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The Effect of a Constructivist-Based Approach on Fifth Grade Reading Achievement

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Lori Harkness

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2016

Abstract

The Effect of a Constructivist-Based Approach on Fifth Grade Reading Achievement

by

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MA, Stephen F. Austin State University, 1998

BS, Stephen F. Austin State University, 1995

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

June 2016

Abstract

The problem investigated in this quantitative study was that schools in a small, rural East Texas town were falling below acceptable ratings in reading on the Texas Assessment of Knowledge and Skills (TAKS) and the State of Texas Assessment of Academic Readiness (STAAR). Researchers have found that constructive-based learning environments (CBLEs) can improve student achievement. The purpose of this study was to examine the relationship between length of time enrolled in a CBLE and reading achievement. Based on the framework of constructivism, 2 research questions were examined. To answer Research Question 1, an analysis of covariance (ANCOVA) calculated the difference in reading achievement as measured by the TAKS in 2011 and the STAAR in 2015, between 5th grade students ($N = 81$) enrolled in a CBLE for more than 2 years (Group 1) and students enrolled in a CBLE for less than 1 year (Group 2) when adjusted for 4th grade scores. Results showed that Group 1 students demonstrated higher adjusted mean reading scores than Group 2 students on TAKS with $F(1, 32) = 15.374, p < .001$ and on STAAR with $F(2, 42) = 9.427, p < .001$. To answer Research Question 2, an independent-samples t test compared the means of the reading scores growth from 4th to 5th grade. The result showed no significant difference in TAKS with $t = .607, p = .548$ and in STAAR with $t = .277, p = .783$. America's reliance on standardized tests influences the way in which reading is taught. Examining standardized reading test outcomes may indicate how teaching and learning environments affect student success. This information may lead to positive social change as educators examine teaching and testing goals, ultimately contributing to student success on standardized tests.

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Dedication

To my mother who has been my strongest supporter and loudest cheerleader in everything that I do, and my daddy who always said one day “I’d run this place”. Thank you for all of your love, support, and encouragement.

To my husband who stands beside me and often holds me up. Thank you for your love, support, and loyalty.

To my children Christopher, Chandler, Hannah Grace, John, and Halle as you are my entire world.

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Section 1: Introduction to the Study

Educators have emphasized the importance of constructivist philosophy and educational practice in students' and young children's achievement (McCombs & Miller, 2007; Waite-Stupiansky, 1997). Constructivism is a learning theory that encourages teachers to recognize that learning is constructed out of individual, exploratory actions within the environment (Wadsworth, 1996). It suggests that learning is connected to a learner's prior experiences; interactions; and internal, personalized expansion of knowledge (Tracey & Morrow, 2012; Wright, 2008).

Schools in a small, rural East Texas community were falling below acceptable ratings in reading on standardized tests, as measured by the Texas Assessment of Knowledge and Skills (TAKS) that was administered until 2011, and the State of Texas Assessment of Academic Readiness (STAAR) administered thereafter. The university charter school that was the subject of this study adopted a constructivist-based learning environment (CBLE). *Constructivism*, a term coined by Piaget to describe his learning theory, refers to the process of building on one's prior knowledge and the change in thinking that occurs as new information is processed (Tracey & Morrow, 2012; Waite-Stupiansky, 1997). In a CBLE, the traditional teaching practice of drill-and-skill memorization is replaced with questions, trial-and-error, conversations, and reaching conclusions.

Problem Statement

This study investigated the problem that schools in a small rural East Texas community fell below acceptable ratings on the TAKS and the STAAR tests in reading (see Table 1 for fifth grade reading TAKS/STAAR pass rate percentages).

Table 1

Fifth Grade Reading TAKS/STAAR Pass Rate Percentages

Test	Year	State percent	District percent
TAKS	2010-2011	87	72
STAAR	2011-2012	77	58
STAAR	2012-2013	77	60
STAAR	2013-2014	76	57
STAAR	2014-2015	78	55

There is a consistent trend of underachievement in fifth grade test scores in reading in the state of Texas. The research study was designed to examine the relationship between the length of time enrolled in the CBLE and reading achievement and to determine the growth in reading achievement, as measured by the TAKS and STAAR tests, of fifth grade students enrolled in the CBLE for more than 2 years compared to students enrolled in the CBLE for less than 1 year. It also explored the possibility that students enrolled in this CBLE experienced greater growth in reading achievement from fourth to fifth grade, as measured by the TAKS and STAAR, than students enrolled in the CBLE for less than 1 year. This study may help strengthen the

educational system as a whole and may promote a more developmentally appropriate curriculum for children.

Background of Study

This study took place in a local school district in a small, rural East Texas town where the public school system used traditional teaching practices in the form of district-developed curriculum guides and the adoption of Reading First (Hagan, 2014), a federal education program mandated under the No Child Left Behind Act. A traditional learning environment (TLE) implements direct instruction, is frequently based on behavior modification through classical and operant conditioning, and is grounded in external, rather than intrinsic, motivation. The goal of traditional instruction is to teach the learner new knowledge and skills through direct instruction. This approach focuses on mastering content in preparation for the next school level (McCombs & Miller, 2007; Nie & Lau, 2010). Klahr and Nigam (2004) attempted to demonstrate how direct instruction is a more effective means of learning than the constructivist approach. Direct instruction emphasizes structure and repetition of content, based on well-developed and carefully planned lessons designed around small learning increments and clearly defined and prescribed teaching tasks (Engelmann, 2004; Taber, 2010). The Reading First curriculum used during the years prior to this study was a state-funded program created to encourage the use of scientifically based research as the foundation for reading instruction for children in kindergarten through third grade (Hagan, 2014). The program's goal was to have each child reading at or above grade level by the end of third grade. Reading First is

a direct instruction model with a prescribed program that dictates instruction, order of content, and timed activities.

Despite the use of this prescriptive program, the local school district's reading scores remained low (Texas Education Agency [TEA], 2010a). Literature on low-performing schools suggests that possible factors impeding success include teacher experience and training (Ascher & Fruchter, 2001; Barnyak & Paquette, 2010), differing philosophies of teaching and learning (Witcher, Sewall, Arnold, & Travers, 2001), and administrative support for ongoing staff development in successful teaching strategies (Duke, 2006, 2007).

In contrast to a TLE, the university-based charter school, which draws students from the same population as the local school district, emphasizes a CBLE that guides instructional decisions, as reflected in the charter school's mission statement: "The mission of this charter school is to create a learning environment that provides a model curriculum and supports student development of autonomy, openness, problem solving, and integrity through a learning centers and inquiry based curriculum" (Stephen F. Austin State University [SFASU], 2016).

This charter school is an educational center located in a university setting, in which teachers with master's degrees in early childhood education or elementary education instruct students in kindergarten through fifth grade. These classrooms provide field-experience settings for undergraduate and graduate education students. The school is based on twin goals of improving public education and enhancing educator preparation.

According to its handbook, this university charter school creates a learning environment that provides a research-based model curriculum through a constructivist inquiry-based curriculum (SFA, 2016). In a position statement from the National Association for the Education of Young Children on developmentally appropriate practice (DAP) in early childhood programs, Copple and Bredekamp (2009) present, “a review of the literature on early childhood education generates a set of principles to inform early childhood practice” (p. 10). These principles guide decisions about DAP and inform practice. This university charter school addresses these principles and child-centered learning by using small- and whole-group discussions, conferring with each child, and conducting content-area workshops on a daily basis. In addition, the university charter school develops discovery learning through the use of specific, well-defined areas of learning called *learning centers* (Bullard, 2010).

Nature of Study

This study was quasi-experimental, using a nonequivalent control group design in which existing test results from the CBLE university charter school were examined to determine whether differences existed between children’s reading test scores based upon the length of their exposure in the CBLE. The State of Texas mandates annual administration of standardized reading tests for the purpose of noting student success on state standards. Scores for students at the CBLE were analyzed by comparing achievement between fifth grade students enrolled for more than 2 years and less than 1 year. University charter school enrollment was based on an equal-opportunity lottery system. Students enrolled in the CBLE came from within the school district boundaries.

The CBLE included two classrooms of each grade level. Newly enrolled students were randomly selected from a large pool of potential applicants and equally divided between two grade-level classrooms.

Research Questions and Hypotheses

The following research questions and hypotheses guided this study:

Research Question 1: What is the difference in reading test scores as measured by the TAKS in 2011, and by the STAAR in 2015, between fifth grade students who have been enrolled in the CBLE for more than 2 years and fifth grade students who have been enrolled for less than 1 year, while controlling for previous reading levels by the fourth grade test scores?

H₀1: After controlling for fourth grade achievement, there is no significant difference in the TAKS or the STAAR reading scores between fifth grade students who have been enrolled in a CBLE for more than 2 years and students who have been enrolled for less than 1 year.

H₁1: After controlling for fourth grade reading test scores, there is a significant difference in the TAKS or the STAAR reading scores between fifth grade students who have been enrolled in a CBLE for more than 2 years and students who have been enrolled for less than 1 year.

Research Question 2: What is the difference in the growth of reading test scores from fourth to fifth grade as measured by the TAKS in 2011, and by the STAAR in 2015, between students who have been enrolled in the CBLE for more than 2 years and students who have been enrolled for less than 1 year?

H₀1: There is no significant difference in growth in the TAKS or the STAAR reading scores from fourth to fifth grades between students enrolled in the CBLE for more than 2 years and students who have been enrolled for less than 1 year.

H₁1: There is a significant difference in growth in the TAKS or the STAAR reading scores from fourth to fifth grades between students enrolled in the CBLE for more than 2 years and students who have been enrolled for less than 1 year.

For Research Question 1, an analysis of covariance (ANCOVA) procedure tested for significant differences between the fifth grade TAKS and STAAR reading scores of students enrolled in the CBLE for more than 2 years and students enrolled in the CBLE for less than 1 year. The dependent variable was fifth grade reading; the independent variable was time enrolled in CBLE with two levels: more than 2 years and less than 1 year. To account for differences that might occur prior to beginning the study, students' fourth grade scores on the TAKS or the STAAR test were used as the covariate in the ANCOVA analyses.

For Research Question 2, the independent-samples test (the *t* test) procedure examined growth in reading achievement from fourth grade to fifth grade of students enrolled in the CBLE for more than 2 years compared to scores of students enrolled in the CBLE for less than 1 year. The dependent variable was growth in reading test scores between fourth and fifth grade. The independent variable was time enrolled in the CBLE for more than 2 years and less than 1 year. This analysis allowed me to compare 1 year growth of test scores between the two groups.

Purpose of the Study

The purpose of this study was to examine the relationship between the length of time enrolled in a CBLE and reading achievement, specifically growth in reading achievement, as measured by the TAKS and by the STAAR tests, of fifth grade students enrolled in the CBLE for more than 2 years compared to students enrolled in the CBLE for less than 1 year.

All students in this study attended the CBLE university charter school for their fifth grade year. In approximately one-half of the sample group, their first year to attend the CBLE was their fifth grade year; the remainder of the sample attended the CBLE for over 2 years. Fourth and fifth grade TAKS and STAAR test reading scores for the sample populations were used to answer the research questions.

Theoretical Framework

The constructivist philosophy of teaching and learning served as the theoretical framework for this study. The constructivist view of teaching and learning places the teacher in the role of a facilitator and the child at the center of the curriculum (Garcia, Pearson, Taylor, Bauer, & Stahl, 2011; Richardson, 1997). The constructivist belief is that children learn by doing and construct their own knowledge through experiences in the environment (Richardson, 1997). There is not a prescribed curriculum in which one single approach is believed to work with all children; instead, learner-centered strategies inspire students' natural motivation for lifelong learning and encourage them to attain their highest possible achievement levels (Kalpana, 2014; Richardson, 1997).

In 1993, researchers from Vanderbilt University, the University of California-Berkeley, and the Ontario Institute for Studies in Education investigated teaching methods based on the idea that learners construct their own knowledge. Comparing student achievement, researchers found that students in a CBLE scored as well as or significantly better than students in a TLE (Secules, Cotton, Bray, & Miller, 1997). Two constructivist math classes were compared to four traditional math classes in a 2002 research study. Results indicated that students in the constructivist classroom demonstrated higher achievement than students not in a constructivist classroom (Marlowe & Page, 2005).

Success on state-mandated standardized tests is essential to the educational accountability system (No Child Left Behind [NCLB], 2002; TEA, 2010a). The primary goal of constructivism is that students connect their learning to prior ideas, experiences, and knowledge and create new understanding (D'Angelo, Touchman, & Clark, 2009). Revised state tests are structured to assess critical thinking skills. This type of testing more closely aligns with the CBLE. Research is needed on the topic of standardized test outcomes from CBLE and TLE at the local charter school.

Operational Definitions

For a better understanding of this research study, the following definitions and clarifications are provided:

Achievement is measured as each student's individual reading score on the state-mandated achievement test, TAKS or STAAR (TEA, 2012).

Constructivism is the belief that learners construct their own understanding and knowledge of the world through their experiences and reflecting on those experiences. For the purposes of this research, the philosophy of constructivism indicates that when one encounters something new, one must reconcile it with previous ideas and experiences, possibly changing what one believes or even discarding the new information as irrelevant (Richardson, 1997).

Learning is the assorted cognitive, metacognitive, affective, motivational, and social processes that support learning (McCombs & Miller, 2007).

Learner-centered refers to a perspective that combines a focus on individual learners' heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs with a concentration on the best available knowledge about how learning occurs. It includes teaching practices that promote the highest levels of motivation, knowledge, and achievement for all learners. This dual attention informs and drives educational decision making (McCombs & Whisler, 1997).

Traditionalism is the belief that the teacher is the transmitter of knowledge. For the purposes of this research, traditionalism occurs when a curriculum begins with parts of the whole and emphasizes basic skills. Strict adherence to the fixed curriculum is highly valued. Learning is primarily based on memorization and repetition; assessment is through testing. Knowledge is seen as inert; students primarily work alone (Richardson, 1997).

Assumptions, Limitations, Scope, and Delimitations

Five assumptions were made during this investigation. First, it was assumed that information collected from school records, such as standardized test scores, was complete, accurate, valid, and reliable. Second, observations were independent; each child's test scores were uncorrelated with others'. Third, the residuals of the data were normally distributed. Fourth, the variances between the groups were homogeneous. Last, the teachers in the CBLE university charter school taught with constructivist theory.

Using the threats to validity as outlined by Shadish, Cook, and Campbell (2002), limitations should also be considered. First, research findings might be limited by the unreliable treatment of implementation, given that teachers in the CBLE were not individually interviewed to determine if their teaching styles lent themselves to the constructivist approach. Second, although district curriculum materials and other publically available data indicated a strong traditional approach to learning, it is not clear to what extent the students' previous experiences represented a TLE, as this was not measured in the current study. Third, it is not known to what extent other variables, such as funding discrepancies, school culture, or physical environments between the two settings, may have also influenced the differences in scores. Fourth, due to a primary interest in selective variables, systematic differences outside the scope of this research may have existed (family involvement, family structure, or parental educational backgrounds) between the students who were enrolled in the CBLE for more than 2 years and students who had less than 1 year of experience. Fifth, this research involved the use of two instruments to measure reading achievement, the TAKS and the STAAR reading

tests for the appropriate year. The TAKS and the STAAR tests may not fully measure student reading achievement; other achievement measures may produce different results. Lastly, this limitation related to the close ties I had with the school; this could present a possible bias in constructing the research questions and formulating data interpretations. However, as the data are quantitative in nature, this limits bias in data analyses.

The scope of the study was constrained to the test scores of students who attended the CBLE university charter school. This study was delimited to one CBLE university charter school in East Texas. Data used in this study were from the TAKS reading examinations for the 2010-2011 academic year and the STAAR reading examinations for the 2014-2015 academic year. I used the TAKS and the STAAR reading data provided by the university charter school to measure student performance and excluded other student performance assessments. *t* test for differences was used to estimate the significance of the difference between the two groups in this study. This creates the delimitation that statistical regression to the mean may impact Research Question 2.

Significance of Study

Comparing standardized test scores for learners in the CBLE for more than 2 years and learners in the CBLE for less than 1 year provides educators with evidence for discussions of how to improve reading achievement. For example, examining the differences in TAKS and STAAR reading test scores of students who had only 1 year in the CBLE and comparing them to TAKS and STAAR reading test scores of students who had 2 or more years of prior experience in the CBLE may reveal differences and possible contributing factors that affected student success. Documenting those findings may lead

to further debate and questioning of the most effective teaching philosophies. This may contribute to positive social change, potentially transforming how educators look at teaching. Further research is necessary to demonstrate how environment and teaching philosophy impact children's learning as measured by standardized student achievement scores. If indeed teaching philosophy impacts standardized test scores, changing teaching philosophies can enable children to be more successful on standardized tests. These implications may strengthen the educational system as a whole and promote a more developmentally appropriate curriculum for children.

This research has the potential to help practitioners, administrators, policy makers, and researchers work to improve academic achievement by encouraging better teaching methods and informing contextual questions surrounding education.

Summary

In current literature on educational learning environments, there is noted controversy on how children learn best and what the best mode of instruction is (McCombs & Miller, 2007; Pressley & Allington, 2014; Richardson, 2007; Samuels & Farstrup, 2011). When incorporating instruction shown to create autonomous, supportive learning environments, one assumes that learners seasoned in a CBLE will demonstrate greater success on benchmarked, standardized achievement tests than less experienced CBLE learners. The literature review section summarizes research that informed this study.

Section 2: Literature Review

Social activities and interactions are critical to the learning process. This review of the literature concentrated on the constructivist approach to teaching and learning. Dewey stated, “the true center of correlation on the school subjects is not science, nor literature, nor history, nor geography, but the child’s own social activities” (as cited in Flinders & Thornton, 2004, p. 20). The literature review included the following research tools: books, educational databases, journal articles, online resources, and websites. Specific terms investigated were *constructivist/constructivism*, *learning centers*, *discovery learning*, *play*, and *reading instruction*.

The Constructivist Approach to Learning

Historically, extensive research has focused on *how* children learn (Dahl, 2004; Garfield & Ben-Zvi, 2007), *what* they learn (Lee & Ready, 2009), and what *motivates* them to learn (Bandura & Schunk, 1981; Bong, 2004; Zimmerman, Bandura, & Martinez-Pons, 1992). Constructivist roots actually date back as far as Socrates, who asked specific questions that caused students to recognize their own weaknesses in thinking (Educational Broadcasting Corporation, 2004; Tracey & Morrow, 2012). Eighteenth-century philosopher Rousseau (1712-1777) postulated that children think and learn differently from adults; they are more than miniature adults (Nielsen, 2006). Pestalozzi (1746-1827) was heavily influenced by Rousseau’s work. Known as the Father of Modern Education and the Father of Pedagogy, Pestalozzi believed that education should develop the head, heart, and hands and that teaching should focus on a child-centered rather than a teacher-centered approach; the environment should be active rather

than passive (“Johann Heinrich Pestalozzi,” 2004). Froebel (1782-1852), founder of kindergarten, a place where children learn in a natural way, expanded on Rousseau’s belief that children learn differently from adults and contended that they learn best through play. His teaching philosophy encouraged numerous hands-on, real-life experiences on which children interacted with and made sense of their world (Nielson, 2006). These founding fathers laid the groundwork for constructivist theory.

The constructivist approach to learning, credited to Piaget, is based on observation and the scientific study of how people learn (Piaget, 1964). Piaget established two key principles that he believed guided intellectual growth and biological development: (a) adaptation and (b) organization. He thought that people assimilated their environment and external events into their mental structures, which changed with experiences; hence, they made adaptations. Piaget felt that the brain was organized in integrated and complex ways and that these mental structures were performed on objects and events (Piaget, 1964). Constructivist theory is grounded in the belief that learners construct knowledge based on their past experiences and knowledge.

Current constructivist thought extends beyond the works of Pestalozzi, Rousseau, Froebel, and Piaget (Kalpana, 2014; Papert, 1991). It contains foundational principles including learner-centered instruction, learning-by-doing, play, and discovery learning. Considerable information backs constructivist learning theory and how it supports learning in today’s contexts (Kim, 2005; Matthews, 2003; Orlich, Harder, Callahan, Trevisan, & Brown, 2013; White-Clark, DiCarlo, & Gilchrist, 2008; Yuen & Hau, 2006). A review of the National Association of the Education of Young Children’s

position statement (2007) clearly imparts the organization's promotion of the constructivist approach. Constructivism is dominant in today's educational system.

According to Rushton, Eitelgeorge, and Zickafoose (2003),

Reflecting on our years of teaching, we have discovered that no matter what the age (pre-K or graduate students) or the content (whether it is a second grader studying the rain forest or in-service teachers studying the writing process) the same constructivist, brain research principles, and Conditions of Learning when applied, help foster a creative learning environment for students to develop their knowledge and grow as independent problem solvers. (p. 12)

Standardized and benchmark assessments used in the constructivist classroom reveal the effectiveness of the constructivist approach. Teachers in a CBLE encourage risk taking and discovery learning that can even challenge the content (DeVries, 2007; Taber, 2010).

Research over time suggested the positive effect the constructivist approach has on student achievement. Pfannenstiel and Schattgen (1997) conducted the largest study on constructivist vs. nonconstructivist education to date. Results showed that children whose teachers employed a constructivist approach to teaching attained higher levels of achievement than children whose teachers practiced a nonconstructivist approach to teaching. Students in the constructivist environment were shown to score significantly higher on standardized tests than their counterparts. A study by Wilson, Abbott, Joireman, and Stroh (2002) found that the constructivist approach to teaching seemed to have a meaningful impact on student achievement, as measured by the Washington

Assessment of Student Learning. DeVries (n.d.) reported results from a research study on the constructivist approach to instruction. Not only did children from the constructivist classroom score significantly higher on standardized tests than did students not enrolled in a constructivist schoolroom, but they also attained a higher level of achievement.

Learner-Centered Instruction in a Constructivist Environment

Constructivists espouse that learning is more than memorization (Johnson, Christie, & Wardle, 2005); it is questioning, testing, and understanding the world. In a learner-centered and constructivist environment, children interact with materials, question their answers, and prove their findings. The teacher assesses each learner and builds on each child's knowledge, promoting deeper understanding. McCombs and Miller (2007) stated, "the most highly motivated learning occurs only when learners possess: (a) choice and control about how, what, and when to learn; and (b) choice and control over what they want to achieve" (p. ix). A constructivist environment is learner centered, integrating a learner's general skills of inquiry, communication, critical thinking, and problem solving through gathering and synthesizing information. According to McCombs and Whisler (1997), learner-centered instruction emphasizes how learning occurs and involves teaching practices that encourage the highest levels of motivation, learning, and achievement; it guides classroom educational decisions.

Learning Centers and Learning by Doing in a Constructivist Environment

Learning centers are designated, self-contained areas in the learning environment where students engage in hands-on activities designed to provide experiences that allow learners to practice, revisit, and enhance their learning. The concept of learning centers is

not new. Dewey's early 1900s philosophy of progressive education emphasized "learning by doing" (Dewey, 1951; Pattillo & Vaughan, 1992, p. 74). He described an educational curriculum that was active, based on the child's experiences and interests, initiated by the child, and integrated into meaningful activities. "The teacher and the book are no longer the only instructors; the hands, the eyes, the ears, in fact the whole body becomes sources of information" (Pattillo & Vaughan, 1992, p. 74).

Teachers' careful planning and consideration in preparing for learning centers represent an educational philosophy, a commitment to individualized, self-directed, and individually constructed knowledge. Constructivist teachers believe that children construct knowledge from interactions with materials and people (i.e., environmental and social contexts) and that children should be autonomous, self-directing, and responsible individuals. Learning centers are a vehicle for such development and produce independent learners and thinkers (Lynch, Anderson, Anderson, & Shapiro, 2006; Pattillo & Vaughan, 1992). The learning center environment includes these characteristics: (a) learning becomes meaningful and personal, (b) student achievement follows suit, and (c) students are successful (Akkus, Kadayifci, Atasoy, & Geban, 2003; Rasinski & Oswald, 2005; Rosen & Salomon, 2007). A constructivist approach to learning requires a great deal of planning, organization, and time setting up activities in the various learning centers.

Teachers in a CBLE skillfully weave academic goals and objectives into the learning environment as they aim to build on children's prior knowledge. The constructivist classroom challenges all learners and encourages them to attempt new

encounters (Bullard, 2010; Gunning, 2012). Effective teachers evaluate their students and make adjustments as needed to better serve each individual. The constructivist teacher recognizes that his or her students bring a complex combination of knowledge, experiences, skills, beliefs, and attitudes to the learning environment. Understanding each student's thinking before guiding his or her instruction is imperative to bringing him or her to a deeper level of comprehension (Nitko & Brookhart, 2011). Essential to the constructivist approach is the opportunity for children to play and experiment with their knowledge. In the classrooms in this study, play was encountered through games focusing on specific reading skills, activities that encouraged social interactions, and opportunities to share what one had discovered.

Reading Instruction in the Constructivist Environment

Constructivist theory emphasizes that learning should be based on real-life experiences—that learning should be authentic. Hooper and Rieber (1995) attested that reading instruction should be grounded in settings familiar to students. This helps learners relate new information to their past understandings, making learning a more personally relevant experience. Flood and Lapp (1991) found that students were most successful in developing reading comprehension skills when instruction was based on constructivist principles, acknowledging each child's role as “the meaning-maker in the reading act” (p. 735). According to Graves, Juel, and Graves (1998), “constructivism strongly supports the inclusion of a variety of sorts of discussion and group work as part of reading and learning” (p. 10). Discussion and group work lend themselves to peer scaffolding and collaborative learning, components of constructivism. It is this active

involvement with reading materials and ideas and others that leads to success (Evangelisto, 2002). Reading in the constructivist environment is learner centered, concentrating on each student.

Learner-Centered Instruction in the Context of This Study

The university charter school in this study promoted a constructivist teaching philosophy (SFASU, 2016). According to a personal interview conducted in 2014, this school used learner-centered instruction to create an environment of inquiry-based learning that guided students in constructing their own knowledge and understanding. Learner-centered instruction concentrates on students being actively engaged in the learning process; they learn by doing rather than observing the teacher. Each new experience encountered builds on prior knowledge. According to Wadsworth (1996), knowledge is a self-regulated construction. In the student-centered environment, planning, teaching, and assessment revolve around students' needs and abilities. Learners explore, experiment, and discover on their own with the teacher as the facilitator (Brown, 2008). Both Piaget and Vygotsky believed that individual learners' needs and interests should be the foundation for creating the learning environment (Wadsworth, 1996).

Learning Centers and Learning by Doing in the Context of This Study

According to Froebel (1912), "play is the highest expression of human development in childhood, for it alone is the free expression of what is in the child's soul" (p. 50). A play-rich environment served as the foundation at the CBLE university charter school. Students engaged in play that allowed them to construct meaning and build on current knowledge while expanding it to other areas. Learning centers engaged

students in social interactions, challenging activities, and creative ways to approach learning.

The school in this study implemented learning centers in all content areas, including reading (SFASU, 2016). In these constructivist classrooms, children worked individually, worked in small groups, and participated in whole-group discussions. They interacted with materials specific to each learning area while actively participating in the learning process. Each center activity offered opportunities to support students in developing unique content knowledge, skills, and dispositions while promoting social skills and good work habits. All learning centers were purposefully planned to encourage independence and exploration. Reading instruction at the school in this study used small- and whole-group instruction as well as learning centers. Reading centers offered opportunities for children to practice essential skills needed to become effective listeners, speakers, readers, and writers (Bullard, 2010; Welsh, 2012).

Reading Instruction in the Context of This Study

Constructivists focus on the idea that learners construct their own knowledge out of meaningful experiences (Fox, 2001). According to Spiegel (1998), a balanced curriculum with attention to learner- and teacher-directed instruction, indirect and direct or explicit instruction, teacher-selected and student-selected materials, and both standardized and authentic assessment is key to successful reading instruction. The school in this study implemented such a balanced curriculum (SFASU, 2016).

First and foremost, reading instruction was student centered. Time and planning of the teacher were necessary up front in order to meet students' individual needs and

create connections to each student's prior knowledge and current reading skills. In addition, the learning environment was created in such a way as to actively engage the students. Vygotsky (1978, 1986) understood that language and communication help to organize thought and learning. He supported the idea that reading and writing are social activities. The CBLE in the current study created opportunities for peer interaction as well as continual reflection and discussion to create deeper understanding (SFASU, 2016).

Related Research

Current literature on educational learning environments reveals a noted controversy on how children learn best and the most effective approach to teaching them (Bonner & Chen, 2009; Chicoine, 2004; Kirschner, Sweller, & Clark, 2006). Research suggests that the constructivist teaching method considerably affects a student's success on standardized tests (Kim, 2005; Nie Lau, 2010; Staub & Stern, 2002). The current research project was anticipated to show that classroom environment played a vital role in student success on standardized tests.

Empirical research has proposed that positive outcomes come from constructivist instruction. For example, one study found that constructivist-based instruction improved university students' motivation toward learning mathematics (Nareli & Baser, 2010). Constructivist-based approaches, including scientific inquiry, lead to richer and more in-depth learning of science concepts in middle-level students (Cakici & Yavuz, 2010; Dhindsa, Makarimi-Kasim, & Anderson, 2011). Among secondary students in Singapore, a constructivist approach aimed at increasing student participation was found to have a

positive impact upon deep processing strategies, self-efficacy, task value, and academic achievement (Nie & Lau, 2010). Among high school orchestra students, a constructivist and learner-centered environment showed an increase in student motivation (Scruggs, 2009).

Critical Analysis

An investigation of teaching and learning theories showed that learners constantly form schemata, or interconnected cognitive webs, to organize their thoughts (Waite-Stupiansky, 1997). Piaget (1952) defined *schema* (singular for *schemata*) as a “cohesive, repeatable action sequence possessing component actions that are tightly interconnected and governed by a core meaning” (p. 240). According to Caine and Caine (1991), “our minds organize pieces of related information into complex webs, called schemata. New information becomes meaningful when it is integrated into our existing schemata. In this way, knowledge builds on itself, and the schemata grow exponentially” (p. 6). In this particular study, the constructivist approach impacted overall student success as measured by the state-mandated standardized tests.

Methodology

The methodology of this study was formulated to determine the effect, if any, the constructivist approach to teaching had on student achievement. Several researchers have investigated the relationship between constructivist teaching approaches and student achievement. In their studies, they have examined this topic from a teacher-level perspective (Kroesbergen, Van Luit, & Maas, 2004; Staub & Stern, 2002). For this

research project, investigations focused on examining state standardized test results of an entire fifth grade level taught in a constructivist environment.

Although state test data is an imperfect measure of learning in constructivist contexts (due to exploratory and nontraditional methods of teaching), such tests have been widely used in educational research to document trends in student achievement. Researchers have studied diverse topics such as the effects of technology use (O'Dywer, Russell, Bebell, & Seeley, 2008), computer assisted instruction (Tienken & Maher, 2008), teacher performance evaluation scores (Milanowski, 2004), and multiple literacies (Hansen, 2009) on state test scores. State testing does not always accurately reflect learning; however, due to the widespread use of state standardized test score data in research and educational decision-making, such as the retention of students in the state of Texas (TEA, 2010), it is used as the outcome variable in this study.

An ANCOVA was used to test for group differences on reading achievement between students who attended the CBLE university charter school for less than 1 year and students who attended the CBLE same school for longer than 2 years. Another ANCOVA served as a statistical test for differences between groups and controlled for a covariate, based upon assumptions of normality in the data (Issac & Michael, 1995). In this study, the covariate was previous achievement, an important predictor of current achievement. By controlling for previous achievement, the researcher learned about the growth of students' achievement across years.

Social sciences and educational research rely on ANCOVAs to examine the differences between two groups while also controlling for additional variables. For

example, Junco, Heiberger, and Loken (2011) used an ANCOVA to detect relationships between computer usage and academic achievement in university students. Other studies using ANCOVA investigated the effects of tutoring (Warren-Kring & Rutledge, 2011), computer software (Chambers & Blake, 2008), and virtual manipulatives (Trespacios, 2011) on academic achievement. Documenting differences and publishing the research to substantiate the findings can lead to further debate and questioning about how children learn.

Summary

More and more educators are concluding that traditional teaching practices (lecture, worksheets, drills, and timed tests) are failing, based on fundamental understandings of how children learn. As stated by Bickart, Jablon, and Dodge (1999):

The goals, principles, and instructional approaches that emerge from a developmentally appropriate philosophy and an understanding of the subject areas give us a clear framework to help children acquire the skills and understandings they will need to function productively as we move into the twenty-first century.

(p. 3)

According to Botzakis (2004), the focus of educational accountability is to hold schools responsible for successfully education students. Examining variances in benchmark testing scores of the two groups studied at the university charter school is one way to illustration differences and contributing factors to student success. Documenting these differences and publishing research to substantiate the findings will lead to further debate and questioning about how children are taught. This may potentially result in

positive change. The effect of the CBLE approach to reading achievement can contribute to transforming how educators look at teaching; therefore, resulting in children becoming effective thinkers and learners. Educators continually strive to increase student achievement for all learners. Through examining the various types of and beliefs about learning environments and comparing standardized test results of this dichotomy will lead to determining the most successful approach to education and reading achievement. By analyzing these results, professional educators can explore ways to improve instruction that, in turn, benefit their students. Potential changes will result in positive social change.

Present research on learning environments is vast and varied. There are several teaching styles and methods, each of which is grounded in research. Further review of all learning theories and practices remains critical to improving the best ways to teach children, create lifelong learners, and contribute to students' overall success.

Section 3: Research Method

The purpose of this study was to examine the relationship between the length of time enrolled in a CBLE and reading achievement as measured by the TAKS and STAAR tests. It also examined the growth in reading achievement, as measured by the TAKS and by the STAAR tests, of fifth grade students enrolled in the CBLE for more than 2 years compared to that of students enrolled for less than 1 year. This section includes a discussion of the study's research design and approach, setting and sample, instrumentation and materials, data collection and analysis, and protections of participants' rights.

Research Design and Approach

This study was quasi-experimental using a nonequivalent control group design in which existing data from a CBLE university charter school were examined to determine whether there were differences between children's reading test scores based on length of exposure in a CBLE.

ANCOVA was used to compare fifth grade TAKS and STAAR test reading scores for students who were enrolled at the CBLE university charter school for more than 2 years and less than 1 year. Additionally, a *t* test was used to compare the growth in TAKS and STAAR test reading scores between fourth and fifth grade.

Setting and Sample

The setting for this research was a CBLE university charter school in rural East Texas. Enrollment in the charter school was based on an equal-opportunity lottery system within the school district boundaries. The school consisted of 132 total students, with

approximately 22 students enrolled in each of two classrooms per grade level in kindergarten through fifth grade. The local school district had six elementary schools serving children in kindergarten through fifth grade.

This study used archival data consisting of information gathered for fourth and fifth grade students who attended the CBLE university charter at some point. In Fall 2010, there were 39 fifth grade students enrolled in two classrooms; 15 of the students were newly enrolled, and 24 had attended the CBLE for more than 2 years. In Spring 2011, all fifth grade students at the CBLE took the TAKS test to evaluate their academic achievement. In the 2011-2012 school year, the state changed from the TAKS test to the recently developed STAAR test.

The G*Power3, created by Faul, Erdfelder, Lang, and Buchner (2007), was used to calculate the necessary sample size. For an ANCOVA with fixed effects, the following elements were required. When an anticipated moderate-to-large effect size of 0.5 is chosen with α level of .05, a power value of .8, and a numerator for df of 1, then a sample size of 34 is acceptable. This study proposed a sample size of 191.

There were test score data associated with 191 students, including 15 students who were new to the university charter school and 166 students who continued in the university charter school for more than 1 year. Due to missing data for 4th grade reading scores and inconsistency in the scale used for test scores because of the implementation of the new STAAR test, 10 student scores were deleted from the data analysis.

Treatment

According to Hagan (2014), all teachers employed by the CBLE in this study practiced constructivism because it was the campus-wide philosophy of learning. The school ensured that all teachers had access to and training in the same learning opportunities, such as responsive classrooms, contexts for learning mathematics, teachers' college reading and writing project, and thinking strategies. The school community also collaborated on numerous educational book studies during the school year.

The school in this study strove to provide a CBLE in which students constructed knowledge as opposed to receiving it. In this CBLE, teachers strove for their students' understanding, as opposed to transmitting as much material as possible in the shortest amount of time. Students were asked to think critically and analyze information in the learning process. Learners were expected to be both physically and mentally active in learning (Hagan, 2014).

Instrumentation and Materials

In 1979, Texas Legislature passed Senate Bill 350, requiring every public school district to administer a criterion-referenced test to students in Grades 3, 5, and 9 for the purpose of using test results as a diagnostic tool. Currently, Texas requires standardized testing in reading and mathematics for third through eighth grades for all public and open enrollment charter schools.

From 2003 to 2010, the criterion-referenced TAKS was used to measure student achievement of the state's curriculum standards. The TAKS test was replaced with the STAAR test beginning in the 2011-2012 academic year.

Test reliability indicated the consistency of measurement. TAKS and STAAR reliability was based on internal consistency measures, in particular, on the Kuder-Richardson Formula 20 (KR-20) for tests involving dichotomously scored (multiple-choice) items and on the stratified coefficient alpha (based upon item difficulty) for tests involving a mixture of dichotomous and polytomous (essay-prompt and short answer) items (TEA, 2010a). The TAKS and STAAR tests provided collected scores that served as a proxy for direct measurement of underlying achievement levels; the scores contained some amount of error as quantified by test reliability. The internal consistency reliability coefficients ranged from the high 0.80s to low 0.90s on the TAKS as well as the STAAR (see Table 2 and Table 3 for reliability estimates for each test administration).

Table 2

Reliability Measures for Reading TAKS

Year	<i>n</i> of items	<i>n</i> of students	<i>SD</i>	α	Standard error of measurement
Fourth grade					
2010-2011	40	330923	6.234	0.878	2.177
2009-2010	40	326304	6.142	0.875	2.172
2008-2009	42	323665	6.881	0.902	2.154
2007-2008	42	316349	6.773	0.889	2.257
2006-2007	42	298431	6.538	0.884	2.227
2005-2006	42	285433	6.784	0.886	2.291
Fifth grade					
2010-2011	42	341466	5.749	0.858	2.166
2009-2010	42	331702	5.819	0.853	2.231
2008-2009	44	327009	7.224	0.902	2.261

Table 3

Reliability Measures for Reading STAAR

Year	<i>n</i> of items	<i>n</i> of students	<i>SD</i>	α	Standard error of measurement
Fourth grade					
2014-2015	44	341747	9.204	0.909	2.775
2013-2014	44	338859	8.666	0.894	2.824
2012-2013	44	335311	8.821	0.902	2.768
2011-2012	44	334447	8.396	0.890	2.780
Fifth grade					
2014-2015	46	351331	9.081	0.907	2.775
2013-2014	46	349324	31.188	0.898	2.834
2012-2013	46	345132	8.227	0.883	2.817
2011-2012	46	348793	8.305	0.884	2.830

TAKS and STAAR test validity was based upon “test content, response processes, internal structure, relations to other variables, and consequences of testing” (TEA, 2010b, p. 71). Tests were developed using a five-step process in which written items were based on test objectives, reviewed multiple times, field tested, reviewed by educators, and then compiled using predefined criteria (TEA, 2010b).

Data Collection and Analysis

Data were retrieved from the publically available TEA records. Some data were gathered from the CBLE students’ permanent records. Student records for currently

enrolled and incoming students included all state test information, including TAKS and STAAR test scores, in order to have access to the fourth grade scores of new students.

ANCOVA were used to answer the first research question. Specifically, the reading scores from the TAKS and the STAAR of students who were enrolled in the CBLE for more than 2 years were compared with the scores of students who were enrolled in the CBLE for less than 1 year. Growth in reading achievement, as measured by the TAKS and STAAR tests, of fifth grade students enrolled in the CBLE for more than 2 years and less than 1 year. Two academic age groups (fourth and fifth grades) of data, plus data for the newly enrolled fourth grade students, enabled me to compare student scores before and after entering the university charter school.

To answer the first research question (“What is the difference in reading test scores as measured by the TAKS in 2011 and by the STAAR in 2015 between fifth grade students who have been enrolled in the CBLE for more than 2 years and fifth grade students who have been enrolled for less than 1 year, while controlling for previous reading levels by the fourth grade test scores?”), the analysis compared scores of fifth grade students enrolled in the CBLE for 2 years with those of students who attended the CBLE for less than 1 year, with the dependent variable of fifth grade scores on the TAKS and STAAR tests. The independent variable was the time in the CBLE, with two levels: more than 2 years and less than 1 year, and the covariate was fourth grade TAKS and STAAR reading test scores, which controlled for pre-existing knowledge and ability levels. Analyses compared reading achievement scores of students enrolled in the CBLE

for more than 2 years with those of students who were enrolled for less than 1 year, while controlling for previous achievement. This answered the first research question.

The second research question (“What is the difference in the growth of reading test scores from fourth to fifth grade as measured by the TAKS in 2011 and by the STAAR in 2015 between students who have been enrolled in the CBLE for more than 2 years and students who have been enrolled for less than 1 year?”) was answered through *t* test. The dependent variable was growth in reading test scores between fourth and fifth grade. The independent variable was the time in the CBLE, with two levels: more than 2 years and less than 1 year. A final analysis compared CBLE students’ growth in reading test scores from fourth to fifth grade to that of students enrolled at the CBLE for only the fifth grade. This analysis answered the second research question.

Assumptions must be met in order to use an ANCOVA. The first four assumptions were those underlying the ANOVAs (Hinkle, Wiersma, & Jurs, 2003). Assumption 1 was that samples from the population were random and independent. Children attending the CBLE were selected through a lottery system; therefore, students enrolled for more than 2 years and those enrolled in the fifth grade represented a random and independent sample. The second assumption of an ANOVA is that the distribution of the dependent variable (i.e., reading achievement scores) is normal. As achievement can be assumed to be normally distributed, this assumption was marginally met; however, as TAKS and STAAR scores are criterion referenced rather than norm referenced, these scores might not represent a true normal distribution but can be tested at time of analysis. A third assumption was that population variances of distribution were equal. When

examining variable distribution, one can test for homogeneity of variance in the statistical analyses and adjust the correction for the Type I error rate, if needed. There are additional assumptions that must be met when looking at ANCOVA. The relationship between the dependent variable and the covariate should be linear. As these variables represent the same construct (reading achievement) at varying points in time, one assumes linear growth over a year's time. The fourth assumption was homogeneity of regression, which was the assumption that there was not an interaction between the covariate and the independent variable. In other words, it was assumed that enrolling in the CBLE did not affect the previous years' achievement scores.

Role of the Researcher

From 1998-2008, the charter school was an extension of the local independent school district; however, in 2008, the charter school separated from the school district and became its own school district, affiliating with the local university. During this study, I was the campus coordinator for the university charter school and had one child currently enrolled in the school.

Protection of Participants' Rights

The Institutional Review Board at Walden University and the university charter school's research committee approved this study. Parents of the fifth grade students received a letter at the beginning of the academic year and consented for their children and their educational data to be included in the study. Student names were deleted from data prior to analyses to ensure complete anonymity. Data will remain on a password-protected computer for 5 years and will then be destroyed.

Summary

Educators continually strive to increase student achievement for all learners. Investigating whether the length of time a student is enrolled in the CBLE has an impact on reading achievement may determine a more successful learning environment. By examining these results, professional educators may be able to improve their teaching styles and strategies; in turn, learners will potentially benefit, resulting in positive social change.

Section 4: Results

This section presents findings associated with TAKS and STAAR test reading scores for students enrolled in the CBLE. Data were analyzed using ANCOVA and *t* test with the Statistical Package for the Social Sciences (SPSS; Field 2005). The relationships between the length of time children were enrolled in the CBLE and their reading achievement test scores were examined, along with the growth of reading achievement between fourth and fifth grades.

Two research questions were investigated in this study. The first research question concerned the difference in reading achievement test scores between fifth grade students enrolled in a CBLE for more than 2 years and students enrolled in the CBLE for less than 1 year, as measured by the TAKS and STAAR tests and controlled for fourth grade achievement. Research Question 2 investigated the growth in reading achievement, as measured by the TAKS and STAAR tests, of students from fourth to fifth grades to determine if students enrolled in the CBLE for more than 2 years scored significantly higher than students who enrolled for less than 1 year.

Research Tools

TAKS and STARR reading scores were used to determine each student's growth or lack of growth. Exam administration took place toward the end of students' third, fourth, and fifth grade academic years. TAKS and STAAR reading scores were collected for each student in this study and used to determine if there was a difference in reading test scores related to the length of time students had been enrolled in the CBLE and to determine if there was greater growth in students enrolled in the CBLE for more than 2

years than in those enrolled for less than 1 year. Test scores were entered into an Excel document and analyzed using SPSS version 21.

Data Analysis

Student achievement scores in reading, as determined by the reading section of the TAKS and the STARR tests, were examined. Originally, there were 166 students who attended the CBLE for more than 2 years and 23 who attended the CBLE for less than 1 year; however, some data were removed from the final analyses for the following reasons:

1. For the year 2011-2012, the test used in fourth grade was TAKS and the test used in fifth grade was STAAR; inconsistencies existed between these two tests' scores. Additionally, there were only two students enrolled for less than 1 year for comparison. For these reasons, the 2011-2012 data were removed.
2. No students met the criteria of enrollment for less than 1 year for the 2012-2013 academic year; therefore, data for 2012-2013 were removed.
3. Only one student met qualifications for enrollment for less than 1 year in the 2013-2014 academic year; therefore, the data for this year were removed.

Final data are presented in Table 4: TAKS (2010-2011) and STAAR (2014-2015) Fifth Grade Reading Scores.

Table 4

TAKS (2010-2011) and STAAR (2014-2015) Fifth Grade Reading Scores

Variable	<i>n</i>	<i>M</i>	<i>SD</i>
Year I: 2010-2011			
CBLE for more than 2 years	24	718.21	102.534
CBLE for less than 1 year	15	652.75	42.681
Year V: 2014-2015			
CBLE for more than 2 years	38	1575.71	111.088
CBLE for less than 1 year	4	1513.25	27.220

The data for Research Question 1 consisted of 81 students' scores from the 2010-2011 and 2014-2015 years of data collection; two student groups constituted this study. Group I included reading test scores for 62 students enrolled in the CBLE for more than 2 years. Group II included 19 reading test scores for students enrolled in the CBLE for less than 1 year.

Research Question 2's final data consisted of 75 students' scores from 1 year of data collection. A total of 2 years of test scores constituted this study that examined growth in reading scores of the two groups.

Before a one-way ANCOVA was run, assumptions were tested. The assumption of independence was met, as each student test score was only in one group. All students represented in each year's data included in this study took the exact same exam and were scored in the exact same way. The fifth grade reading scores met the assumption of normal distribution, with skewness of $-.766$ and kurtosis of 1.152 . According to the cutoff

values for skewness (-1, ~1); (Hildebrand, 1986) and kurtosis (-2, ~2); (George & Mallory, 2010), the distribution for fifth grade reading scores was relatively normal. The assumption of equal variance was explained using Levene's test of equality of error variances. Levene's test results, $F(1, 179) = .085, p = .771$, showed that the assumption of equal variance was met.

Results for Research Question 1

For the first research question, four ANCOVA were calculated: two for the 2010-2011 academic year and two for school year 2014-2015. To determine if there was a significant interaction between group variable and covariate, the first ANCOVA was conducted; it included an interaction term of $\text{group} * \text{reading4th}$ for the 2010-2011 year data. The results showed that the interaction effect was not significant with $F(1, 32) = 1.683, p = .205$, suggesting that the homogeneity of regression slopes assumption was met. Therefore, it was removed.

The second ANCOVA was carried out by including an interaction term of $\text{group} * \text{reading4th}$ for the 2014-2015 year data in order to determine whether there was a significant interaction between group variable and covariate. The results revealed that the interaction effect was not significant with $F(1, 42) = .058, p = .811$, suggesting that the homogeneity of regression slopes assumption was met. It was therefore removed.

The third ANCOVA analyzed fifth grade reading test score mean differences between students enrolled in the CBLE for more than 2 years and students enrolled in the CBLE less than 1 year for the 2010-2011 academic year, after statistically controlling for the prior influence of fourth grade reading achievement. After controlling for fourth

grade achievement, the results indicated that there was a statistically significant difference in reading scores on the TAKS test, with $F(1, 32) = 15.374, p = < .001$. Students in the CBLE group for more than 2 years demonstrated higher mean reading scores than students enrolled in the CBLE group for less than 1 year. See results in Table 5: ANCOVA of Instructional Group by Fifth Grade Reading Achievement Controlling for Fourth Grade Reading Achievement 2010-2011.

Table 5

ANCOVA of Instructional Group by Fifth Grade Reading Achievement Controlling for Fourth Grade Reading Achievement 2010-2011

Source	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial eta squared
Model	3	6037059.11	2002.395	.000	.995
Reading4th	1	54365.834	18.032	.000	.383
Group	2	46352.281	15.374	.000	.515
Error	29	3014.920			
Total	32				

The fourth ANCOVA analyzed the test score mean differences in fifth grade reading between the scores of students in the CBLE for more than 2 years and students in the CBLE for less than 1 year for the academic year 2014-2015. Controlling for the effects of fourth grade achievement, the results showed that there was a significant difference in reading scores on the STAAR test, with $F(2, 42) = 9.427, p < .001$. Students in the CBLE group for more than 2 years demonstrated higher mean reading scores than those in the CBLE for less than 1 year. See results in Table 6: ANCOVA of Instructional Group by Fifth Grade Reading Achievement Controlling for Fourth Grade Reading Achievement 2014-2015.

Table 6

ANCOVA of Instructional Group by Fifth Grade Reading Achievement Controlling for Fourth Grade Reading Achievement 2014-2015

Source	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial eta squared
Model	3	37804471.9	6159.982	.000	.998
Reading4th	1	136229.135	22.198	.000	.363
Group	2	57855.612	9.427	.000	.326
Error	39	6137.108			
Total	42				

Results of Research Question 2

For each standardized reading assessment test, a *t* test was conducted to answer the second research question. The first *t* test was calculated for the 2011 TAKS test results to determine whether there was a significant difference in score growth between the two groups for the 2011 TAKS reading scores. The results revealed that the *t* test was not significant with $t = -.607$, $p = .548$. The second *t* test was calculated for the 2015 STAAR test results to test whether there was a significant difference in score growth between two groups for 2015 STAAR reading scores. The results also revealed nonsignificant results: $t = .277$, $p = .783$.

Summary

This quantitative study investigated differences between TAKS and STAAR reading test scores for students enrolled in the CBLE at a university charter school for more than 2 years and students enrolled in the CBLE for less than 1 year. Results provided evidence that there was a statistically significant difference in TAKS and STAAR reading test scores when controlling for fourth grade reading TAKS and STAAR

test scores; however, there was no statistically significant difference in the growth on TAKS and STAAR reading test scores between fourth and fifth grade.

Section 5: Discussion, Conclusions, and Recommendations

The purpose of this research study was to examine the difference in fifth grade reading test scores and reading growth scores as measured by the TAKS (administered until 2011) and the STAAR (replaced TAKS in 2012) between students who had been enrolled in the CBLE for more than 2 years and students who had been enrolled for less than 1 year. Two research questions guided this study:

1. What is the difference in reading test scores, as measured by the TAKS in 2011, and by the STAAR in 2015, between fifth grade students who have been enrolled in the CBLE for more than 2 years and fifth grade students who have been enrolled for less than 1 year, while controlling for previous reading levels by fourth grade test scores?
2. What is the difference in the growth of reading test scores from fourth to fifth grade, as measured by the TAKS in 2011, and by the STAAR in 2015, between students who have been enrolled in the CBLE for more than 2 years and students who have been enrolled for less than 1 year?

Five years of archival data were collected for this study; however, only data for 81 students for the 2010-2011 TAKS and the 2014-2015 STAAR reading test scores were analyzed.

Overview of the Study

As the United States became more reliant on standardized tests, approaches to teaching reading changed. My research focused on examining the relationship between reading achievement and time spent in the CBLE at a university charter school in a small,

rural East Texas community. The data were examined to determine whether there was a difference in fifth grade reading test scores and reading growth scores, as measured by the TAKS test in 2011, and by the STAAR test in 2015, between students who had been enrolled in the CBLE for more than 2 years and students who had been enrolled in the CBLE for less than 1 year, as well as to determine whether there was greater growth in reading scores from these same groups from fourth to fifth grade. The null hypothesis and alternative hypothesis were analyzed to answer the questions. ANCOVA and *t* tests were carried out.

Examining standardized reading achievement scores of these students showed whether the teaching and learning environment affects reading success as measured by standardized tests. This study may result in positive social change by transforming how educators look at their teaching goals and standardized testing, ultimately contributing to students' success on standardized tests. Determining the learning environment factors that contribute to success on state standardized exams is critical to creating more successful and prepared students.

Interpretation of Results

This quantitative research study suggested that the university charter school's CBLE statistically impacted the TAKS and STAAR tests reading achievement scores of fifth grade students. Children who had been enrolled in the CBLE university charter school for more than 2 years had a higher mean score on their reading tests than children who had been enrolled in the CBLE university charter school for only their fifth grade year. However, the growth of reading test scores from fourth to fifth grade was not

significant. This may have been due to students who had been enrolled in the CBLE for more than 2 years being better prepared to take the reading standardized test and may account for reading test score differences.

Research Question 1

The analysis of the data for Research Question 1 rejected the null hypothesis. The current study supports a statistical difference in the scores of these two student groups, demonstrating that constructivist teaching techniques are related to higher student test scores. This suggests that the length of time a student is enrolled in a CBLE may affect the student's TAKS and STAAR reading test scores in a positive way.

Research Question 2

The analysis of data for Research Question 2 did not reject the null hypothesis. This study did not show any statistically significant differences in growth of reading test scores from fourth to fifth grade between these two groups. Although differences between fourth grade reading scores and fifth grading reading scores were noted, it was impossible to determine whether score differences were attributable to the learning environment. Students enrolled in the CBLE university charter school for more than 2 years demonstrated higher mean reading scores than pupils enrolled in the CBLE for less than 1 year. Differences between these two scores indicate that students with above average fourth grade reading scores will have above average fifth grade reading scores, regardless of their learning environment. A regression threat is a statistical phenomenon based on probability that occurs when the two groups compared are imperfectly correlated. Due to this, there is a greater probability that the differences will be masked to

some extent (Garcia-Perez, 2012). The differences in reading test scores were not statistically different, so one can surmise that the growth in reading was similar, regardless of the learning environment.

Implications for Social Change

Standardized testing plays a prominent role in educational policy and in efforts to improve the quality of education (Herman, 1993). Research studies have been conducted to determine the value of standardized testing and whether test scores actually signify improvements in learning (Cannell, 1988). Some researchers believe that standardized testing may actually have a negative influence on student learning and on instructional processes (Bracey, 1989). Designers of such tests strive to choose test items that most likely measure content knowledge and skills; however, standardized tests always contain test items that do not align with the content taught in any particular learning environment (Popham, 1999). Analyzing learning environment data and the impact of the learning environment on standardized reading test scores can ultimately improve the educational process.

Dewey (2001) wrote that society constantly changes and claimed that education reflects these changes. He suggested that schools have a positive influence on society and hold the power to lead society in a specific direction. The decisions schools make provide a better understanding of the relationship between schools and social change (Dewey, 2001). This study contributes to a body of knowledge that has the potential result in positive social change by transforming how educators look at teaching and testing goals, eventually contributing to children's success on state standardized tests.

Recommendations for Action

Dewey believed that the educational system was founded on the equal opportunity principle. Schools develop and prepare students. Students are prepared in schools and grow to be confident enough to use what they know and apply it to their decision making, thus improving society (Bishaw & Egziabher, 2013; Dewey, 2001). More active research is needed to explore standardized achievement test scores in reading and how specific learning environments impact these scores. This will help educators to better understand current testing processes. Sharing these results will assist in drafting an effective educational campaign for educational colleagues, parents, and policymakers. An important focus for future studies is to continue research that relates to how the learning environment impacts standardized test scores, particularly in reading.

Further research on the effect the learning environment has on reading achievement may transform how educators look at teaching, thereby helping children become successful thinkers and learners. Educators continually strive to increase all learners' achievement. Examining beliefs about various learning environments and the standardized test scores of children participating in these environments leads one to compare standardized test results to determine the best learning environment.

Recommendations for Further Study

Given the findings and limitations of this study, additional research is needed to better understand how the learning environment impacts standardized test scores and reading achievement. Qualitative data highlighting teacher perceptions of the impact the learning environment and testing preparation have on standardized test scores should

inform upcoming research projects. Recommendations include further investigations that focus on how the learning environment affects standardized test scores. While this research study is specific to a small rural community in East Texas, it may provide helpful information for schools across the country.

Conclusion

As the United States becomes more reliant on standardized tests, approaches to teaching reading are changing. This research study examined the relationships between reading test scores and reading growth scores as measured by state standardized test scores of children enrolled in a CBLE for more than 2 years and students enrolled in a CBLE for less than 1 year. Through a careful analysis of this study's results, educators can investigate ways to improve classroom instruction, which directly impacts student success. Such changes will result in positive social change.

Additional studies examining outcomes of these two groups' performances on state standardized tests, particularly in reading, may indicate how teaching and learning environments affect success. In the United States, all school-age children are required to be enrolled in school. The State of Texas requires all public school and open charter school children to be administered the state-adopted standardized test. These test scores play a vital role in determining student success. The results of this study provide preliminary evidence that the learning environment a student is enrolled in may have a positive effect on test scores, specifically in reading.

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