboration among teachers, particularly teachers new to co-teaching environments, may worsen such difficulties. In-service co-teachers reported harboring much-changed attitudes toward collaboration than they did prior to the co-teaching experience (Shin et al., 2016).

Walther-Thomas (1997) also found some persistent problems associated with the co-teaching model. The common issues the participants found comprised of administrative support, special educator caseload issues, student schedule conflicts, cooperative planning time, and professional development. The researcher noted that the elementary school pairs had considerably more issues than the middle school pairs, mainly due to the teacher and student daily schedules and workload compared to the middle school pairs (Walther-Thomas, 1997). Like with any educational model, there are going to be strengths and weaknesses; however, most weaknesses can be corrected with proper training, planning, and adequate resources.

A few studies focused primarily on effective collaboration and communication as a way of progressing and developing co-teaching programs (Ahmed Hersi, Horan, & Lewis, 2016; Pratt, 2014). Co-teachers at secondary schools in an urban district offered responses resulting in the formulation of a "symbiosis" as a strategy for overcoming challenges (Pratt, 2014). This consisted of one another relying on individual strengths when met with particular challenges. The fostering of symbiosis could also help surmount specific challenges faced in co-teaching environments, as was the case in a high school where instructional technology was successfully deployed primarily through generative interactions between co-teaching colleagues (Ahmed et al., 2016). Educators developed "communities of practice" to assist in their goal of assisting students through the use of co-teaching. Communities of practice occur when co-teachers come together as a community of individuals in order to engage in and advance together the practice of pedagogy, meaning making, and social and professional learning (Lave & Wenger, 1991).

Through the view of communities of practice, co-teaching was a process whereby teachers and learners rearrange the meaning of learning together in the pursuit to “become a full participant in a sociocultural practice” (Lave & Wenger, 1991, as cited in Ahmed Hersi, 2016).

In the diverse classroom that served as a case study on co-teaching and symbiosis, teachers and administrators met challenges in part by establishing and working toward the common goal of improving instruction through collaboration, teacher learning, and mutual educator accountability (Ahmed Hersi et al., 2016). Rigdon (2010) also noted that educators in a successful co-teaching model specified that having administrator support from the school and district level, common planning, as well as professional development, helped with their programs' achievement.

Another important challenge identified across the co-teaching literature is inequality and diversity (Pratt, 2014). This was a particular challenge in co-teaching that takes place in the ESL context but occurred with significant frequency in all educational contexts where co-teaching can be found (Kwon, 2018). Diversity can consist not only in ethnicity or language of students and educators, but also in terms of subject specialty and teaching background (Ahmed Hersi et al., 2016). Yet a collaborative and symbiotic working method can turn challenges, which arise because of diverse co-teachers, into opportunities for learning that would otherwise not exist in a non-diverse scenario. Such a method can include developing a strategy of critical-constructive feedback that may include both teachers watching recorded lessons and identifying areas for improvement (Hawkman et al., 2018). Another way that teachers met challenges was through a program of professional development over a yearlong period, in which co-teachers and preservice teachers were encouraged to reflect on challenges while engaged in mentoring sessions.

Researchers presented results that suggest lower student engagement in co-taught classrooms as compared to solo-taught (Sweigart & Landrum, 2015). But co-teaching has been utilized in a large class-size setting with the express purpose of fostering higher engagement with

success (Farrell & Logan, 2018). The technique can also be used as a supplementary educational tool. One study polled the views of 22 multi-grade-level Irish educators working with students who had students with disabilities through questionnaires and semi-structured interviews (Casserly & Padden, 2018). While research participants did not identify co-teaching as the most effective model of teaching as compared to pulling students out of the classroom, they did indicate co-teaching combined with pulling students would be the optimal approach (Casserly & Padden, 2018).

Co-teachers in the elementary education setting at one Midwestern U.S. school emphasized the importance of relationship building, communication, and collaboration to overcoming barriers that arose while co-teaching (Hawkman et al., 2018). Such a strategy would avoid challenges such as one voiced in Shin et al. (2016), in which co-teachers had worked on different levels of the same curriculum in what was described by one study participant as a "big disaster." Different views on content knowledge between teachers is a more pernicious issue, since simple collaboration may not always provide the means to bridge such conflicts (Shin et al., 2016).

One possible way to overcome co-teaching program obstacles is through synergies between co-teachers with different skill sets. An example is the content specialty of general education teachers and the pedagogical techniques and differentiating instructions of special education teachers, as the respective teachers can assimilate the skills specific to their colleague (Shaffer & Thomas-Brown, 2015). There is evidence that co-teaching may be uniquely well-suited to delivering differentiation, particularly in special-needs contexts or with respect to students who exhibit behavioral difficulties (Conderman & Hedin, 2015). Qualitative survey data from co-teachers suggested the importance of preservice training in co-teaching approaches,

as those with more training exhibited a greater level of responsibility-sharing with co-teachers (Pancsofar & Petroff, 2016).

Summary

The previous research provided insight to the general understanding, strengths, weaknesses, and potential of the co-teaching model. Common themes from the data suggested that co-teaching can be productive when properly employed by willing and well-matched educators that are supported with a good curriculum, adequate resources, evidence-based research strategies, professional development, and planning time from their administrators. Yet, there is still diminutive research that has been compiled in recent years that can provide insight as to whether co-teaching can support students in preparation for and increasing achievement on state mandated high-stakes assessments. The opportunity to provide an answer to the gap in the literature has presented itself.

With the lack of recently published quantitative studies regarding co-teaching and its influence on student high-stakes assessment scores, it is important that more research is conducted pertaining to this instructional model. While some research studies had shown promising results, a large portion of those studies were dated. Though local, state, and federal educational legislation is always changing, the requirements to attempt and successfully pass high-stakes assessments are still a reality for many public school students. The findings of this study plans to reveal the need demonstrated by the literature review for additional research on the topic of the different co-teaching models' effectiveness in increasing students' standardized assessment scores.

CHAPTER THREE: METHODS

Overview

The purpose of this study was to examine the effects of the co-teaching model on student performance on a high-stakes reading assessment. In the following sections, the design and execution of this study were discussed. The research question and hypothesis were stated, and the instrument developed to provide the data was described. These sections also included a discussion in regard to the participants, setting, and procedures of the study as well as an explanation of how the data was analyzed.

Design

This study utilized a quantitative, causal-comparative design to determine if the co-teaching model influenced student achievement scores while controlling for prior knowledge. This research design was selected because the researcher was attempting to look at cause-and-effect relationships by researching groups of students in which co-teaching (independent variable) is present or absent and to determine whether the groups of students differed on increases in achievement (dependent variable) while controlling for prior knowledge (covariate) (Gall, Gall, & Borg, 2007). This study used archival data, and the independent variable could not be manipulated.

The independent variable, co-teaching, was generally defined as when a general education teacher and special education teacher planned, taught, and assessed general education and special education students together as equal partners (Bauwens et al., 1989). The dependent variable, student achievement, was the scores on the state-mandated, high-stakes assessment known as the Florida Standards Assessment - English Language Arts Grade 8 (FSA-ELA 8). The control variable, prior knowledge, was the students' scaled scores on the state-mandated,

high-stakes assessment known as Florida Standards Assessment-English Language Arts Grade 7 (FSA-ELA 7). The control group consisted of eighth-grade students that were in traditional core academic courses that do not receive co-teaching instruction.

Research Question

The research question for this study was:

RQ: Is there a difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores?

Hypothesis

The hypothesis for this study was:

H_0: There is no statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores.

Participants and Setting

The participants for this study were drawn from a convenience sample of eighth-grade students from two public middle schools located in northwestern Florida, also known as the Florida Panhandle, during the spring semester of the 2017-2018 school year. The middle schools were located in middle income, suburban towns outside a small metropolitan area. The schools' demographic information is listed below.

School A had 1,013 in overall enrollment of sixth- through eighth-grade students, and eighth-grade enrollment was 338 students. The school's demographics were 85% Caucasian, 5% Hispanic, 5% two or more races, 3% African American, 1% Asian American, and 1% other races. There were 513 females and 500 males. Approximately 31% of students were eligible for

the free or reduced lunch program. The eighth-grade demographics were 82% Caucasian, 5% Hispanic, 5% two or more races, 5% African American, 2% Asian American, and 1% other race. There were 172 females and 166 males. Approximately 27% of students in the eighth grade were eligible for the free or reduced lunch program.

School B had 933 in overall enrollment of sixth- through eighth-grade students, and eighth-grade enrollment was 321 students. The school's demographics were 68% Caucasian, 13% Hispanic, 9% two or more races, 7% African American, 3% Asian American, and less than 1% other races. There were 468 males and 465 females. Approximately 40% of students were eligible for the free or reduced lunch program. The eighth-grade demographics were 65% Caucasian, 18% Hispanic, 8% two or more races, 5% African American, and 3% Asian American, and less than 1% other races. There were 170 males and 151 females. Approximately 29% of students in the eighth grade were eligible for the free or reduced lunch program.

These schools were chosen due to them being comparable in demographics and student assessment scores. One school provided a full-time co-teaching model containing one general education teacher and one special education teacher, while the other school provided the traditional pullout services/intensive classes for students. The eighth grade was selected due to having more students participating in the co-teaching model than the other two grades.

For this study, the number of participants sampled was 100, which exceeded the required minimum for a medium effect size. According to Gall et al. (2007), 96 students was the required minimum for a medium effect size with statistical power of 0.7 at the 0.05 alpha level. The sample was randomly selected from two groups of students using a random number generator. The two groups were defined as students who were either in traditional eighth-grade core

academic courses (control group) or co-taught eighth-grade general academic courses (treatment group). The number of participants in the control group sample was 50 students. The control group demographics were 54% Caucasian, 26% Hispanic, 12% two or more races, 6% African American, and 2% Asian American. There were 30 males and 20 females. Approximately 40% of students in the control group were eligible for the free or reduced lunch program. Also, 12% of the students were identified as students with disabilities. The number of participants in the treatment group sample was 50 students. The treatment group demographics were 82% Caucasian, 8% two or more races, 6% African American, 4% Hispanic, and 0% Asian American. There were 30 males and 20 females. Approximately 42% of students in the treatment group were eligible for the free or reduced lunch program. Also, 26% of the students were identified as students with disabilities.

Instrumentation

Both the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 8 and the Florida Standards Assessment - English Language Arts Grade 7 were used to collect data in this study. The FSA-ELA was a statewide assessment created by the Florida Department of Education to measure educational gains, standards proficiency, and student progress in ELA and reading for all public school students in the state (Florida Department of Education, 2017b). The FSA-ELA 8 reading portion had 52 questions established in the following question formats: 29 multiple choice, three multi-select, nine editing task choice, seven hot text, and four evidence-based selected response (FSA Technical Report, 2018). The assessment had the following established achievement levels with corresponding scores:

> Level 1 (274-321) - Inadequate: Student is highly likely to need substantial support for the next grade; Level 2 (322-336) - Below Satisfactory: Student is likely to need

> substantial support for the next grade; Level 3 (337-351) - Satisfactory: Student may need additional support for the next grade; Level 4 (352-365) - Proficient: Student is likely to excel in the next grade; Level 5 (366-403) - Mastery: Student is highly likely to excel in the next grade. (Florida Department of Education, 2017b, p. 3)

The FSA-ELA 8 was tested for reliability, which resulted with a Cronbach's α of 0.92, a stratified α of 0.92, and Feldt-Raju coefficients of 0.91. According to Gall et al. (2007), a coefficient of 0.80 or higher was sufficiently reliable. Content validity was achieved by aligning a specific number of questions to Florida's Next Generation Sunshine State Standards (NGSSS) for ELA (FSA Technical Report, 2018). The standards' subscales for the FSA-ELA 8 and number of questions in each scale were the following: (a) 15 key ideas and details, (b) 19 craft and structure, (c) nine integration of knowledge and ideas, (d) nine language and editing task, and (e) one text-based writing question (FSA Technical Report, 2018).

The baseline scores from the FSA-ELA 7 were utilized for this study to show prior student knowledge. The FSA-ELA 7 had the same levels of achievement and purpose as the FSA-ELA 8. The FSA-ELA 7 reading portion had 52 questions consisting of the following question formats: 26 multiple choice, six multi-select, 11 editing task choice, four hot text, and five evidence-based selected response (FSA Technical Report, 2017). The FSA ELA 7 was tested for reliability, which produced a Cronbach's α of 0.91, a stratified α of 0.92, and Feldt-Raju coefficients of 0.90, which showed sufficient reliability. Validity of content aligning to the state standards was accomplished by aligning questions in the following format: (a) 14 key ideas and details, (b) 15 craft and structure, (c) 12 integration of knowledge and ideas, (d) 11 language and editing task, and (e) one text-based writing question (FSA Technical Report, 2017).

Procedures

Full Institutional Review Board (IRB) approval was secured before any formal requests to receive data were sent. When full IRB approval was obtained, a formal request for demographic and assessment data was sent to the superintendent of the school district (see Appendix A). The demographic data requested was the following: (a) grade, (b) gender, (c) race, (d) special education status, (e) free and reduced lunch status, (f) randomly assigned letters for each student name linking their FSA 2017 and FSA 2018 scores, and (g) course identifiers for students that were co-teaching and traditional courses at School A and School B. The course identifiers were coded as course 0, which were social sciences courses taught in a co-teaching program, or course 1, which were traditional social science courses. The assessment data requested was the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 8 scores for 2017 and Florida Standards Assessment - English Language Arts Grade 7 scores for 2018 for students from the two selected middle schools that were in the 8th grade for the 2017-2018 school year. Along with those requests, the researcher completed the superintendent's research request forms that were required to conduct research at the district's schools.

The required forms and formal written request was delivered to the assistant superintendent of curriculum, instruction, and assessment via email with the option provided to meet in person. The assistant superintendent approved the research and sent a request for research by email to the respective principals of the two school sites chosen. Both School A and School B administrators agreed to participate in the research and sent the required data via email. Coordination between the research and the principals was made to ensure the students were given random letter identifiers with their names and other personally identifiable information

removed. Those letter identifiers linked the students' demographic data with their FSA assessment data.

The FSA and demographic data was reviewed and sorted based off of the copies obtained from site schools. The data was sorted using Microsoft Excel. Discrepancies, such as students not taking one of the two assessments, were marked and not included in the study's data. Students who scored a Level 3 (330–345), 4 (346–359), or 5 (360–391) for the FSA-ELA 2017 Grade 7 were excluded, as the study was focused on students who are at-risk of failing high-stakes assessments. The researcher utilized a random number generator to randomly select and create the sample population for the study. The data was then coded for utilization in IBM's Statistical Package for the Social Sciences (SPSS) software. Students' scores from traditional eighth-grade core academic classes were coded as 0, and students' scores from co-taught eighth-grade core academic classes will be coded as 1. Once the data was uploaded to SPSS, it was analyzed.

Data Analysis

This study utilized a one-way analysis of covariance (ANCOVA) to discover the influence co-teaching had on eighth-grade student achievement as measured using students' scaled scores from the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 8. An ANCOVA was appropriate to use when the "mean scores on a quantitative outcome variable are compared across groups that may not be equivalent in terms of participant characteristics" (Warner, 2013, p. 688). Since the students had different levels of prior knowledge, an ANCOVA was the most appropriate analysis to use, since an ANCOVA allowed for a statistical adjustment to control for the baseline scores provided from the Florida Standards Assessment (FSA) - English Language Arts (ELA) Grade 7 (Warner, 2013). The total sample

size of 100 allowed the ability to obtain a medium effect size with a statistical power of 0.7 at the 0.5 alpha level (Gall et al., 2007).

The first step in the analysis was to sort the data into SPSS and look for unusual scores. Next, the researcher used a Box and Whisker plot for both score sets to identify any extreme outliers. Once data screening had been completed, the researcher completed tests of assumption for the ANCOVA.

The level of measurement was appropriate since the FSA was measured on intervals by the number of problems correct. The more questions a student responded correctly to, the higher the student's score was. Independent observations were conducted, as one student's score did not predict the scores of other students. Random sampling was conducted, as students' scores from both the co-teaching and traditional core academic class populations were chosen through a random number generator.

The researcher then utilized both histograms and the Kolmogorov–Smirnov test to review if the population distributions were normal to meet the assumption of normality, since the sample population was equal to or more than 50 students' scores (Warner, 2013). A series of Q-Q normal line plots between scores on the FSA-ELA 7 and FSA-ELA 8 for each group of students was used to meet the assumptions of linearity, bivariate normal distribution, and homogeneity of slopes. To prove the assumption of bivariate normal distribution, the data in the Q-Q plots should lie on or near a straight-diagonal line (Warner, 2013). The assumption of homogeneity of slopes was met by ensuring the linear trend lines are parallel or have similar slopes (Warner, 2013). The last test of assumption utilized was the assumption of equal variances, and this met using Levene’s Test of Equality of Error Variances.

After all tests of assumption were met, the researcher completed the ANCOVA in SPSS. In Chapter Four, the researcher reported the *F*-statistics, $F(0, 000) = 0.00$, from the *method* row of the tests of between-subjects effects; the probability value ($p = 0.00$); the partial eta squared, $\eta_p^2 = 0.00$, for effect size found in the *Sig* column.

CHAPTER FOUR: FINDINGS

Overview

In Chapter Four, the descriptive statistics are presented in detail, as well as the data screening and assumptions tests for an analysis of covariance (ANCOVA), to test the null hypothesis. The results of the ANCOVA along with the Post Hoc Boneferroni test are provided in detail.

Research Question

RQ1: Is there a difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores?

Null Hypothesis

$H_0$1: There is no statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores?

Descriptive Statistics

The descriptive statistics are provided through the use of SPSS 26. Table 1 provides descriptive statistics for both the co-teaching and traditional methods for FSA-ELA Grade 7, FSA-ELA Grade 8, and the adjusted means of the FSA-ELA Grade 8. Baseline scores of the FSA-ELA Grade 7 students who would become the co-taught classes had a lower performance (M=317.36, SD=12.07) than students that would become the traditional classes (M=325.32, SD=5.34). The median score for FSA-ELA Grade 7 was 320.00 for the co-taught classes and 327.00 for the traditional classes. Students in the co-taught classes' performance (M=336.26, SD=12.18) was slightly lower than students who were in the traditional core classes (M=337.02,

SD=7.97) when reviewing the FSA-ELA Grade 8 scaled scores without the covariate of baseline FSA-ELA Grade 7 scaled scores. The median scores for both methods were the same at 336. When adjusting for the covariate of FSA-ELA Grade 7 scaled scores, the co-taught classes' performance (*M*=338.61, *SE*=1.29) was higher than the traditional core classes (*M*=334.67, *SE*=1.29).

Table 1

Descriptive Statistics for FSA-ELA 7, FSA-ELA 8, and FSA-ELA 8 Adjusted Means

	FSA 7 Scores				FSA 8 Unadjusted Scores				FSA 8 Adjusted	
Variable	*M*	*SD*	*Mdn*	*R*	*M*	*SD*	*Mdn*	*R*	*AM*	*ASE*
Co-teach Method (*n*=50)	317.36	12.07	320	47	336.26	12.18	336.00	50	338.61	1.29
Tradition Method *(n*=50)	325.32	5.34	327	21	337.02	7.97	336.00	35	334.67	1.29

Note. M = Mean; *SD* = Standard Deviation; *Mdn* = Median; R = Range; *AM* = Adjusted Mean; *ASE*= Adjusted Standard Error

Results

Assumptions

To ensure assumptions were met prior to conducting the analysis of covariance (ANCOVA), the researcher utilized SPSS 26 to conduct a Box and Whisker plot for both data sets to review for any extreme outliers. The data contained no extreme outliers as shown in Figure 1.

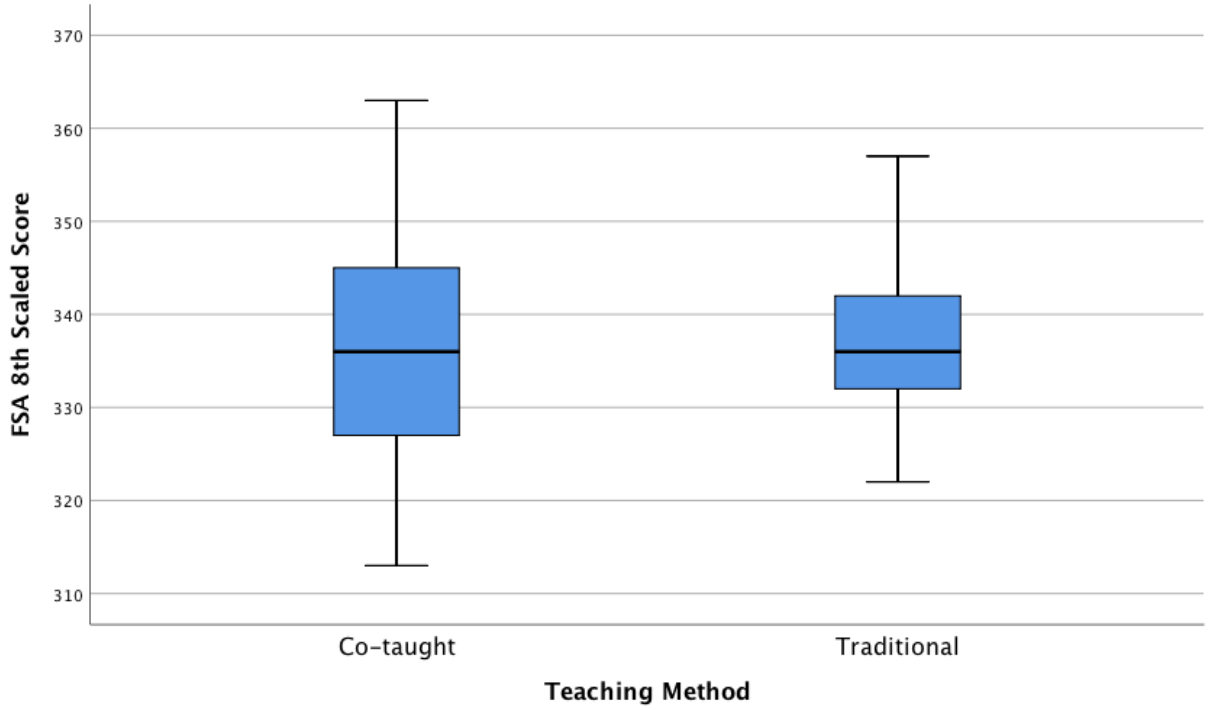

Figure 1. Initial box-and-whisker plot

To illustrate the assumption of normal distribution of scores, Figure 2 provides a histogram of the students' FSA-ELA Grade 8 scores from the co-taught methods, and Figure 3 provides a histogram of the students' FSA-ELA Grade 8 scores from the traditional methods. The histograms have a traditional *bell curve* to show what normal distribution of scores should be.

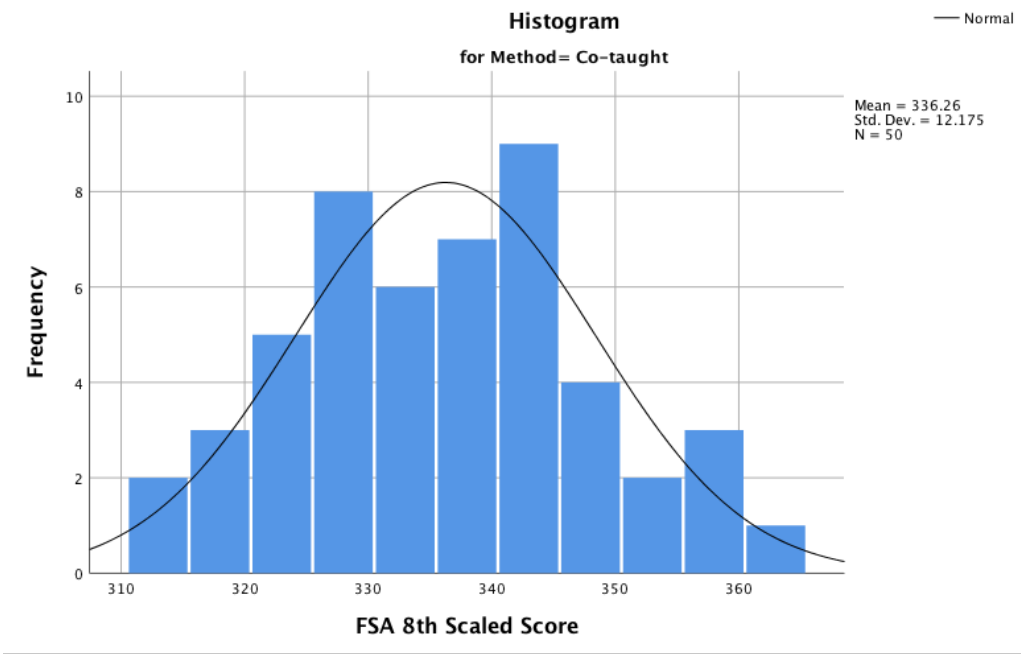

Figure 2. Histogram showing distribution of co-taught students' FSA-ELA Grade 8 scores.

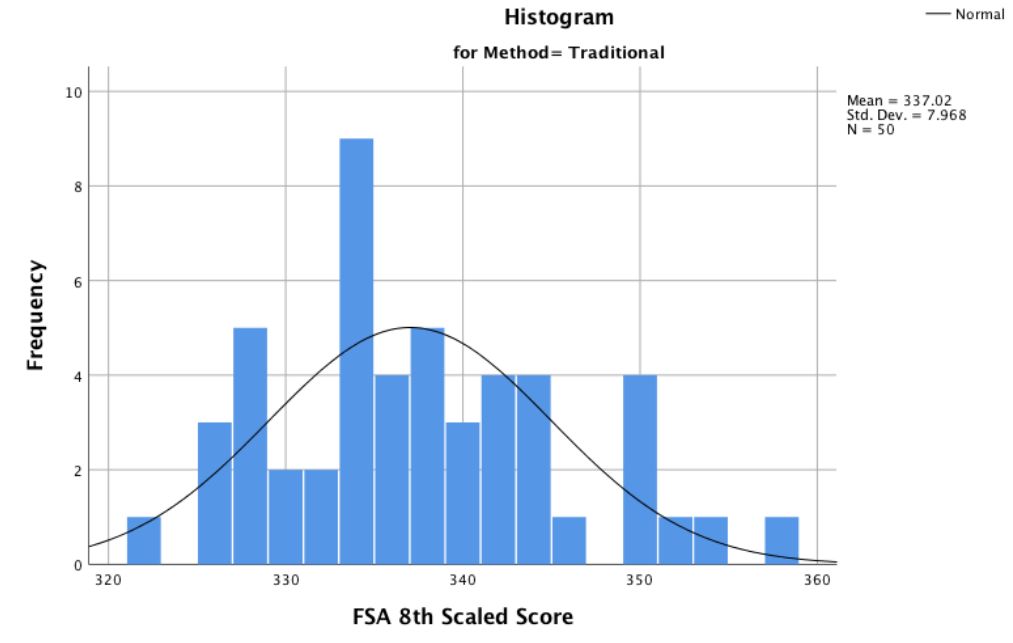

Figure 3. Histogram showing distribution of traditional class students' FSA-ELA Grade 8 scores.

The Kolmogorov-Smirnov test of normality was completed to assess the assumption of normal population distribution. The FSA Grade 8 scaled scores for both teaching methods does not deviate from normality as shown in Table 2.

Table 2

Kolmogorov-Smirnov Test of Normality

		Kolmogorov-Smirnov[a]		
	Teaching Method	Statistic	*df*	Sig.
FSA 8th	Co-taught	.085	50	.200*
S. Score	Traditional	.088	50	.200*

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

To meet the assumptions of linearity, bivariate normal distribution, and the homogeneity of slopes, the researcher developed Q-Q normal line plots for scores on the FSA-ELA 8 for each group of students. All three assumptions were tenable for both the co-taught method (Figure 4) and traditional method (Figure 5), as the data points lie on or near a diagonal line and are parallel.

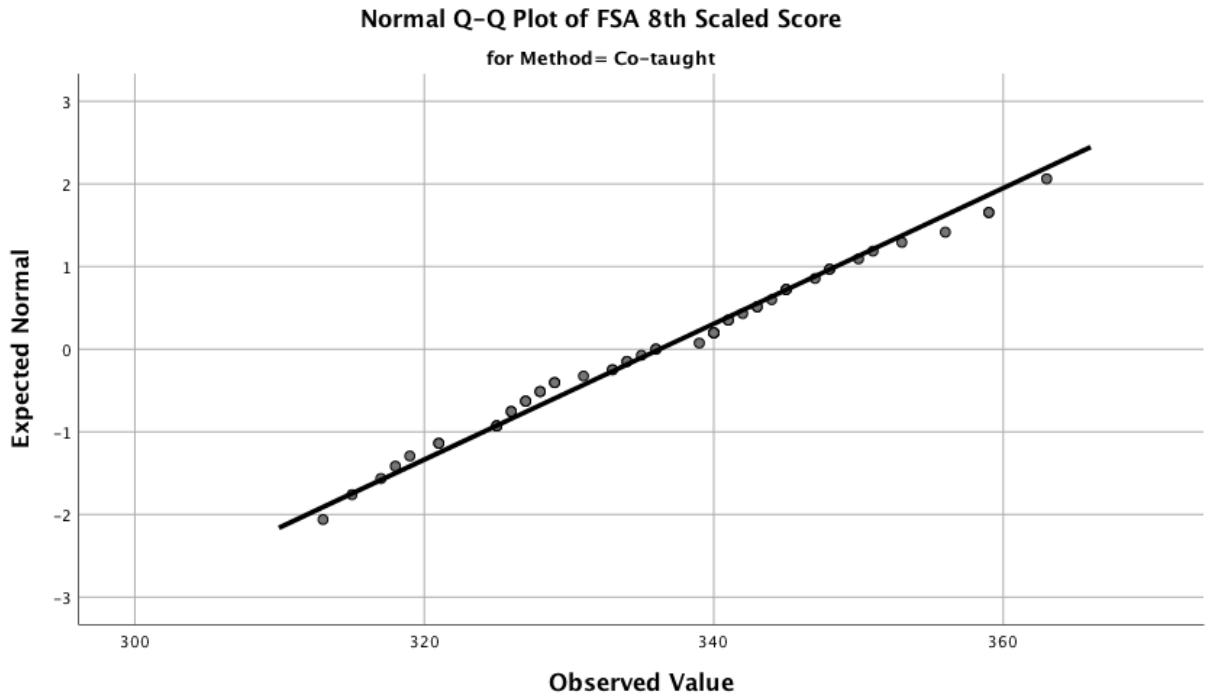

Figure 4. Q-Q Plot of FSA-ELA Grade 8 Scaled Scores for Co-taught Method

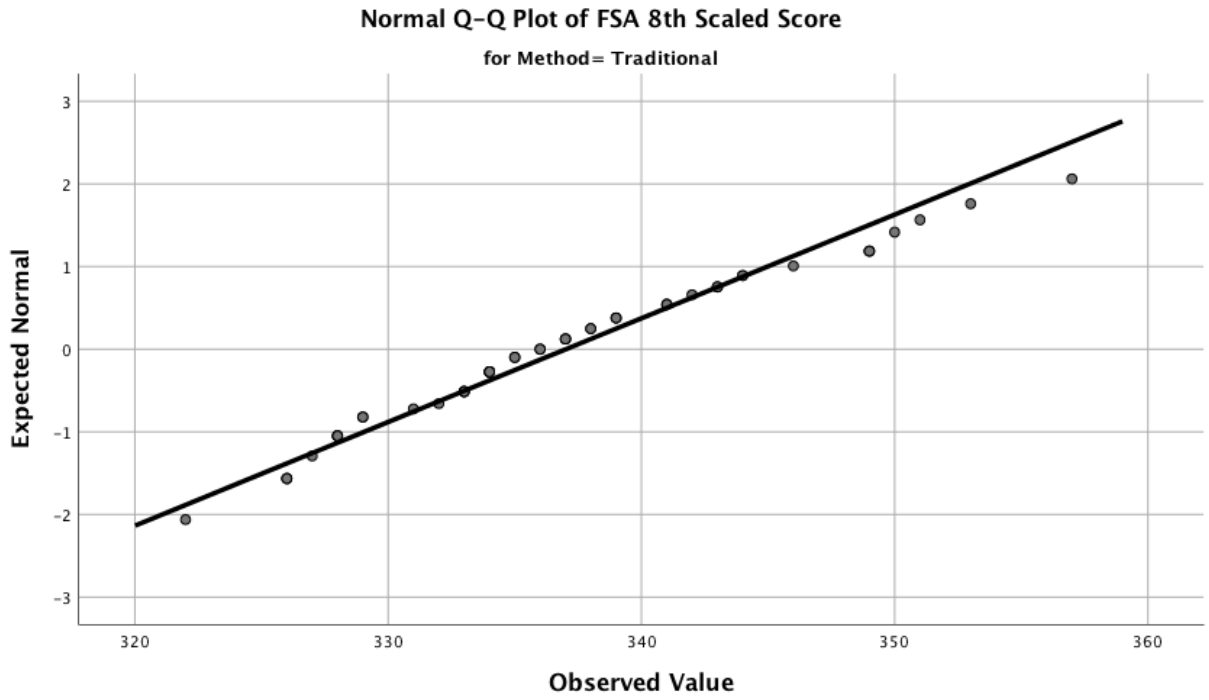

Figure 5. Q-Q Plot of FSA-ELA Grade 8 Scaled Scores for Traditional Method

The assumption of equal variances was met utilizing Levene's Test of Equality of Error Variances. The Levene's test for equality of variances was conducted and was not significant at the $p \leq .05$ level. The assumption of equal variances was met.

Table 3

Levene's Test of Equality of Error Variances

Dependent Variable: FSA 8th Scaled Score			
F	*df1*	*df2*	Sig.
2.017	1	98	.159

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + FSA7 + Method

Analysis

With all assumptions met, an ANCOVA was conducted to test the null hypothesis. The results of the ANCOVA provided that there is a statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores, $F(1, 115) = 4.294$, $p = .041$, and a small effect size, $\eta_p^2 = 0.04$. Therefore, the null hypothesis that there is no statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores was rejected. The ANCOVA results are located in Table 4 below.

Table 4

ANCOVA Results

Dependent Variable: FSA 8th Scaled Score

Source	Type II Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Corrected Model	2991.302[a]	2	1495.651	19.611	.000	.288
Intercept	2889.218	1	2889.218	37.884	.000	.281
FSA7	2976.862	1	2976.862	39.033	.000	.287
Method	327.449	1	327.449	4.294	.041	.042
Error	7397.738	97	76.265			
Total	11343038.000	100				
Corrected Total	10389.040	99				

a. R Squared = .288 (Adjusted R Squared = .273)

Estimated marginal means were conducted to account for the covariate FSA-ELA Grade 7 scaled scores. This adjustment is shown on Table 5.

Table 5

Estimated Marginal Means

Dependent Variable: FSA 8th Scaled Score

Teaching Method	Adjusted Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Co-taught	338.610[a]	1.291	336.048	341.173
Traditional	334.670[a]	1.291	332.107	337.232

a. Covariates appearing in the model are evaluated at the following values: FSA 7th Scaled Score = 321.34.

The estimated marginal means data revealed that the FSA-ELA Grade 8 scaled scores were higher for students in co-taught classes (M = 338.61, SE =1.29) compared to scores for students in traditional classes (M = 334.67, SE = 1.29) when controlling for the covariate FSA-ELA Grade 7.

Summary

Chapter Four provided an overview of the descriptive statistics, the assumptions met, and the analysis of data. The descriptive statistics included information on what methods were utilized, co-teaching or traditional methods, as well as the scaled scores on the Florida Standards Assessment - English Language Arts Grade 8 based off each method. Multiple assumptions were met to ensure the data analysis was valid. The data analysis using an analysis of covariance (ANCOVA) found that the independent variable of teaching method was a statistically significant predictor of scaled score on the FSA-ELA Grade 8 when controlling for the covariate FSA-ELA Grade 7 scaled scores. The researcher was able to reject the null hypothesis. Chapter Five will discuss these finding in detail along with the implications and recommendations for future research.

CHAPTER FIVE: CONCLUSIONS

Overview

Chapter Five will discuss the results of the statistical analysis, the implications of the research, the limitations of this study, and the recommendations for future research. This quantitative study was conducted to evaluate the effect co-teaching courses had on students' standardized scores on the Florida Standards Assessment - English Language Arts Grade 8 (FSA-ELA 8) compared to students in traditional classes while controlling for baseline scores on the Florida Standards Assessment - English Language Arts Grade 7 (FSA-ELA 7).

Discussion

The purpose of this quantitative, archival study was to determine if there is a significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores. The independent variable, co-teaching, was generally defined as when a general education teacher and special education teacher plan for, teach, and assess general education and special education students together as equal partners (Bauwens et al., 1989). The dependent variable, student achievement, was the scores on the state-mandated, high-stakes assessment known as the Florida Standards Assessment - English Language Arts Grade 8 (FSA-ELA 8).

The control variable, prior knowledge, was the students' scaled scores on the state-mandated, high-stakes assessment known as Florida Standards Assessment-English Language Arts Grade 7 (FSA-ELA 7). The control group consisted of eighth-grade students that are in traditional core academic courses that do not receive co-teaching instruction.

The research question, “Is there a difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic course while controlling for students’ baseline reading scores”, was addressed using an analysis of covariance (ANCOVA). The results of the ANCOVA provided that there is a statistically significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students’ baseline reading scores, $F(1, 115) = 4.294$, $p = .041$, and a small effect size, $\eta_p^2 = 0.04$.

The review of the literature indicated that co-teaching implementation had positive results when conducted for academic gains of standardized assessments. This study also offered support for the premise that co-teaching has a significant influence on students' state-assessment reading scores. The results of this study were consistent with the outcome of Bacharach et al. (2010) research utilizing co-teaching programs to increase students' scores on the Minnesota Comprehensive Assessment (MCA) and the research edition of the Woodcock-Johnson 111 (WJIII-RE). Students in that study who received co-teaching outperformed their peers in traditional classrooms through pre and post assessments. Bacharach et al. (2010) studied four years worth of data from K-6 students. Each year's worth of data concluded that while both the co-taught and traditional programs had increased mean gains in reading, the co-taught program had outperformed the traditional program each year. These findings coincide with this study, as both the co-taught and traditional groups had increased mean gains with the co-taught classes having higher gains.

Similar to Brusca-Vega et al. (2011), this research showed that the majority of both students with and without disabilities achieved higher mean increases in scores from their

previous baseline scores through the implementation of the co-teaching program. However, in this study, the students with disabilities in the traditional setting had a slightly higher mean increase in the FSA-ELA 8 scores (n = 6, 15.92) than students with disabilities in the co-teaching program (n = 13, 16.84) as reported in Appendix B, Table 10. These results contradict the findings of Rea et al. (2002), in which students with disabilities in the cooperative learning environment had significantly higher scores on the ITBS subtests in language and mathematics than their peers in a traditional setting. They also contradicted the findings of Tremblay (2013), Hang and Rabren (2009), and Murawski (2006), which all reported that students with disabilities had achieved higher outcomes on reading and writing scores in co-teaching classrooms compared to students in traditional special education classrooms. This information is limited in the fact that the co-teaching program sample had more than twice as many students with disabilities (n = 13) compared to the traditional program (n = 6). Thus, the findings based off special education status alone may be skewed, with further research needing to be conducted in this specific area.

While racial demographics were included in this study, they were not a primary focus of the research design. Interestingly, African American, Hispanic, Caucasian, and mixed race student populations had higher mean score increases in the co-teaching sample than from the traditional teaching sample as reported in Appendix B Table 7. African American students in the co-teaching program had three times higher mean increases in scores (n = 3, 17) than African American students in the traditional program (n = 3, 5.67). Hispanic students in the co-teaching program had a slightly higher increase in mean scores (n = 2, 12.5) than African American students in the traditional program (n = 13, 9.85); however, there were significantly more Hispanic students in the traditional group than co-teaching group. Caucasian students in the co-

teaching program had much higher mean increases in scores (n = 41, 19.37) than Caucasian students in the traditional program (n = 27, 12.48). Mixed race students in the co-teaching program had slightly higher mean increases in scores (n = 4, 18.75) than mixed race students in the traditional program (n = 6, 15.5). Due to the fact that only one Asian student was in the traditional group and none in the co-teaching group, there was no opportunity to review differences based off that racial demographic. Empirical data reviewing co-teaching programs' effect based off of race is scarce, and the researcher was unable to gather student outcome information based off of race from the previous quantitative studies.

Similarly, free or reduced lunch status provides an interesting insight. As reported in Appendix B, Table 9, students with free or reduced lunch in the co-teaching program had higher mean score increases (n = 21, 16.46) than students with free or reduced lunch in the traditional program (n = 20, 9.65). These findings coincide with the results of Bacharach et al. (2010), which found the co-teaching program's four-year cumulative Minnesota Comprehensive Assessment (MCA) student proficiency percentage was much higher than the traditional programs when accounting for students' free or reduced lunch status.

Student FSA-ELA 8 and FSA-ELA 7 scores based off of gender were reported in Appendix B, Table 8. Female students in the co-teaching program had higher mean increases in scores (n = 20, 18.85) than female students in the traditional program (n = 20, 12.35). Likewise, male students in the co-teaching program had higher mean increases in scores (n = 30, 18.85) than male students in the traditional program (n = 30, 11.37). Empirical data reviewing co-teaching programs' effect based off of gender is scarce, and the researcher was unable to gather student outcome information based off of gender from the previous quantitative studies reviewed in the literature.

Student FSA-ELA 7 scores from the co-teaching and traditional groups provide insight as to the baseline as each program was conducting its courses. Appendix B, Table 11, provides the FSA-ELA 7 levels. The co-teaching group started with 21 students at Level 1 and 29 students at Level 2, while the traditional group started with six students at Level 1 and 44 students at Level 2. Both levels are considered non-proficient, with proficiency beginning at Level 3 and mastery at Level 5. Reviewing the FSA-ELA 8 scores from both groups from Appendix B, Table 12, shows increases in mean scores for both the co-teaching and traditional groups. The co-taught student outcomes were as follows: seven students at Level 1, 19 students at Level 2, 19 students at Level 3, and five students at Level 4. The traditionally-taught student outcomes were as follows: zero at Level 1, 26 at Level 2, 22 at Level 3, and two at Level 4. Both groups finished with 48% of students going from non-proficiency to proficiency in the course of one academic year; however, students from the co-teaching group started with a mean scaled-score (M = 317.36) much lower than the traditional group (M = 325.32). This is why the baseline scores/covariate of FSA-ELA 7 were essential to this study.

Students in the state of Florida are required to achieve a satisfactory score on the Florida Standards Assessment - English Language Arts Grade 10 (FSA-ELA 10) to graduate with a high school diploma (Florida Department of Education, 2017a). In this study, both sets of students from the co-teaching and traditional groups went from 0% meeting the state requirements to 48% (n = 48) meeting the requirements at Level 3 or Level 4. These students' progress will most likely be monitored to ensure they do not become at-risk of failing as they approach the FSA-ELA 10.

Implications

This research contributes to the knowledge base of co-teaching implementation in public schools to increase academic achievement scores on high-stakes assessments. With at least 17 states still requiring students to achieve a satisfactory score on a reading high-stakes assessment (or an equivalent measurement) in order to graduate with a high school diploma (Education Commission of the States, 2016), it is important for educational stakeholders to review all avenues of approach in getting at-risk students prepared for these assessments.

The results of this study specifically show added benefit for general education students in co-taught programs, as they had the largest increases in scores. This assists with the skepticism that general education students may be encumbered by participating in a co-taught program along with students in special education programs. The study also supports Vygotsky's (1978) social development theory that more social interactions with teachers and other students through the strategies of team-teaching, small group instruction, scaffolding, and differentiated instruction can increase skill development and enhances student knowledge (Beninghof, 2012).

This study provides empirical data to enhance the development and sustainment of co-teaching programs across the United States. While this study is limited in its scope, it shows that there was a statistically significant difference between reading assessment scores among students in a co-teaching core academic course and students in a traditional core academic course while controlling for students' baseline reading scores. This study added to the limited, current research available on co-teachings' effect on students' high-stakes assessment scores, in which more research is needed to determine co-teachings' effectiveness across all subject areas and grade levels.

Limitations

All of the study participants were from one suburban school district in the Florida Panhandle. The study provided results from two schools within the district, with one school providing co-teaching and the other school providing traditional methods. The study was limited to a random convenience sample from these two schools. Both samples had a majority of students who identified as Caucasian, with smaller populations of students who identified as Hispanic, African American, Asian, mixed, and other race. It is important to note there may be cultural differences that could attribute to assessment scores (Ahsan & Smith, 2016), and this study may not be generalizable to more diverse or homogeneous student populations or student populations in different areas of the United States. Also, the populations of students with disabilities were different in the two convenience samples. The co-teaching sample had twice as many students with disabilities than the traditional sample, and specific information of what disabilities students within the samples had been diagnosed with was withheld to protect students' personal, identifiable information.

The state-standardized assessments, the Florida Standards Assessment - English Language Arts 7 and 8, were utilized for this study. Therefore, this study may only be generalizable to schools and districts that utilize these assessments. This study did not focus on qualitative data such as interviews, observations, and classroom materials. The data was collected postfacto from archival data from the 2016-2017 and 2017-2018 academic years. Therefore, the strategies utilized by the educators from the control and treatment group cannot be discussed in detail.

Recommendations for Future Research

Co-teaching has been utilized in many states and districts in one form or another. With the continuing implementation of high-stakes, state-standardized assessments as a requirement for graduation, more research is needed to determine how co-teaching methods can continue to fit the needs of future learners. The following recommendations could provide useful insight for future research.

1. This study was limited to two schools in a suburban school district in the Florida Panhandle with a small population of students who participated in a co-teaching program. Research that includes larger and more diversified populations from multiple areas of the United States is needed.
2. Social science was the course in which co-taught students received content-area reading strategies and other co-teaching methods. More research is needed in other subject areas to see if implementation in those areas can increase reading scores as well as other state-assessed content. While co-teaching research has been done in multiple subject areas, most of the research has become dated as technology has changed the course of K-12 education.
3. The instruments utilized in this study were the Florida Standards Assessment - English Language Arts 7 and 8. Additional research should focus on using valid and reliable assessment instruments such as state-standardized and nationally-standardized assessments.
4. The co-teaching arrangements in this study were the most common, which is the pairing of one core-content area teacher and a special education teacher. Some different co-

teaching arrangements, such as two general education teachers or one general educator and one paraprofessional, should be researched to review effectiveness as well.

5. One of the main goals of co-teaching is to provide more focused instruction with students who may need extra scaffolding within the zone of proximal development. Students with disabilities are normally a large focus in co-teaching programs; however, more research on the effectiveness of co-teaching for students at risk of failing, who are without disabilities, should be conducted.
6. While demographic data was presented and reviewed, it was not a major factor of this study. More research should be conducted to review whether race, gender, free/reduced lunch status, special education status, and/or other pertinent demographical data correlates to the effectiveness of co-teaching.
7. Follow-up data on students' standardized assessment scores for the next few years after the study would be extremely beneficial. With a Level 3 on the FSA ELA Grade 10 being necessary for these samples, it would be interesting to see the results in a longitudinal research study.

Summary

Chapter Five reviewed the results of the study in regards to the research question and null hypothesis. The null hypothesis was rejected, and there was a significant difference between Florida Standards Assessment reading scores among students in a co-teaching core academic course and students in traditional core academic courses while controlling for students' baseline reading scores. The increases in scores in both the control and treatment groups were examined, as well as the implications of this study discussed. The limitations of this study were considered, including that the study contained only two middle schools from the same district

and one school had a slightly higher sample of students that identified as Hispanic. In conclusion, recommendations for future research related to the study of co-teaching methods were suggested.

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APPENDICES

Appendix A: IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

August 15, 2019

William Taylor
IRB Application 3945: The Effect of Co-Teaching on Student Reading Achievement Scores

Dear William Taylor,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because it will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at irb@liberty.edu.

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

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Appendix B: Demographic Breakdowns of FSA Scores

Table 6

FSA Scores and Race

Race	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
African American	Co-taught	Mean	323.33	306.33
		N	3	3
		Std. Deviation	4.726	11.547
		Range	9	20
		Minimum	318	293
		Maximum	327	313
	Traditional	Mean	331.67	326.00
		N	3	3
		Std. Deviation	5.132	4.359
		Range	10	8
		Minimum	326	323
		Maximum	336	331
	Total	Mean	327.50	316.17
		N	6	6
		Std. Deviation	6.348	13.303
		Range	18	38
		Minimum	318	293
		Maximum	336	331
Asian	Traditional	Mean	335.00	325.00
		N	1	1
		Std. Deviation	.	.
		Range	0	0
		Minimum	335	325
		Maximum	335	325
	Total	Mean	335.00	325.00
		N	1	1
		Std. Deviation	.	.
		Range	0	0
		Minimum	335	325

Maximum	335	325

Hispanic	Co-taught	Mean	336.00	323.50
		N	2	2
		Std. Deviation	15.556	4.950
		Range	22	7
		Minimum	325	320
		Maximum	347	327
	Traditional	Mean	336.00	326.15
		N	13	13
		Std. Deviation	6.055	5.383
		Range	21	19
		Minimum	328	312
		Maximum	349	331
	Total	Mean	336.00	325.80
		N	15	15
		Std. Deviation	6.980	5.240
		Range	24	19
		Minimum	325	312
		Maximum	349	331
Caucasian	Co-taught	Mean	336.71	317.34
		N	41	41
		Std. Deviation	11.858	12.435
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	336.81	324.33
		N	27	27
		Std. Deviation	8.385	5.724
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.75	320.12
		N	68	68
		Std. Deviation	10.547	10.813
		Range	50	47
		Minimum	313	285

Maximum	363	332

Mixed Race	Co-taught	Mean	341.50	322.75
		N	4	4
		Std. Deviation	15.631	6.021
		Range	38	14
		Minimum	321	317
		Maximum	359	331
	Traditional	Mean	343.17	327.67
		N	6	6
		Std. Deviation	9.579	4.179
		Range	27	11
		Minimum	326	320
		Maximum	353	331
	Total	Mean	342.50	325.70
		N	10	10
		Std. Deviation	11.540	5.314
		Range	38	14
		Minimum	321	317
		Maximum	359	331
Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285

Maximum	363	332

Table 7

FSA Scores and Gender

Gender	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
Female	Co-taught	Mean	333.75	314.90
		N	20	20
		Std. Deviation	12.013	9.193
		Range	50	34
		Minimum	313	293
		Maximum	363	327
	Traditional	Mean	337.35	325.00
		N	20	20
		Std. Deviation	8.197	4.679
		Range	29	17
		Minimum	328	315
		Maximum	357	332
	Total	Mean	335.55	319.95
		N	40	40
		Std. Deviation	10.313	8.832
		Range	50	39
		Minimum	313	293
		Maximum	363	332
Male	Co-taught	Mean	337.93	319.00
		N	30	30
		Std. Deviation	12.194	13.562
		Range	44	47
		Minimum	315	285
		Maximum	359	332
	Traditional	Mean	336.80	325.53
		N	30	30
		Std. Deviation	7.946	5.800
		Range	31	21
		Minimum	322	311
		Maximum	353	332
	Total	Mean	337.37	322.27

		N	60	60
		Std. Deviation	10.220	10.853
		Range	44	47
		Minimum	315	285
		Maximum	359	332
Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285
		Maximum	363	332

Table 8

FSA Scores and Free/Reduced Lunch Status

FRL Status	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
Free or Reduced Price	Co-taught	Mean	331.67	315.14
		N	21	21
		Std. Deviation	10.307	11.217
		Range	35	46
		Minimum	313	285
		Maximum	348	331
	Traditional	Mean	335.55	325.90
		N	20	20
		Std. Deviation	7.112	5.562
		Range	28	21
		Minimum	322	311
		Maximum	350	332
	Total	Mean	333.56	320.39
		N	41	41
		Std. Deviation	9.000	10.356
		Range	37	47
		Minimum	313	285
		Maximum	350	332
Regular Price	Co-taught	Mean	339.59	318.97
		N	29	29
		Std. Deviation	12.500	12.602
		Range	48	44
		Minimum	315	288
		Maximum	363	332
	Traditional	Mean	338.00	324.93
		N	30	30
		Std. Deviation	8.465	5.239
		Range	31	19
		Minimum	326	312
		Maximum	357	331
	Total	Mean	338.78	322.00

		N	59	59
		Std. Deviation	10.578	9.972
		Range	48	44
		Minimum	315	288
		Maximum	363	332
Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285
		Maximum	363	332

Table 9

FSA Scores and Special Education Status

Special Education Status	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
Student with Disabilities	Co-taught	Mean	326.15	310.23
		N	13	13
		Std. Deviation	10.519	16.156
		Range	32	47
		Minimum	313	285
		Maximum	345	332
	Traditional	Mean	337.17	320.33
		N	6	6
		Std. Deviation	6.585	7.312
		Range	18	19
		Minimum	326	312
		Maximum	344	331
	Total	Mean	329.63	313.42
		N	19	19
		Std. Deviation	10.652	14.565
		Range	32	47
		Minimum	313	285
		Maximum	345	332
Student without Disabilities	Co-taught	Mean	339.81	319.86
		N	37	37
		Std. Deviation	10.726	9.304
		Range	42	35
		Minimum	321	297
		Maximum	363	332
	Traditional	Mean	337.00	326.00
		N	44	44
		Std. Deviation	8.204	4.720
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	338.28	323.20

		N	81	81
		Std. Deviation	9.483	7.771
		Range	42	35
		Minimum	321	297
		Maximum	363	332
Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285
		Maximum	363	332

Table 10

FSA Scores Review based off of previous Level

FSA 7 LEVEL	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
1	Co-taught	Mean	327.43	306.10
		N	21	21
		Std. Deviation	8.925	9.838
		Range	30	32
		Minimum	313	285
		Maximum	343	317
	Traditional	Mean	337.83	314.83
		N	6	6
		Std. Deviation	7.834	2.714
		Range	23	6
		Minimum	326	311
		Maximum	349	317
	Total	Mean	329.74	308.04
		N	27	27
		Std. Deviation	9.618	9.464
		Range	36	32
		Minimum	313	285
		Maximum	349	317
2	Co-taught	Mean	342.66	325.52
		N	29	29
		Std. Deviation	10.083	4.672
		Range	38	14
		Minimum	325	318
		Maximum	363	332
	Traditional	Mean	336.91	326.75
		N	44	44
		Std. Deviation	8.069	3.761
		Range	35	14
		Minimum	322	318
		Maximum	357	332
	Total	Mean	339.19	326.26

		N	73	73
		Std. Deviation	9.297	4.160
		Range	41	14
		Minimum	322	318
		Maximum	363	332
Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285
		Maximum	363	332

Table 11

FSA Scores Review based off of current Level

FSA 8 LEVEL	Teaching Method		FSA 8th Scaled Score	FSA 7th Scaled Score
1	Co-taught	Mean	317.71	299.00
		N	7	7
		Std. Deviation	2.984	12.069
		Range	8	32
		Minimum	313	285
		Maximum	321	317
	Total	Mean	317.71	299.00
		N	7	7
		Std. Deviation	2.984	12.069
		Range	8	32
		Minimum	313	285
		Maximum	321	317
2	Co-taught	Mean	329.84	316.42
		N	19	19
		Std. Deviation	3.962	10.849
		Range	11	34
		Minimum	325	297
		Maximum	336	331
	Traditional	Mean	330.92	324.77
		N	26	26
		Std. Deviation	3.794	5.256
		Range	14	21
		Minimum	322	311
		Maximum	336	332
	Total	Mean	330.47	321.24
		N	45	45
		Std. Deviation	3.859	9.013
		Range	14	35
		Minimum	322	297
		Maximum	336	332
3	Co-taught	Mean	343.79	323.00

		N	19	19
		Std. Deviation	3.660	6.191
		Range	12	21
		Minimum	339	311
		Maximum	351	332
	Traditional	Mean	342.59	325.64
		N	22	22
		Std. Deviation	4.615	5.602
		Range	14	20
		Minimum	337	312
		Maximum	351	332
	Total	Mean	343.15	324.41
		N	41	41
		Std. Deviation	4.193	5.958
		Range	14	21
		Minimum	337	311
		Maximum	351	332
4	Co-taught	Mean	358.00	325.20
		N	5	5
		Std. Deviation	3.742	6.535
		Range	10	14
		Minimum	353	318
		Maximum	363	332
	Traditional	Mean	355.00	329.00
		N	2	2
		Std. Deviation	2.828	2.828
		Range	4	4
		Minimum	353	327
		Maximum	357	331
	Total	Mean	357.14	326.29
		N	7	7
		Std. Deviation	3.579	5.765
		Range	10	14
		Minimum	353	318
		Maximum	363	332

Total	Co-taught	Mean	336.26	317.36
		N	50	50
		Std. Deviation	12.175	12.073
		Range	50	47
		Minimum	313	285
		Maximum	363	332
	Traditional	Mean	337.02	325.32
		N	50	50
		Std. Deviation	7.968	5.335
		Range	35	21
		Minimum	322	311
		Maximum	357	332
	Total	Mean	336.64	321.34
		N	100	100
		Std. Deviation	10.244	10.111
		Range	50	47
		Minimum	313	285
		Maximum	363	332