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The Effect of Instructional Coaching on Third-Grade Reading Achievement

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This is to certify that the doctoral dissertation by

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Abstract

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BS, Illinois State University, 1976

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Instructional coaching has been implemented in schools to improve student achievement; however, literature shows a lack of evidence of the efficacy of improving student reading achievement. The problem addressed in this study was that school districts have implemented instructional coaching to improve student reading achievement, but the effectiveness was unknown. The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement. Guided by Walberg's theory of achievement, the overall research question investigated the effect of instructional coaching on third-grade reading achievement. In this quantitative, comparative study, ratio-scale data from students who received instructional coaching (intervention group) and those who did not receive instructional coaching (control group) were analyzed with a repeated-measures mixed Analysis of Variance (ANOVA). Archival data were used from the Formative Assessment System for Teachers (FAST™) on the Adaptive Reading (aReading) assessment during an 18-week instructional time for the 2018-2019 school year. The findings of this study did not show a significant difference in achievement between the control group and the intervention groups; the control group made greater gains during the instructional period than the intervention group. This study provided one step toward a better understanding for educators and school districts on the effect instructional coaching may have on reading achievement, with recommendations for additional study in this area. Studies of this type have the potential to instill positive social change for students in school districts that adopted instructional coaching to increase student achievement.

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Dedication

This dissertation is dedicated to my husband, children, and grandchildren who provided me with many reasons to finish what I set out to accomplish.

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Chapter 1: Introduction to the Study

Introduction

Since the U.S. Secretary of Education published in 1983 *A Nation at Risk* followed by the 1998 *A Nation Still at Risk*, our nation grew in its awareness that American achievement was poor when compared to students in other economically advanced countries. GOALS 2000 followed by No Child Left Behind 2002 (NCLB) attempted to create reforms that would raise achievement, both illuminating where students were making progress and where support was needed. This legislation scaled up the federal role to hold schools accountable for student outcomes and penalizing schools that did not show improvement (Lee, 2022). NCLB was legislation that highlighted where students were progressing and areas needing additional support; however, the measures in NCLB became unworkable for districts to implement. This led to the creation of Every Child Succeeds Act (Sharp, 2016) which was signed into law in 2015 replacing NCLB and gave more authority for education back to the state. Its intent was "to ensure states to set high college and career standards" and enabling "states and local education agencies to use appropriate, evidence-based interventions to foster school improvement" (Sharp, 2016, p.1). Throughout the adoption of education reforms, measuring student achievement has been central to evaluating success in education. One measure of student achievement has been the use of reading achievement scores.

Reading achievement is measured by a student's ability to comprehend what is read through an ability to understand details, place them in sequence, and derive meaning from written material. Reading achievement is a critical element of K–3 education (Rose

et al., 2000). The ability to read is essential for learning and succeeding in school and is central to the acquisition of knowledge throughout life (Ugwu, 2019). Reading allows students to learn other subjects throughout their schooling and in their jobs, as over 87% of adults report they read on their jobs. It is one of the major tools for mastering 21st Century skills, and it is through reading comprehension assessments that schools measure student achievement. The National Assessment of Educational Progress (NAEP) achievement levels describe what students should know and be able to do (National Assessment of Educational Progress, 2021). According to NAEP (2021), in 2019, only 35% of fourth graders across our nation were proficient in reading. With reforms and assessment reports showing the deficiencies in education, improving student achievement became a strong goal for all school districts. In that journey towards improvement, districts have sought specific ways to enhance student achievement, and one method instituted in school districts to improve achievement has been the adoption of instructional coaching.

Instructional coaching has been implemented in school districts across our nation with the main goal of improving student achievement. To accomplish the goal of improved student achievement, instructional coaching has been implemented to provide meaningful job-embedded professional learning for teachers to improve instruction and to assure effective instructional practices are implemented in classrooms (Kurz et al., 2017; Reinke et al., 2014). To assure that instructional coaching is a meaningful way of improving student achievement, additional studies are needed to examine the difference in student achievement between students receiving instructional coaching and those who

do not (Coe et al., 2014; Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). In the state where the study presented in this paper took place, all 332 school districts have implemented an instructional coaching model as a part of establishing teacher leadership roles and improving student achievement. The website of the state department of education stated that the purpose of establishing teacher leadership roles such as instructional coaching was to increase student achievement (Iowa Department of Education, 2017); however, few studies support an increase in student achievement through instructional coaching (Killion, 2017; Kraft et al., 2018).

The focus of this study was third grade reading achievement during an 18-week instructional period with a control group in one district (n = 80 students) who did not receive instructional coaching compared with an intervention group in another district (n = 101 students) who received instructional coaching. This study has the potential to provide research for school districts to make an informed decision when determining instructional coaching and its use to enhance student achievement. The potential for positive social change for school districts may be found in the selection and implementation of a coaching model to increase student achievement through the development of coaching relationships between classroom teachers and instructional coaches. The theoretical basis of instructional coaching can be found within the components of Walberg's theory of achievement, as the intent of coaching is to increase student achievement.

This chapter will consist of the following major sections: background and gap in knowledge, problem statement and necessity of the study, purpose and intent of the study,

research questions and hypotheses, and the theoretical framework (Walberg's theory of achievement). It will also include the theory's connection to instructional coaching. The nature of the study with the rationale of the design will be identified as well as definitions, assumptions, scope and delimitations, limitations, significance, and summary.

Background

Instructional coaching has become a strong part of the delivery of education in today's schools. Instructional coaching is implemented to improve student achievement (Kurz et al., 2017; Reinke et al., 2014). Studies support there is a gap remaining in the literature that supports instructional coaching to improve student achievement (Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). A literature search began with an examination of the variety of forms used in coaching.

Instructional coaching comes in a variety of forms. Coaching can be content coaching, which specifically focuses on a content area, or it can be a general coaching model with goals set by the teacher and coach. Content coaching includes school district teaching positions such as reading specialists and math interventionists. Several studies support the use of content coaching to improve student achievement (Edwards et al., 2015; Garcia et al., 2013; Perkins & Cooter, 2013; Sailors & Price, 2015). However, this study is unique because it addresses the implementation of general coaching models that are not content coaching; these are models designed to use in any content area (not focused on one selected subject area) where the teacher and coach set specific goals in the classroom to improve student achievement. The general coaching models in this study were student-centered instructional coaching and induction instructional coaching.

Student-centered instructional coaching and teacher induction coaching have been implemented in school districts across the United States to improve reading achievement. These types of coaching have a clearly defined process with the intent to improve student achievement (Boehle, 2014; Hasbrouck, 2017; Sweeney, 2018; Sweeney & Harris, 2017; Young et al., 2017), but there are few quantitative studies on coaching that show a statistically significant difference for third-grade reading achievement. Researchers have stated that there is a gap in the literature when determining the effects of instructional coaching on student achievement (Coe et al., 2014; Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). Although the intent of instructional coaching is to improve student achievement (Kurz et al., 2017; Reinke et al., 2014), there is a gap in the literature examining the difference in reading achievement with and without instructional coaching.

Problem Statement

The problem addressed in this study was that school districts have implemented instructional coaching to improve student reading achievement, but the effectiveness is unknown. Although the intent of implementing instructional coaching is to improve student achievement, literature shows a lack of studies that support this assumption (Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). Today's education initiatives focus on student achievement and emphasize the need for instructional improvement through developing an educator's implementation of evidence-based practices (Kurz et al., 2017). These practices are employed to improve student learning, behavior, and/or attitude (Knight et al., 2015; Kurz et al., 2017; Woulfin & Rigby, 2017). Professional development activities have traditionally focused on teacher knowledge of evidence-

based practices (Spelman et al., 2016) with little research on how the implementation of these practices improved student achievement.

Instructional coaching can provide effective professional learning activities. Coaching cycles are collaborative learning opportunities providing job-embedded professional learning (Sweeney, 2018). Research supports that learning opportunities are most effective when job embedded and learner centered (Mangin & Dunsmore, 2015; Spelman et al., 2016; Teemant, 2014). Instructional coaches are active guides with teachers and serve as collaborative partners in the application of professional development (Desimone & Pak, 2016; Reinke et al., 2014; Tanner et al., 2017). According to Knight (2019), "effective coaching involved not only strategic knowledge but an intentional process" (p. 29). The application of professional learning activities provided to teachers through the instructional coaching process has a greater goal than just implementing professional development, and that goal is to improve student achievement.

In my review of existing literature, there were only nine out of 1300 studies that supported causal inferences of teacher coaching on instruction and achievement. When meta-analyses were done on the effect of teacher coaching on instruction and achievement, there were limitations in existing studies that made it difficult to support the question of a statistical difference in student achievement with and without coaching (Foster, 2018; Kraft et al., 2018). Foster (2018) stated their study pointed to a body of research that needs to be explored more deeply from "positive multi-study findings of literacy coaching to single studies that can be leveraged, cited, or built on in future

research" (p. 19). It was the intent of this study to be a single study to build on the current research using data on third-grade reading achievement with and without instructional coaching. This study can be replicated and built upon in the future.

Instructional coaching is a universal practice for improving professional performance through capacity building with individuals and/or groups of educators (Kurz et al., 2017; Reinke et al., 2014; Young et al., 2017). Research supports that the greatest gain through instructional coaching is when coaches "understand the complexities of working with adults, use an effective coaching cycle, know effective teaching practices, gather data, employ effective communication strategies, are effective leaders, and receive support by school and district" (Knight, 2016, p. 27). Instructional coaching models vary according to the elements upon which they are built. The student-centered instructional coaching model is based on individual needs using student work as a guide and provides job-embedded professional learning, productive dialogue, and reflection on practices (Haneda et al., 2017; Wang, 2017). Induction coaching aims to provide teachers new to the profession support with management and instructional skills (Young et al., 2017). Research supports the specific factors found in an effective instructional coaching model (Knight et al., 2015), and these factors are found in the student-centered coaching model framework (Sweeney & Harris, 2017) and the induction coaching framework (Young et al., 2017). Currently, there is a specific process that describes student-centered coaching (Sweeney, 2011; Sweeney & Harris, 2017) and induction coaching (Young et al., 2017), which were the instructional coaching frameworks used in the intervention group in this study. According to an exploration of the student-centered coaching website (Sweeney,

2019), there is a gap in published research supporting a difference in student scores in reading comprehension with and without student-centered instructional coaching. According to the New Teacher Center (Young et al., 2017), teachers receiving 2 years of induction coaching had students that showed some gains in reading achievement, approximately 2 to 3.5 months when compared to students in a control group.

Instructional coaching is a universal practice being implemented K–12 in school districts across the nation to improve professional practices with the intent of higher student achievement (Coburn & Woulfin, 2012; Garcia et al., 2013; Perkins & Cooter, 2013; Sailors & Price, 2015). It is a means to increase student achievement, which has been proven effective in literacy through weekly literacy coaching (Perkins & Cooter, 2013), through coaching in a middle school (Garcia et al., 2013), and through a combination of directive coaching (a focus on comprehension instruction) and responsive coaching (Sailors & Price, 2015). Although there are many research studies focused on literacy coaching models (Kraft et al., 2018), there is little research on the implementation of instructional coaching and the difference in student reading achievement. Student-centered instructional coaching and induction coaching are general instructional models designed to be used across any content area with the intent of increased student achievement.

Purpose of the Study

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement. Instructional coaching served as the independent variable and reading achievement served as the dependent variable. An

analysis of variance (ANOVA) using aReading scores was used to investigate the effects of instructional coaching on reading comprehension during periods with instructional coaching (intervention group) and without instructional coaching (control group). The design of this study was a repeated measures group comparison within/between interaction.

Research Question and Hypotheses

Derived from what was presented above, the following research question was addressed:

Research Question: What is the effect of instructional coaching on third-grade reading achievement?

$H_0$1: There was no statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.

H_a1: There was a statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.

Theoretical Framework for the Study

Walberg's theory of achievement was the theoretical framework that provided a foundation for this study on instructional coaching and student achievement. Walberg (2010) described how students learned. In his study, he explained how family, classroom, and school practices help students to learn more. Included in his research was the delineation between constructivism (the concept of students discovering their

understanding) and instructivism (teachers employing well-defined objectives around the well-defined subject matter, lesson planning with an explicit assessment of progress, and a provision of reteaching and additional practice). The main question asked by Walberg in his research was: Do the means employed in classrooms result in academic achievement? To answer this question, Walberg discovered behaviors of professionals that could help all students succeed. An examination of instructional coaching models provided a glimpse into specific components researched by Walberg that could influence student achievement.

Walberg (2003) synthesized statistical analyses and large-scale surveys to reveal the causes of achievement. Included in the factors that cause academic achievement are the quantity and quality of instruction which are the focus of instructional coaching. In this study, the difference in student achievement with instructional coaching and without instructional coaching was explored in two rural school districts. Student-centered instructional coaching (also called student-focused) and induction coaching were used in the intervention group. Student-centered coaching was defined by Diane Sweeney (2011) as "focused on collaborating with teachers to design instruction that targets student outcomes" (p. 1). Sweeney (2019) described student-centered coaching as one which occurs in clearly defined cycles that include coaching in small groups, pairs, or individuals. The student-centered instructional coaching process includes the selection, by the coach and teacher, of standards and learning targets to set up a student-learning goal for the coaching cycle. A coaching cycle occurs from 4–6 weeks during one unit of study and includes weekly planning sessions. The coach is in the classroom at least 1–3

times during the week. In the beginning, a standards-based goal is set for the coaching cycle aligned to the unit of study, learning targets serve as a measurement of success, and formative assessment is used to measure progress. In the middle of the coaching cycle, coplanning and coteaching occur to monitor and adjust the implementation of effective instructional practices. At the end of the coaching cycle, post assessments take place to determine student growth and identify the next steps for the students who did not show mastery of the learning targets. Induction coaches also are provided guidance by trained coaches using formative assessment tools to shape the coaching process. In this type of coaching, teachers who have been in the classroom one to two years are provided with an induction coach. The coaching cycle is focused on teacher practices within instruction. The process in both coaching types aligns with Walberg's theory of achievement (2010) around instructivism—teachers employing well-defined objectives around the well-defined subject matter, lesson planning with an explicit assessment of progress, and a provision of reteaching and additional practice.

Walberg's research on categories leading to academic achievement included cooperative learning, setting goals and providing feedback, and generating and testing hypotheses (Walberg, 2003). These categories coincide with best practices for instructional coaching. Hanover Research (2015) provided an overview of best practices for instructional coaching including an overview of student-centered instructional coaching. Hanover's results in best practices for instructional coaching included instructional coaching that is teacher-centered, relationship-centered, and student-centered. He merely reported a summary of the three types with no data to support one

over the other. Hanover Research (2015) defined the student-centered instructional coaching model as a model where a "coach partners with teachers to design learning that is based on specific objectives for student learning, the work is focused on data and student work, formative assessment data and student work is used to determine how to design instruction, and the coach is viewed as a partner who is there to support teachers to move students towards mastery of the standards" (p. 11). Boehle (2014), Sweeney (2011), Sweeney and Harris (2017), and Sweeney (2018) published extensive work focused on the student-centered coaching model but provided no quantitative data to support its effect on student achievement. All descriptions of student-centered instructional coaching proposed by Sweeney, Harris, and Boehle had the same definition of student-centered coaching, with the same principles found in the study by Hanover Research (2015), as well as the components found in Walberg's theory of achievement.

Induction coaching is considered teacher-centered coaching with the focus on a coach moving a teacher towards implementation of instructional practices. According to Hanover Research (2015), feedback is provided to assure the teacher is accountable for a set of instructional practices. To assist teachers new to the field, induction coaching provides the support in the areas of cooperative learning, setting goals and providing feedback, and generating and testing hypotheses (Walberg, 2003).

Walberg (2003) analyzed effects of quality of instruction, stating engagement as a key component in elements of instruction, goal setting as a key component in teaching techniques, and feedback as a key component in staff development. These effects are found by other researchers as key components in instructional coaching. Boehle (2014)

found that the most valid coaching program evaluation included an examination of teacher reflective tendencies, student performance, and long-term changes in habits related to instruction. Sweeney and Harris (2017) designed the student-centered results-based tool to provide ongoing documentation of pre-testing and post-testing, implementation of strategies/methods, and reflections by teacher and coach. Formative Assessment System for Teachers™ (FAST™) testing data was used to measure student performance, another characteristic for evaluating a program as described by Boehle. Weimer (2013) researched extensively on the topic of learner-centered teaching with the identification of five key principles. Those key principles of learner-centered teaching included engaging students in learning, providing explicit skill instruction, encouraging student reflection on the learning, providing the learner with some control over learning processes, and encouraging collaboration. Instructional coaching places both students and teachers in the learner role incorporating all five of these key principles. Induction coaching provides explicit skill instruction and encourages a collegial relationship between teacher and coach.

Walberg (2003) analyzed school level influences on achievement. Highest effect sizes were found when schools provided an opportunity to learn, time for learning, and monitoring the learning. These influences are key within instructional coaching. Hasbrouck (2017) referred to student-centered coaching as student focused. He explained how the student-centered coaching model separated from teacher evaluation with a focus on assisting teachers to be as effective with students as possible, moving it away from an evaluative focus of changing teacher practices. The centerpiece of student-centered

coaching (as well as induction coaching) is on supporting effective instructional practices with a mutual focus on student achievement.

Hasbrouck (2017) pointed out that instructional coaching was first developed in the 1990s as a process called responsive consultation which began in the areas of special education and school psychology. Responsive consultation provided a shared sense of ownership of a problem, and the development of an intervention to address the problem. According to Hasbrouck (2017), peer coaching (Joyce & Showers, 1995) and effective professional development strategies (Gulamhussein, 2013) have impacted instructional coaching, a foundation upon which both student-centered coaching and induction coaching were built. A more detailed explanation of the theoretical propositions related to instructional coaching will be explained in Chapter 2.

Nature of the Study

The research in this study contributed to an understanding of the gap in the literature related to student achievement with instructional coaching and without instructional coaching. The comparison groups were an intervention group—third graders receiving instructional coaching—and a control group—third graders not receiving instructional coaching. The research of this kind can provide school districts with a comparison of student achievement with and without coaching and help provide data related to instructional coaching to improve student achievement.

Using archival data through Adaptive Reading (aReading) scores provided an opportunity to examine reading achievement across an entire school year. In the state where this study took place, this assessment is required to be implemented three times a

year in all school districts grades K–3. The data used a control group and an intervention group focusing on reading achievement measured by aReading. The school district selected for this study with the intervention group implemented student-centered instructional coaching during the 2018–2019 school year while also providing induction coaching for teachers in their first or second year of teaching. This district provided archival data for third-graders with instructional coaching (intervention group). The control group from a different school district provided archival data for the 18 weeks where no instructional coaching was implemented.

This study used archival data measuring third-grade reading achievement from third-grade students during the 2018–2019 school year. Data from the Assessment FAST™ on the Adaptive Reading assessments (Christ et al., 2013) was used with two groups – those not receiving instructional coaching and those receiving instructional coaching. A repeated measure mixed ANOVA was used to determine (a) differences within each group over time, and (b) differences between groups.

In summary, this quantitative study focused on the effect of instructional coaching on student achievement. Archival data was used to measure third-grade reading achievement during the 2018-2019 school year using a control group (without instructional coaching) and an intervention group (with instructional coaching) with student achievement as the independent variable and instructional coaching as the dependent variable. Repeated measures mixed ANOVA was used to determine the effects.

Definitions

Student achievement was defined as the scores on the Formative Assessment by Teachers for Students–Adaptive Reading assessment (aReading). Instructional coaching served as the independent variable and achievement scores were compared for a control group and an intervention group. Reading achievement served as the dependent variable and were measured to determine if there is a significant difference in achievement between the intervention and the control group using pretest and posttest scores from fall to winter testing. Search terms included instructional coaching, student-centered (student-focused) coaching, induction coaching, student achievement, data-driven instructional coaching, problem-solving, evidence-based practices, high stakes testing, and low stakes testing. Definitions, as used in this study for these terms, include:

Instructional coaching: A relationship between a teacher and a coach who learn together through a collaborative partnership by improving instruction and student achievement (Knight, 2006).

Student-centered coaching: Coaching that is primarily grounded in problem-solving and provides instructional consultation; also known as student-focused instructional coaching (Denton & Hasbrouck, 2009); includes documentation of data measuring progress on learning targets, instructional strategies implemented, teacher reflection, and coach reflection (Sweeney & Harris, 2017).

Induction coaching: Coaching provided to first-year and second-year teachers, offering mentoring using instructionally focused high-leverage tools; mentoring is

focused on improved teacher practice, teacher retention, and improved student outcomes in ELA and math (Schmidt et al., 2020).

Data-driven instructional coaching: Decisions made using assessment data and student work to plan for instruction (Glover et al., 2019).

Evidence-based practices: Educational practices that have a history of effectiveness supported by scientific research (RTI Action Network, 2019).

High stakes testing: Attaching consequences to standardized test scores and creating pressures on teachers for students to pass standardized tests (Nichols & Brewington, 2020); school ratings are attached to the performance on these tests.

Low stakes testing: Testing used to measure academic achievement, identify learning problems, or inform instructional decisions (Finn, 2015).

FAST: Formative Assessment System for Teachers administered three times per year in each district in the state of this study to monitor reading and math achievement (FastBridge Learning, 2016, 2020).

Assumptions

One of the aspects of this study that was assumed was similarity in the delivery of the aReading assessment by third-grade teachers in both districts. This study cannot demonstrate that the delivery of this assessment was in the same way between districts and between third-grade teachers in each district; however, it was assumed that delivery was the same based on the directions given by the assessment company. Since the assessments for aReading were given in each district, the similarity in delivery of assessments was assumed. Another aspect of this study that was assumed was the

delivery of instructional coaching. It is assumed that the instructional coach worked with each of the teachers and classes in the same way, using the components of instructional coaching with all teachers in the intervention group involved. The delivery of instructional coaching is not being researched in this study, only the results of coaching based on reading achievement data, so the delivery of instructional coaching was assumed. Both student-centered instructional coaching and induction coaching have specific procedures outlined for their implementation, and it was assumed these procedures were followed.

Scope and Delimitations

In scope and delimitations, internal and external validity will be described for this study. A description of the population and timeframe will also be included.

Internal and External Validity

Surbhi (2017) defined both internal and external validity. Internal validity is the ability to conclude the effect of the independent variable on the dependent variable. It is the extent to which the researcher can make the claim that no other variables except the one studied caused the result. External validity is the ability to make inferences on the population at large. In this study, the control group consisted of 80 students and the intervention group consisted of approximately 101 students. These groups were both from the same instructional period (the first 18 weeks of school) and the same grade level (third-grade). The control group was assessed during the first 18 weeks of school when there was no instructional coaching. The intervention group was assessed during the first 18 weeks of school when instructional coaching took place. Reading achievement was

measured by progress on aReading, which is required to be given three times per year in both school districts—fall, winter, spring.

This research was a single study with third-grade readers. The current research related to theories of achievement were applied to the components of instructional coaching. This was meant to be a single study to provide districts with a comparison of students who have received instructional coaching and those who have not. This study can provide a research design model for districts to replicate as they examine the effect of instructional coaching on student achievement. The results of this study can be generalized and used by school districts to support or not support the implementation of instructional coaching. It is a study design that other school districts can use to measure the effect of instructional coaching on reading achievement.

Limitations

There were some limitations considered before this study took place. One problem considered was the mobility rate in the third-grade classroom. According to the G* Power analysis, this quantitative study required a sample size of 86 (Faul et al., 2007). For this study, there were a total of 181 third-grade students used. Careful attention was given to using the same students for all testing periods which could have reduced the number of students in the study, but it did not. The student names were removed by curriculum directors in both districts with numbers assigned for each student. Another challenge considered a limitation was the fact that there were different reading teachers. The same training was given each coach who provided coaching during the intervention time assuring consistency in the delivery of the coaching cycle; however, differences in

teaching abilities and classroom management could have influenced the assessment data; therefore, the results from each class by the type of coaching – student-centered and induction – were examined as well as the entire third-grade assessment results.

Biases That Could Influence Study Outcomes

The types of bias considered in this study were flawed study design, control biases, selection bias, outcome misclassification, and confounding (Pannucci & Wilkins, 2010). One type of bias is a flawed study design. To control biases in this study, standardized data collection took place through objective methods. Selection bias was controlled as all third-grade students in the population of the study were used in the research for both pretesting and posttesting data. Outcome misclassification was avoided using validated measures of student achievement – the aReading scores. Confounding was avoided through a strong study design - a repeated-measures mixed Analysis of Variance (ANOVA).

Significance

When proposing this study, the significance of this study was in its potential contributions and potential effect on social change. School districts that have implemented instructional coaching can benefit from additional studies on the effectiveness of coaching on reading achievement.

Potential Contributions

Instructional coaching has been adopted in all districts of the state where this study occurred. Instructional coaching intends to provide job-embedded professional development for classroom teachers with the main goal to enhance student achievement.

Because of the variety of instructional coaching models, there is a need to provide research studies that examine periods with and without instructional coaching and the effect on student achievement while identifying the type of instructional coaching used. Research using instructional coaching as the independent variable and student achievement as the dependent variable provided a measure of the effect on reading achievement with instructional coaching. The aReading scores for the intervention group were disaggregated in two categories of coaching – student-centered and induction. If an effect of instructional coaching on reading achievement was found, this study could provide school districts with evidence to support the implementation of coaching as an effective means towards improving student reading achievement.

Potential Social Change

As districts seek ways to improve student achievement, instructional coaching has been implemented. This research study provided input to districts on the difference in reading achievement between third-grade students with and without instructional coaching. If a statistical difference in reading achievement was found between students receiving coaching and those not receiving coaching, this study could offer a closer examination of potential for social change as districts adopt instructional coaching and specific coaching models to improve student achievement. This study adds to an understanding of the effect of instructional coaching on third-grade reading achievement. It serves as one study, however, the replication of this type of study could be done to measure the effect of instructional coaching on third-grade reading achievement.

Summary

Instructional coaching has been implemented in districts to improve student achievement. The problem addressed in this study is that school districts have implemented instructional coaching to improve student reading achievement, but the effectiveness is unknown. This study provided background on instructional coaching and how the theoretical framework of Walberg's theory of achievement related to instructional coaching. Student achievement was measured by third-grade reading scores using the aReading scores on Formative Assessment by Teachers for Students (FAST™) which is administered three times a year. Archival data included reading achievement during periods with instructional coaching and without instructional coaching. This data was analyzed to determine if there was a statistically significant difference in reading comprehension for third-grade students receiving coaching when compared to those not receiving coaching. Instructional coaching has a process where the coach and teacher determine the standard and learning targets for instruction, examine student work and assessment data, determine evidence-based instructional strategies to implement, carefully examine formative assessments to assure students are progressing, and end the cycle with an analysis of assessments and student work to determine student progress. As a measure of student reading achievement, this study included aReading data for instructional periods with instructional coaching and without instructional coaching to measure the effect of instructional coaching on student reading achievement. The next chapter will provide a review of the literature to support this study.

Chapter 2: Literature Review

Introduction

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement during an 18-week instructional period with instructional coaching as the independent variable and third-grade reading achievement as the dependent variable. Instructional coaching is implemented to improve student achievement (Kurz et al., 2017; Reinke et al., 2014), but studies support there is a gap remaining in the literature that quantitatively supports instructional coaching to improve student achievement (Coe et al., 2014; Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). The problem addressed in this study was that school districts have implemented instructional coaching for the purpose of improving student achievement; however, the effect of instructional coaching on student reading achievement is unknown.

Across the United States there has been pressure to improve instructional practices and student achievement based on policies and regulations adopted at federal and state levels. According to the Iowa Department of Education (2021), Every Student Succeeds Act (ESSA) was signed into law in 2015, a K–12 education law replacing NCLB. ESSA legislated school districts to develop comprehensive plans for accountability and support including challenging standards and assessments in every state. Federal policies and regulations from NCLB to ESSA led to the development of the Common Core standards which have influenced K–12 instruction (Kornhaber et al., 2017). To address improvement of instructional practices and student achievement, instructional coaching has been implemented in school districts to provide support to

teachers. Instructional coaching has emerged from trends in research on professional development focused on improving instructional practices (Freeman et al., 2017; Reddy et al., 2017). The improvement of instructional practices leading towards student achievement is the foundation of instructional coaching; however, there is little quantitative data that supports the effect of instructional coaching on third-grade achievement.

Quality coaching is based on collaboration between professionals, provides job-embedded professional development related to changes in instructional practices, and offers differentiated roles for teachers (Borman et al., 2006; Coburn & Woulfin, 2012; Crawford et al., 2017). The overriding goal of instructional coaching is to improve student achievement. Coultas and Salas (2015) reported that there are many approaches to coaching; however, little is known about the effectiveness of the various coaching approaches on student achievement. This study focused on instructional coaching, and its effect on reading achievement in third-grade students; in particular, data for the coaching approaches referred to as student-centered instructional coaching (SCIC) and induction coaching were examined.

Student-centered instructional coaching is also referred to as student-focused and is a form of coaching that is primarily grounded in problem-solving and instructional consultation (Denton & Hasbrouck, 2009). This form of instructional coaching is also referred to as the student-centered coaching (Sweeney & Harris, 2017). School districts have implemented the SCIC model to improve student achievement; however, the difference in student achievement with instructional coaching and without instructional

coaching is unknown. The action planning between teacher and coach found in SCIC during a coaching cycle is based on pretesting and posttesting of student achievement on learning targets. The goal of its implementation is the improvement of student achievement. This same goal is true for induction coaching. Induction coaching is used to provide support to first- and second-year teachers in the profession. This coaching provides mentoring in standards-aligned lesson planning, classroom observations to analyze evidence of effective practices, and analyzing artifacts of student work (Schmidt et al., 2020). To make data-based decisions when employing instructional coaching, there is a need for school districts to know the difference in student achievement with and without coaching. Student achievement can be measured by using the state-mandated assessments administered three times a year. The question is: What is the effect of instructional coaching on third-grade reading achievement?

Current literature has little quantitative research that specifically examines the effect of student-centered instructional coaching on student reading achievement. Borman et al. (2006) stated instructional coaching can be found along differing continua—consultative or directive, collaborative or supervisory, inquiry-focused or teacher behavior focused, peer-to-peer, or expert-to-novice. They found research on instructional coaching as being descriptive, using case studies, incorporating observations, and applying interview information with the treatment varying across settings, but aligning coaching to improved student outcomes was complex. They found that little literature emerged on cost-benefit studies related to coaching. In the literature review section of

this chapter, a detailed explanation will describe the gap in the literature regarding quantitative research on student achievement with and without instructional coaching.

This chapter begins with a restatement of the problem, purpose, and significance of this study. The theoretical framework which provides the lens through which instructional coaching was examined is Walberg's theory of achievement. This theory will be described by providing its origin, major theoretical propositions, and assumptions which are applicable concerning instructional coaching and its implications for this study. A focus in this study was on the process used in the SCIC model as outlined by Sweeney and Harris (2017) as well as induction coaching as described by the New Teacher Center (Schmidt et al., 2020). A description of how and why the selected theory relates to the present study and how the research questions relate to, challenge, or build upon existing theory will be provided. SCIC and induction coaching will be explained with their frameworks aligned with research-based practices and those components found in Walberg's theory of achievement. A literature review related to key concepts will be provided, and the chapter will end with a summary and conclusions related to this study.

This chapter will consist of the following major sections: explanation of the literature search strategy and scope of literature review; the theoretical foundation of Walberg's theory of achievement; the framework of the student-centered instructional coaching and induction coaching as well as key definitions and application; a literature review of key variables and concepts; and a summary with conclusions.

Literature Search Strategy

The accessed library databases used in this study included Education Source, ERIC, EBSCO, SAGE Journals, and ProQuest. Search engines used included Google Scholar, Walden Library, and Thoreau. Key search terms included instructional coaching, public policy and administration, Walberg's theory of achievement, student-centered coaching, student-focused coaching, induction coaching, student achievement, collaboration, data-driven instructional coaching, problem-solving, and effective teaching. The scope of the literature review focused on peer-reviewed articles from years 2014 to the present along with seminal articles and published works from the late 1900s to 2013. Other resources explored included state education agency websites, federal government websites and reports, instructional coaching websites, and interviews with administrators who oversee district instructional coaching. There is little current research on student-centered instructional coaching; therefore, the search was broadened to the terms student-focused instructional coaching and problem-solving coaching. From this point in the study, the term student-centered coaching will be used as a title for coaching that in research is referred to as either student-focused or student-centered. Induction coaching will refer to instructional coaching for first- and second-year teachers as they work to improve their teaching practices.

Theoretical Foundation

The effects of instructional coaching on reading achievement during periods with instructional coaching and without instructional coaching will be examined through the lens of Walberg's theory of achievement (also called the theory of educational

productivity). According to the seminal article by McGrew (2008), this theory is based on a review and integration of over 3,000 studies and is one of the few empirically tested theories of school learning. This theory describes environmental characteristics and student characteristics that studies have shown to improve student achievement. These characteristics will be described as well as how student-centered instructional coaching and induction coaching use these components within a coaching cycle.

Walberg's Theory of Achievement

McGrew (2008) provided a concept map of Walberg's model of educational productivity. In his seminal article titled "Model of Educational Productivity," Walberg (1981) described environmental characteristics influencing achievement, which included the quality of instruction, the quantity of instruction, home environment, and mass media. Walberg also described student characteristics—ability, motivation, class/social environment, and peers. When examining instructional coaching, the focus is on components described by Walberg as the quality of instruction. The quality of instruction includes clarity; matching tasks to student characteristics; use of cues, reinforcement, feedback, and correctives; clarity of instruction; task difficulty and pacing; and learning guidance. Student-centered instructional coaching and induction coaching implement the characteristics described by Walberg as the quality of instruction.

Instructional coaching is guided by a relationship between a teacher and a coach who learn together by improving instruction and student achievement (Knight, 2006). Today's education initiatives emphasize the need for instructional improvement through developing an educator's implementation of evidence-based practices (Kurz et al., 2017).

Evidence-based practices are employed to improve student learning, behavior, and/or attitude (Knight et al., 2015; Kurz et al., 2017; Woulfin & Rigby, 2017)). According to Walberg (1981), cognitive, behavioral, and attitudinal outcomes influence students and their environments, which influence both motivation, quality of instruction, and classroom climate. Courses that achieve high standards "align instructional content and methods to clear, well-specified, and measurable outcome standards" (Walberg, 2010, p. 74). This type of alignment is provided within a coaching cycle.

Instructional coaches provide collaborative learning opportunities with job-embedded professional learning focused on student outcomes, and research supports that learning opportunities are most effective when job-embedded and learner-centered (Mangin & Dunsmore, 2015; Spelman et al., 2016; Teemant, 2014). Coaches are active guides with teachers and serve as collaborative partners in the application of professional learning (Desimone & Pak, 2016; Reinke et al., 2014; Tanner et al., 2017). An effective coaching program is founded on collaboration between coach and teacher.

Instructional coaching is based on collaboration, using assessment as a guide for measuring student progress. Collegial relationships, pretesting and posttesting, strategy implementation, goal setting, and reflection are major components in the framework of SCIC and induction coaching. The strength of student-centered instructional coaching is in its use of ongoing formative assessment to measure its association between the model and student learning targets. Connor (2017) reported that coaching should not be evaluated through high-stakes evaluation as there are too many variables that can affect achievement on these annual assessments; therefore, in this study, ongoing formative

assessment related to student achievement will be examined. Teachers and coaches are active collaborators during the coaching cycle, using formative assessments and teacher observations to gauge the association between the coaching and student achievement. SCIC provides job-embedded professional learning through the implementation of coaching cycles with documentation of pretesting and posttesting data measuring progress on standards-based learning targets, instructional strategies implemented, and reflection by teacher and coach. Induction coaching focuses on teacher practices, lesson planning, and reflection on practices. The connection to quantitative data as a measure of student achievement is needed to accurately measure the effect of instructional coaching.

Walberg (2010) described the use of experiments when determining if the mean causes the end in a question. He stated that experiments in K-12 education are rare, however, statistically controlled studies where students are assigned conditions or practices and compared with respect to their learning can provide insight to educational practices. In this study, the reading achievement of third-grade students was compared under the condition of no instructional coaching (control group) and with instructional coaching (intervention group).

Herbert J. Walberg began his research in the field of psychology with his work on student achievement coming from behavioral psychology. His work emphasized objective observation and measuring desired behaviors or outcomes. The focus of his work has been on describing how students learn and how changes in organizations can affect student learning especially in the areas of family, classroom, and school practices.

In this study, practices within a classroom and school through instructional coaching were examined as districts sought to improve student achievement.

Walberg et al. (1986) described nine factors outlined by Walberg's theory of educational productivity that optimize student achievement:

> (a) ability or prior achievement, (b) age, (c) motivation or self-concept as indicated by personality tests or willingness to persevere on learning tasks, (d) quantity of instruction, (e) quality of instructional experience; and educationally stimulating psychological aspects of the (f) home environment, (g) the classroom or school environment, (h) the peer group environment, and (i) the mass media. (p. 133)

These nine factors were a result of an extensive synthesis of 3,000 studies of student learning. Their report emphasized that no factor could serve as a solution to student achievement, but there is value in improving all productive factors, if possible, by human time and effort. With the employment of instructional coaching, human time and effort is expanded as teacher and coach focus on quantity and quality of instruction by enhancing the classroom and school environment. Coaching also develops a partnership of peer collaboration that adds value to the peer group environment of a school.

Application of the Theory

The application of Walberg's theory of achievement leads towards a closer examination of the student-centered instructional coaching and induction coaching which include the use of formative assessment enhancing the quality and quantity of instruction in a classroom. Benjamin Bloom's mastery learning research used formative assessment,

based on learning goals, and was used to provide feedback on student learning. Bloom's work emphasized the need to provide corrective activities to assist with the mastery of learning skills, while those who showed mastery of the skills were provided with enrichments to further their depth of learning (Bloom, 1976). Guskey (2019) researched the most effective types of feedback, which was needed to inform students on where they were performing and how to improve. Formative classroom assessments provide feedback to students on their learning progress, and through them students can determine how to improve. In SCIC and induction coaching, formative assessment provides the teacher with feedback on the effectiveness of instructional practices and provides the impetus to vary those practices to assist with student achievement. It is an integral part of the action planning to improve quality and quantity of instruction, a key component in Walberg's theory of achievement, that occurs in a coaching cycle between the teacher, the coach, and students.

In their research on formative assessment, Black and Wiliam (2009) conceptualized the following five key strategies found in effective formative assessments:

1. Clarifying and sharing learning intentions and criteria for success.
2. Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding.
3. Providing feedback that moves learners forward.
4. Activating students as instructional resources for one another.
5. Activating students as the owners of their own learning. (p. 8)

They emphasized the three major components of teaching and learning including learning goals, instruction, and competent learners whose learning can be measured by assessments with learning alternatives provided to those not showing mastery.

SCIC is based upon clarifying learning intentions and establishing criteria for success followed by creating an action plan that is based on learning tasks to assure student understanding. Formative assessments are used to provide feedback to students to move their learning forward through the employment of a variety of instructional strategies to assure learner success. Informal assessment data is used to document the results of the instruction as measured by learning targets. Induction coaching is provided to teachers in their first two years of teaching through mentoring by a trained coach with a focus on improving teacher practice. The intent of this study was to use state required assessment data through aReading that will add to the quantitative data on student achievement with instructional coaching and without instructional coaching.

Rationale for the Selection of Theory

The Walberg's theory of achievement focused on quality of instruction to enhance student achievement. Both student-centered instructional coaching and induction coaching have the following components (Schmidt et al., 2020; Sweeney, 2011; Sweeney & Harris, 2017) which directly focus on this area of quality of instruction:

- *Positive interdependence* – The coach and teacher have clear goals, and they encourage one another to attain the goals.
- *Individual accountability* – Each member has a task to which they are responsible for completing to meet the goal.

- *Promotive interaction* – Resources and ideas are shared.
- *Social skills* – Effective communication and trust are necessary.
- *Group processing* – Discussions are focused on concerns and celebrations as they strive to meet the goal.

Association of the Theory to the Research Question

The components found in Walberg's theory of achievement support the association between the coaching cycle and student achievement found in student-centered instructional coaching and induction coaching. To determine the association between these two types of instructional coaching and student achievement, this study is designed around the following research questions:

Research Question 1: What is the effect of instructional coaching on third-grade reading achievement?

$H_0$1: There is no statistically significant difference in reading achievement between third grade students with and without instructional coaching.

H_a1: There is a statistically significant difference in reading achievement between third grade students with and without instructional coaching.

An understanding of the difference in third-grade student achievement with instructional coaching and those students without coaching will help districts with decision-making regarding the implementation of effective instructional coaching. Student-centered instructional coaching and induction coaching consistently keep at the forefront a focus on student outcomes that support teachers using formative assessment and is founded on components of the Walberg's theory of achievement.

Instructional Coaching

In this part of the study, both student-centered instructional coaching and induction coaching will be described. The history of instructional coaching along with success factors and key ingredients found in both types of coaching will be outlined. Key statements and definitions will be provided. Concepts and benefits found in previous research will also be given.

Student-Centered Coaching and Induction Coaching

Currently, there are several types of instructional coaching adopted and implemented in school districts today. The focus of this study was student-centered instructional coaching and induction coaching. This section will explain how these instructional coaching components found in these types of coaching align with research. Research provides information on active ingredients found in instructional coaching and success factors needed for successful instructional coaching, all of which are present in student-centered and induction coaching. This section will provide a historical perspective of instructional coaching and describe active ingredients found in instructional coaching along with success factors for effective coaching. Primary writings will be reviewed, key definitions will be noted, and benefits of the student-centered and induction instructional coaching frameworks will be summarized. Figures 1 and 2 provide pictorials of student-centered instructional coaching and induction coaching including their key components and a question on their relationship to student achievement. This study also focused on the relationship between the control group

without coaching and the intervention group with coaching and included both types of coaching.

Figure 1

Pictorial of Student-Centered Instructional Coaching

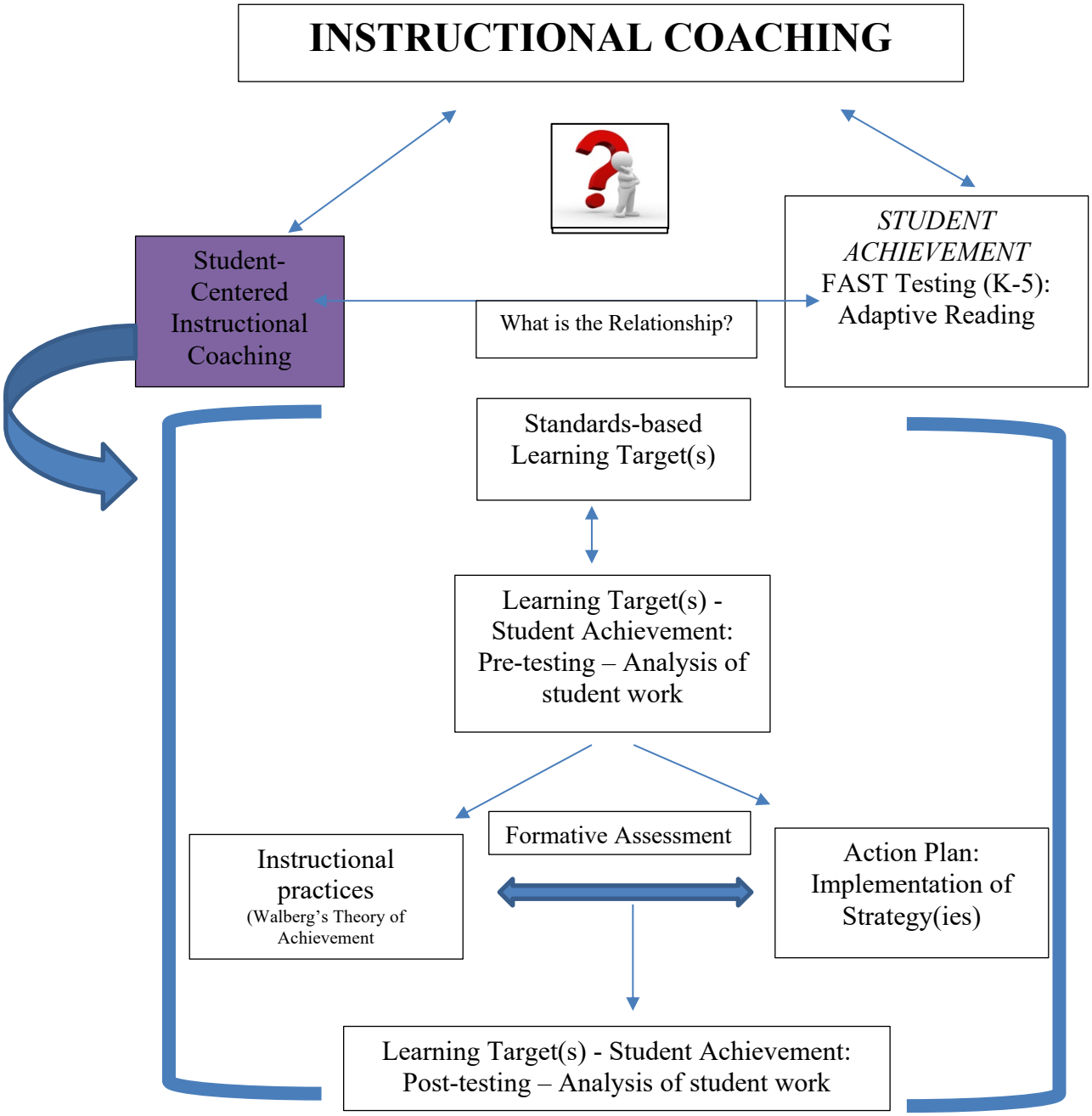
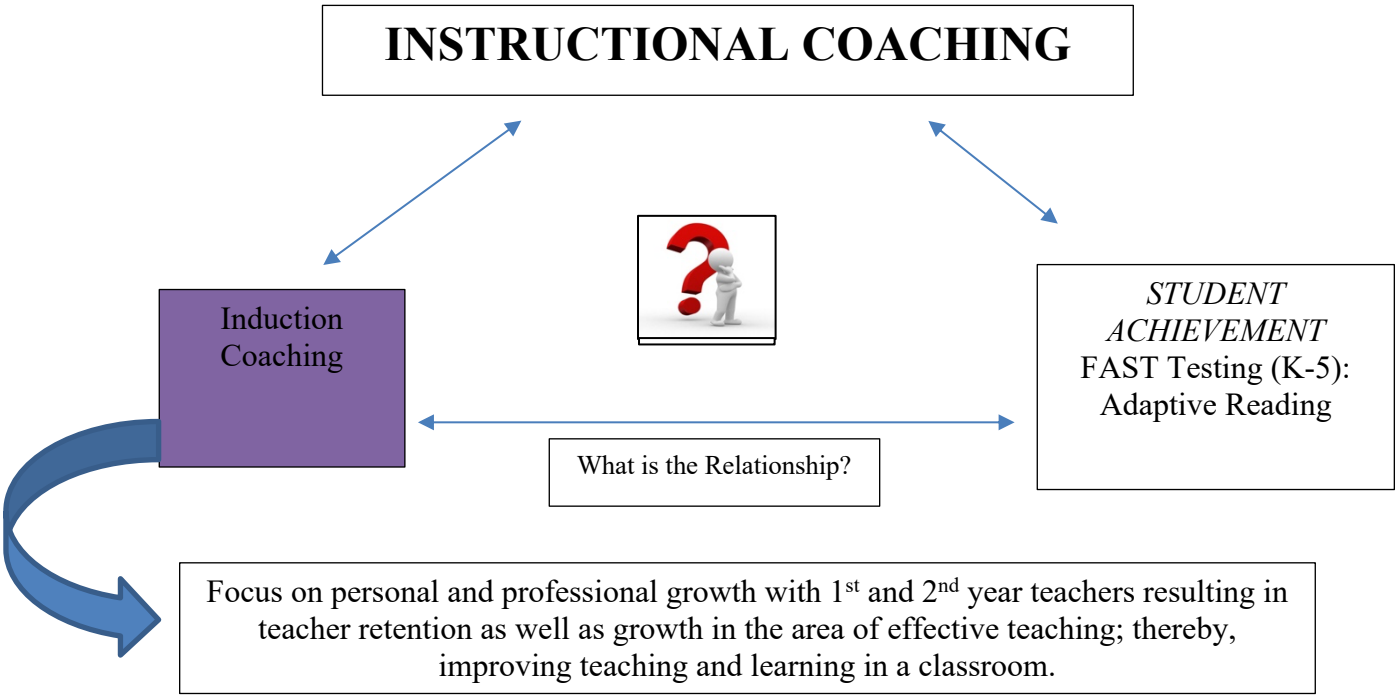


Figure 2

Pictorial of Induction Instructional Coaching



History of Instructional Coaching

Instructional coaching research began in the 1980s. Joyce and Showers (1980) are cited as providing some of the first empirical evidence that peer coaching could change practices through the support provided to teachers in professional development. The focus of their work was on the training and implementation of school-selected initiatives and their effect on students. Showers and Joyce (1996) described the history of peer coaching beginning with pre-1980 where training and implementation were not closely examined. It was just assumed that upon receiving professional development, teachers returned to classes and implemented the strategies. In the 1980s, it was found that the most effective teacher training design included modeling, practice, application in the

classroom, and feedback with the presence of coaching. This was proven to provide greater retention and use of strategies. In the 1990s the focus turned to advocate that schools provide collaboration time within the school day for teachers to work as a team towards shared goals. Killion (1999) researched staff development and what learning experiences were the most worthwhile. Successful staff development guided teachers in understanding content and effective instructional practices; however, for teacher learning to occur, a supportive environment had to be provided. Research by Joyce and Showers (1995) showed that coaching helped to provide that supportive culture.

When considering the development of instructional coaching, Knight (2018) believed the birth of today's instructional coaching grew out of a study done at the University of Kansas in 1996. That study focused on inclusive teaching practices for special needs students in technology classes. The research group realized the kind of support being given to teachers in the study should always be provided. Those providing support were given titles—first called learning consultants, then instructional collaborators, and most recently, instructional coaches.

Knight (2009) described the effect of the federal legislation in 2002 known as No Child Left Behind (NCLB), which created more accountability in schools through the establishment of Annual Yearly Progress (AYP) goals. The AYP goals were then to be published to notify the public of school progress towards achieving those goals. Because of this legislation, administrators began to pay closer attention to student achievement data and how teachers learned and applied instructional practices presented in traditional professional development sessions. According to Knight (2009), Bush found only an

implementation rate of 10% following traditional professional development.

Instructional coaching developed from the failure of traditional professional development to affect instruction. Knight (2009) stated, “when teachers receive an appropriate amount of support for professional learning more than 90% of them embrace and implement programs that improve students’ experiences in the classroom” (p. 5). According to Knight, traditional professional development does not result in sustainable change due to three reasons: (a) too many responsibilities requiring immediate attention; (b) too many initiatives being implemented at one time; and (c) making change is complex. To overcome these three roadblocks to sustainable change, he believed instructional coaching was one method to help teachers improve instructional practices resulting in student learning. It is through collaboration teachers feel supported in their responsibilities, work toward implementation of initiatives, and participate in making changes in their instructional practices.

Induction coaching focuses on personal growth and professional practices of first- and second-year teachers. Induction coaching is based on “trust, empathetic listening, safety, mutual respect, curiosity, and confidentiality (Hollweck, 2017). This form of coaching focuses on providing support for first- and second-year teachers to grow professionally through the implementation of effective teaching practices. This type of coaching is teacher-centered (Hanover Research, 2015) and is centered around goals determined by observations of teaching practices. Goals are set to improve the implementation of teaching practices, and those goals are guided by a suite of tools used during the coaching cycle.

Student-centered instructional coaching goes one step further than simply a focus on improving instructional practices. It focuses on student work first, uses pre-testing as a baseline of student achievement, followed by creating an action plan for instructional practice implementation. This type of coaching embeds time for revision of the practices based on student performance, with post-testing as a measure of the association between the coaching and student achievement (Sweeney, 2011). This study focused on student achievement and the effect of improved instructional practices through coaching.

Active Ingredients found in Instructional Coaching

White et al. (2015) conducted a qualitative study to answer the question—*What active ingredients are found in instructional coaching*? The researchers used data from existing coaching literature as well as coach and teacher data collected through surveys and interviews. They found support for the development of a coach-teacher relationship involving rapport, respect, trust, and feedback. They also found the importance of administrative support to make coaching available. In their study, they found the requisite stages of the instructional process included joint planning, an action/practice stage including observation, individual reflection, feedback, and reflective discussion (White et al., 2015). The student-centered instructional coaching model embodies joint, collaborative planning as coach and teacher focus on a standard and collect pre-teaching data of student performance related to the standard's learning targets. Sweeney (2011) explained that the coaching cycle is based on identifying learning targets aligned to a standard, evidence-based strategies for guiding the learning are determined, and an action plan is developed. The coach and teacher determine the role of the coach when the coach

is present in the classroom. Observation, reflection, and feedback are part of the coaching process as reflective discussion helps to guide revisions to the plan. Post-teaching data is collected regarding mastery of the standards. All stages of the coaching cycle are documented in the results-based teaching tool (Hanover Research, 2015; Sweeney, 2011; Sweeney & Harris, 2017), which guides the coaching process. Induction coaching provides "professional learning opportunities and a structure for teachers to share their experiences and build relationships" (Hollweck, 2017, p. 11). The framework for student-centered instructional coaching and induction coaching and their components align with the research by White et al. (2015) as to the active ingredients found in instructional coaching.

Kurz et al. (2017) explored coaching literature in education and based on the literature created a multidisciplinary framework from which coaching models can be developed. It is portrayed in the form of a cube as a content-neutral framework with dimensions that can be applied with variance by coaches. The three main foci include:

- Skills - coaching targets
- Process - the progression of activities
- Development - growth towards achieving personal or professional goals (Kurz et al., 2017, p. 74).

The actions of instructional coaches include "questioning, assessing, observing, goal setting, planning, collaborating, modeling, monitoring, promoting reflection, critiquing, evaluating, and adjusting" (p. 73). Coaching outcomes include: "performance enhancement, environmental improvement, community development, promotion of

autonomy, personal well-being, and organizational effectiveness" (Kurz et al., 2017, p. 73). When this is compared with the Sweeney and Harris (2017) student-centered instructional coaching model and the New Teacher Center (Young et al., 2017) induction coaching model, the three main foci align with the coaching cycle.

The student-centered coaching model aligns with the multidisciplinary framework created by Kurz et al. (2017). In SCIC, the actions of the instructional coach are determined by the goal based on student data, the evidence-based strategies for implementation are determined, and an outline of the role the coach will play in the classroom is documented on the results-based teaching tool. According to Sweeney and Harris (2017), skills, processes, and development are articulated and assessed throughout the student-centered coaching cycle.

Induction coaching also aligns with the multidisciplinary framework created by Kurz et al. (2017). During induction coaching, the actions of the instructional coach are based on observations of the teacher as aligned with effective teaching components. A common set of mentoring tools are used to guide the coaching cycle as well as formative assessment tools and an online mentoring platform. Induction tools focus on "key phases of instruction, including planning lessons aligned to standards, designing and delivering engaging instruction that supports equitable access to the content for all students, and formative review of student data to inform future planning" (Schmidt et al., 2020, p. 4). Induction coaching is focused on teachers and their practices.

Success Factors for Instructional Coaching Programs

Knight (2019) and the Instructional Coaching Group collaborated with more than 20,000 instructional coaches. Their research resulted in the identification of seven factors needed for coaches to be successful:

> (1.) Understand the complexities of working with adults; (2.) Use an effective coaching cycle; (3.) Know effective teaching practices; (4.) Gather data; (5.) Employ effective communication strategies; (6.) Be effective leaders; and (7.) Be supported by their schools and district. (Knight, 2019, p. 27).

Knight's coaching cycle was viewed as a relationship instructional coaching model (Hanover Research, 2015) as it emphasized the development by the coach of a strong relationship with the teacher. However, through research, Knight and his colleagues, using research design, have made changes to their original relationship instructional coaching model. In work by Knight (2018) and Knight (2019), an emphasis was placed on the need for the coaching goal to be student-centered.

Knight's concept of student-centered coaching led to the creation of a coaching cycle with three stages. Stage 1 is the *identify* stage, which involves creating a clear picture of reality for the classroom; setting a student-centered goal with student achievement, behavior, or attitude; and identifying a teaching strategy to use. Stage 2 is the *learn* stage where the teacher learns the strategy with the support of the coach. Stage 3 is the *improve* stage where the new strategy is implemented, and revisions take place as needed until the goal is met. These three stages are present in the SCIC model; however, Sweeney's student-centered coaching also includes documented reflection by both the

coach and teacher, along with pre-testing data and post-testing data to assure the work is student-centered and standards-aligned (Hanover Research, 2015). The examination of student work and pre-testing data occurs in the *identify* stage. In the *learn* stage, a strategy or strategies are selected for implementation based on student evidence. In the *improve* stage post-testing and reflection lead to revisions and adjustments for meeting the student-centered goal. SCIC emphasizes a focus on student learning with the emphasis on changing instructional practices based on student performance. It values the relationship between the coach and teacher, but the focus is student performance. Induction coaching focuses on teaching practices with the purpose that the implementation of effective teaching practices will lead to student achievement (Schmidt et al., 2020). From research, it is evident there is still a need for quantitative data that measures the difference in student achievement as measured on state-mandated assessments during periods with instructional coaching and without instructional coaching.

Key ingredients of Student-Centered Coaching

In her work with student-centered instructional coaching, Sweeney (2007) defined coaches as "those who work alongside teachers to ensure instruction is targeted to meet student needs" (p. 39). The student-centered coaching model is consistently focused on what students are doing in the classroom. Sweeney and Harris (2017) describe student-centered instructional coaching as being based on seven core practices:

(1.) Organizing coaching through cycles; (2.) Setting goals for coaching cycles; (3.) Using standards-based learning targets; (4.) Using student evidence to co-plan

> instruction; (5.) Co-teaching with a focus on effective instructional practices; (6.) Measuring the impact of coaching on student and teacher learning; and (7.) Partnering with the school leader. (p. 3–4)

The use of formative assessment to assess, plan, and teach is fundamental to student-centered coaching.

Summative and high stakes testing are not used to guide coaching cycles; rather student performance and student work based on standards-aligned learning targets serve as the guide. According to Hasbrouck (2017), the student-centered coach must serve as a facilitator, teacher/learner, and collaborative problem-solver. The focus is always on student success. With the coach serving as a facilitator, the opportunity is provided for growth through mutual support and respect along with developing a positive, trusting relationship. As a teacher/learner, the coach is to model commitment to student success. As a collaborative problem-solver, the coach guides the partnership between coach and teacher in a process to address student needs. The question remains: What is the effect of instructional coaching on student achievement?

Student-centered instructional coaching (SCIC): “increases motivation to change, catalyzes collaboration, enables focus, and stimulates continuous learning” (Stroh, 2014, p. 35). This form of instructional coaching focuses on a coach and teacher collaborating for the benefit of the student as they seek to enhance student achievement related to learning targets developed from standards. The focus is on the student and what is learned. Central to this instructional model is student self-efficacy as students organize and execute actions required to learn and master tasks, as well as teacher self-efficacy as

the teacher seeks to enhance instructional practices (Olivier et al., 2019). Self-efficacy has proven to create improved student achievement (American Society for Horticultural Science, 2011). Student self-efficacy leads to motivation which is one of the nine components cited by Walberg to enhance student achievement.

Key ingredients of Induction Coaching

According to Bastian and Marks (2017), the goals of induction coaching assist first- and second-year teachers:

- To acquire knowledge and skills in the areas of quality of instruction.
- To increase student achievement.
- To retain these novice teachers in the teaching profession.

The New Teacher Center (2018) provides teacher induction program standards for mentors and beginning teachers. High-leverage formative assessment tools are used to gather data related to practice. This is used to guide coaching cycles in improving instruction. Coaches support teachers in developing goals based on "context, content focus, formative data of practice, and developmental needs in alignment with district instructional priorities" (New Teacher Center, 2018, p. 19). Induction coaching is a framework focused on effective teaching practices.

Primary Writings of Instructional Coaching

The student-centered instructional coaching model is also referred to as student-focused. Key theorists who have studied the student-centered instructional coaching model include Boehle (2014), Denton and Hasbrouck (2009), Sweeney (2011), Sweeney

and Harris (2017), and Hasbrouck (2017). Their primary writings will be summarized and aligned with the student-centered coaching model.

A study by Boehle (2014) stated standardized test scores reflect the total impact of all professional learning and not just that of coaching. Therefore, to measure the relationship of coaching to student achievement, a method of measurement must move away from a one-time high-stakes assessment such as annual achievement data. It is not reliable in measuring the association of coaching to student achievement, because other initiatives also are part of that testing score. Boehle found that student evidence provided tangible measurement of a teacher's work grounded on reality and not emotion. One of the key components of the student-centered coaching model is the use of student work as evidence to observe what students are learning. The evidence is based on learning targets developed from standards, using formative assessments to measure progress with pretest and posttest data as a measure of achievement. In this study, another layer of assessment will be analyzed using state-mandated assessments in reading comprehension administered three times per year. A comparison of data between periods without instructional coaching (control group) and data of periods with instructional coaching (intervention group) can add to the body of knowledge related to the effect of instructional coaching on student achievement.

Denton and Hasbrouck (2009) stated that instructional coaching has been widely implemented; however, they noted the need for articulated theoretical and operational models of instructional coaching. They described the SCIC model as a "collaborative planning problem-solving process" (Denton & Hasbrouck, 2009, p.163). The teachers

and coach identify a targeted concern using data. An analysis of the data leads to the formulation of a problem, identification of goals, creation of an evaluation plan, and the development of a plan of action. These steps are evident in Sweeney and Harris's (2017) student-centered coaching approach. This model values data-based action planning and the use of student achievement on the mastery of learning targets to determine effectiveness; however, there is still a need for further quantitative research on how instructional coaching affects student achievement on state-mandated tests that assess achievement.

Work by Sweeney (2011) and Sweeney and Harris (2017) outlined a model framework for the implementation of student-centered coaching. The framework is found in the results-based coaching tool used to document progress from pretesting and post-testing, development of a plan of action, specific strategies implemented to improve student learning, and teacher/coach reflection related to student progress (Hanover Research, 2015). Collaboration is valued, but the focus is on student learning. The question remains how this type of coaching leads to achievement.

Hasbrouck (2017) described the focus of the student-centered coaching model as improving student outcomes. Using the work of Ingvarson et al. (2005) as well as Showers and Joyce (1996), Hasbrouck described this model as one based on a collaborative process focused on a need or concern while working collaboratively to achieve the desired end. It is a model that is not "top-down or evaluative but rather the coach serves as a facilitator, teacher/learner, and collaborative problem-solver" (Hasbrouck, 2017, p. 23). This student-centered model is specifically outlined by

Sweeney and Harris (2017), which provides a specific format for documenting the plan and the roles in a journey to improve student outcomes.

Key Statements and Definitions

Keywords, phrases, and definitions found in instructional coaching include student-centered, standards-based, evidence-based practices, coaching cycle, and reflection.

- Student-centered: Coaching is focused on what the student knows and what the teacher wants the student to learn; also referred to as student-focused (Sweeney, 2011).
- Standards-based: Learning targets defined by standards; in this study as outlined in the Iowa Core (Sweeney, 2011; Sweeney & Harris, 2017).
- Evidence-based instructional practices: Instructional practices supported by evidence and research that have been proven effective (RTI Action Network, 2019).
- Coaching cycle: the process followed by a coach and teacher using data, creating an action plan, reflection and revising, and using posttesting to improve student achievement (Sweeney, 2011; Sweeney & Harris, 2017).
- Reflection: the process of thinking over practices, analyzing how it was taught, and determining how the practice could be improved or changed for better outcomes (Sweeney, 2018).

Concepts and benefits found in previous research

Using the most recent research on instructional coaching, coaching has been researched using qualitative studies through teacher interviews, coach interviews, and observations of implementation of instructional practices (Bradley et al., 2013; Haneda et al., 2017; Hopkins et al., 2017; Mangin & Dunsmore, 2015; Reddy et al., 2017). Research supports the concept that instructional coaching is a way to support teachers in the implementation of effective instructional practices leading towards the enhancement of student achievement. There are a variety of studies that document student achievement growth in literacy through content area coaching, but there is little current research that measures the association between a generic instructional model (not content-specific) and student achievement. The SCIC model and the induction coaching models are generic instructional models meaning they can be used across all content areas in a variety of contexts.

Literature Review Related to Key Variables and Concepts

The literature review will focus on the gap in the literature as well as instructional coaching models and the selection of student-centered coaching as the focus of this study with mention of induction coaching. A review of Walberg's theory of achievement will be cited, and its application to student-centered and induction coaching will be described. A justification for the selection of the quantitative study design will be given. There will also be a justification of the variables in this study.

Constructs of Interest and Chosen Methodology

Recent research on instructional coaching and achievement showed limitations on data of the association between coaching and student achievement. Killion (2017) provided a meta-analysis of 37 studies on the positive effect of coaching on instruction and achievement. Killion noted the limitation of studies focused on general instructional coaching (such as the SCIC model) and measuring student achievement, stating the need for further research. Kurz et al. (2017) identified key coaching approaches and stated there was, "a lack of empirical evidence to directly substantiate the effects of coaching on the performance of students" (Denton & Hasbrouck, 2009, p. 67). They also stated the urgent need for additional research "to determine the efficacy of approaches in specific contexts and key components of coaching that lead to improved classroom practices and academic performance of all students" (Denton & Hasbrouck, 2009, p. 69). Coe et al. (2014) reported few studies that support any direct effect of external evaluation (i.e., articulated coaching cycles) for raising student achievement. Sweeney (2011) described professional development leader Thomas Guskey as saying, "Rarely changes in professional practice are considered, and rarer still is any assessment of the impact on student learning" (p. 8). Reddy et al. (2017) noted in their study limited tools for gathering quantitative data on teachers' instructional practices. In their study on productive coaching activities, Gibbons and Cobb (2017) noted that educators who intend to implement coaching programs have no body of research to turn to on effective coaching activities and practices. They found no prior work that specifies the most effective types of coaching activities. These studies support a gap in the literature around

a focus on the association between general instructional coaching (such as SCIC and induction coaching) and student scores through quantitative research.

Foster (2018) conducted a meta-analysis of the effect of coaching on instruction and achievement. The meta-analysis found that coaching had positive effects on teachers' instructional practices. "It is a foundational assumption in all coaching and other professional learning designs that … coaching improves instruction, which in turn improves student achievement" (Foster, 2018, p. 19). Foster (2018) also stated that researchers found that to have a positive impact on student achievement, there "needs to be a substantial change in teaching practice" (p. 19), leading to an improvement in instructional practices. There is still quantitative data missing on measuring the effect of instructional coaching on student achievement; therefore, this study was designed to examine the effect of instructional coaching on third-grade reading achievement by comparing an intervention group (receiving instructional coaching) and a control group (not receiving instructional coaching). It used a repeated measures group comparison research design.

What are Student-Centered Instructional Coaching and Induction Coaching?

Instructional coaching is a learning relationship between a teacher and a coach who learn together by improving instruction and student achievement (Knight, 2006). What makes the SCIC model unique is the coach and teacher partner to design learning based on standards-based learning targets with a focus on the student and learning to improve instructional practices (Reddy et al., 2017). Induction coaching is based on teaching practices (Schmidt et al., 2020) When comparing the two types of coaching,

induction coaching is collaborative problem-solving based on teaching practices, and SCIC is based on collaborative problem-solving between teacher and coach based on student needs. The Hanover Research (2015) cited seven components identified by the Kansas Coaching Project of effective instructional coaching implementation: teacher enrollment, collaborative planning, modeling the lessons, teacher-directed post-conference, observing the lesson, collaborative data exploration, and continued support. Both induction coaching and SCIC incorporate the seven components within coaching cycles. Additionally, SCIC focus is not on summative and high stakes testing but rather formative assessment data to extend learning in the moment or the next day of instruction (Sweeney & Harris, 2017). Boehle (2014) stated standardized test scores reflect the total impact of all professional learning and not just that of coaching, so to measure the association of coaching and student achievement a method of measurement must move away from a one-time high-stakes assessment such as annual achievement data. Boehle found that student evidence provided tangible measurement of a teacher's work and is used to determine strategies to implement to meet student needs. This study used low stakes testing (FAST™–Formative Assessment System for Teachers), not one-time high stakes testing, to provide data related to the effect of the instructional coaching on student achievement.

Support for implementation of student-centered instructional coaching and induction coaching can be found within the data-driven coaching model, which is similar to both coaching models. According to Glover (2017), the data-driven coaching model is based on the support of the teacher through problem identification by analyzing data,

problem analysis through the setting of measurable goals, implementing a plan, and then evaluating to adjust instruction. These components are included within induction coaching and SCIC. The focus of the data-driven coaching model is on improving instructional delivery and applying research-based practices in teaching, both a focus of induction coaching. Glover's study focused on the delivery of instruction and mentioned the bolstering of student performance, but no link to student achievement was provided.

Components of Student-Centered Instructional Coaching and Induction Coaching

Student-centered coaching (Denton & Hasbrouck, 2009; Hasbrouck, 2017; Sweeney, 2011, 2014, 2018; Sweeney & Harris, 2017) is founded on collaboration between coach and teacher. A coaching cycle is focused on the student and provides professional development that is responsive to student needs (Hasbrouck, 2017). The student-centered instructional coaching model is founded on a specific process that contains the elements of learning targets that are standards-aligned, goal setting based on pre-testing using learning targets, designing an action plan to meet student needs, implementation of research-based strategies to enhance student performance, reflection by coach and teacher, and ongoing formative assessment with posttesting indicating student progress (Sweeney, 2011, 2014, 2018; Sweeney & Harris, 2017). Induction coaching focuses on teacher pedagogical success and implementation of professional learning (Kwok et al., 2021). Both these types of instructional coaching provide a process for coaching support that is systematic and generic, not content-specific (Hasbrouck, 2017). Their process can be used across all content areas for coaching cycles. In the SCIC model, the results-based teaching tool documents the process of the coaching cycle

(Hanover Research, 2015). In induction coaching, results-based tools are used (New Teacher Center, 2018). There have been no studies done on the association between instructional coaching and the FAST™ data—formative assessments administered three times a year in grade K–3 in the state of this study.

Establishing Learning Targets Based on State Standards

Establishing learning targets is one of the key components of the SCIC model. Kornhaber et al. (2017) explained the history behind the development of the Common Core State Standards, and in the state where this study will occur, the state standards are modeled from the National Common Core Standards with some additions to the standards as determined by the state Department of Education. In SCIC, standards and learning targets are identified to provide a focus of pretesting and posttesting when measuring student progress. The data is used to implement and revise instructional practices, all based on what the students are to know and be able to do. With induction coaching observations are used to revise instructional practices implemented by the novice teacher. The FAST™ is based on state standards. This data used within this study examined the association between the implementation of SCIC, induction coaching, and student achievement through an examination of data during an 18-week period without a coaching cycle and an 18-week period with a coaching cycle, both during the first semester of the school year.

Goal Setting, Action Planning, and Research-Based Strategies

Within the SCIC model, instructional practices are evaluated using formative assessment (Sweeney, 2014). Pretesting data is used to determine goals, create action

plans, and determine research-based strategies to implement to guide student learning (Sweeney, 2018). Based on what the students are mastering, practices are adjusted within the coaching cycle. Instructional practices are part of the job-embedded professional development provided through SCIC and induction coaching, and the data guides the coaching team on improving instructional practices (Borman et al., 2006; Coburn & Woulfin, 2012; Crawford et al., 2017; Reddy et al., 2017). Formative assessment provides insight on the success on student learning through strategies implementation (Sweeney, 2014). Adjustments to instructional practices are based on formative assessment data.

Theory of Achievement and Formative Assessment Connection

The theoretical framework for this proposed study is Walberg's theory of achievement which described the components to advancing student achievement which included: causes and principles of learning, teachers, classroom practices, and school policies. In the area of causes of learning, motivation including self-efficacy is key. Part of developing self-efficacy is providing clear objectives and constructive feedback to students. Formative assessment is a means for making objectives clear to students and providing clear and consistent feedback on the achievement of learning outcomes. Formative assessment can be associated with the work of Benjamin Bloom in the early 1960s and advanced by Black and Wiliam (2009). The work of these researchers demonstrated formative assessment as an effective strategy for promoting student learning. Sadler (1989) described the formative assessment as one where multiple criterion are used to make judgments about the quality of student responses. Sweeney

and Harris (2017) described the model for student-centered instructional coaching, based on the process of the following core practices centered on formative assessment: (a) coaching in cycles using goal-setting for the cycles with a focus on standards-based learning targets; (b) co-planning using student work and research-based instructional practices with changes to those practices based on formative assessments; and (c) measuring how coaching relates to student and teacher learning. In this proposed study, the results-based coaching tool used in this coaching model provides a record of formative assessments and changes in instructional practices to best meet student needs during the coaching cycle. Induction tools provide a record of progress made with effective teaching practices. These tools will not be examined but might prove useful in future studies. The FAST™ Adaptive Reading (aReading) assessment data also provides formative assessment data related to student achievement in fall, winter, and spring. The tools utilized in both instructional coaching cycles could provide insight on effective means to enhance student achievement.

Quantitative Study – Repeated Measures Group Comparison

Meta-analyses (Killion, 2017; Kraft et al., 2018) have been conducted on the effect of instructional coaching on instructional practices and student achievement which is the focus of this study. In a meta-analysis conducted by Kraft et al. (2018), the intent was to estimate the effect of coaching programs on student achievement. They examined 60 studies that used causal research designs, finding only four out of 20 studies that evaluated general coaching and researched the effect on student achievement. Analysis of these four studies noted a small positive impact on student achievement, but the

researchers saw a critical need for studies to focus on specific program design features and student outcomes affected by these changes. This study focused on the specific program design features of student-centered instructional coaching and induction coaching and how instructional coaching affects student achievement.

In a meta-analysis of 36 studies, Killion (2017) noted that changes in instructional practices must be substantial to affect student achievement, so there is a need to identify instructional practices that have been shown to have a strong effect on student learning. Both meta-analyses showed a need in research to focus on specific instructional coaching design features and the association of these features to student achievement. Taking into consideration the gap, this study is focused on the features found in student-centered instructional coaching and induction coaching that aligns with Walberg's theory of achievement. This study used archival data to determine the difference in reading comprehension for third-grade students with instructional coaching and without instructional coaching using control and intervention groups.

In a meta-analysis, Killion (2017) noted a positive effect on instructional practices and a smaller effect on student achievement. Killion found limitations on the research related to coaching and student achievement and noted the need for more rigorous studies. In a meta-analysis of causal evidence on the effect of coaching on instruction and achievement, Kraft et al. (2018) found large positive effects on instruction and smaller positive effects on achievement. This was not a surprise when only four of 20 studies that evaluated general coaching programs focused on student achievement. The focus of the studies was on teacher practices. There is a need for additional studies that quantitatively

examine the difference in student achievement with and without instructional coaching, and this study quantitatively examined this difference.

In her meta-analysis, Killion concluded that studies showed a small effect on student achievement which could be attributed to the use of annual assessments as a measure of student achievement rather than formative assessments that more closely align with instructional practices. When considering the gap, this study will focus on the program design features found in student-centered coaching and induction coaching and their association with student achievement using formative assessments (FAST™), administered three times per year in reading. With the state mandate that administration of this assessment in classrooms take place three times per year in grades K–3, these assessments allow for a comparison between third-grade students without a coaching cycle and third-grade students with a coaching cycle. Using the results-based teaching tool, instructional practices are documented and in a future study could be compared with student assessments which align with the current research on instructional coaching. In this quantitative, comparative study, ratio-scale data from students who received instructional coaching (intervention group) and those who did not receive instructional coaching (control group) was analyzed with repeated measures mixed Analysis of Variance (ANOVA).

The statistical analysis used was archival data for third-grade reading achievement during the 2018–2019 school year using repeated measures mixed ANOVA. Types and sources of data included the Formative Assessment System for Teachers™ (FAST™) Adaptive Reading (aReading) assessment used to measure broad reading achievement of

students. It is a computer adaptive measurement of annual growth and is individualized for each student.

Approaching the Subject of Instructional Coaching

In most studies on instructional coaching, a qualitative study has been completed using coach, teacher, and/or administrator interviews as well as observations of the implementation of teaching strategies (Crawford et al., 2017; Haneda et al., 2017; Hopkins et al., 2017; Mangin & Dunsmore, 2015; Reddy et al., 2017). Interviews and observations provide insight into how teachers are applying professional development from their coaches within their classrooms. The strength of using a qualitative study is that interviews and observations provide insight into how teachers reflect upon and implement coaching concepts, thereby showing the effect of coaching on instructional practices. One published quantitative study focused on coaching conversations. Thomas et al. (2015) conducted a 3-year quantitative study revealing that instructional coaching conversations developed over time into a more interactive style. However, the focus of all instructional coaching is to improve student achievement, and there is a need for further studies, both quantitative and qualitative, that specifically examine student achievement. One weakness with current studies is that only a few relate to actual student achievement data which is the main reason that districts have implemented instructional coaching. When considering recent meta-analyses of instructional coaching studies, there appears to be a need for additional qualitative and quantitative studies on the difference in student achievement between periods with general instructional coaching and periods without coaching. Periods with and without instructional coaching were examined in this

quantitative study to see if there is a statistically significant difference in third-grade reading achievement based on implementation of coaching.

Justification for the Variables of this Study

The research design of this study was focused on the use of repeated measures mixed ANOVA to measure within/between interactions of student achievement in periods with/without instructional coaching. The dependent variable was third-grade reading achievement, and the independent variable was instructional coaching. Studies can use high stakes or low stakes testing to measure student achievement. A study by Boehle (2014) stated to measure the association of coaching to student achievement a method of measurement must move away from a one-time high stakes assessment such as annual achievement data. Boehle stated it is not reliable in measuring the association of coaching to student achievement because other initiatives also are part of that testing score. High stakes testing in the rural school districts of this study is the Iowa Assessments, which are annual assessments in reading mandated by Iowa Code for administration in all school districts. Using this type of assessment has too many variables that could affect student achievement besides instructional coaching. Instead, this study focused on the difference in student reading achievement with instructional coaching and without instructional coaching by using low stakes testing, the Formative Assessment System for Teachers (FAST™). FAST™ is administered to grades K–3 three times a year in school districts in Iowa. According to the Iowa Department of Education (2017), it was adopted in 2013 to support the implementation of Multi-Tiered Systems of Support. With the data being collected three times a year in reading, it lends itself to an

analysis of data with two different groups of third-grade students—those who have received instructional coaching (intervention group) and those who have not received instructional coaching (control group).

The independent variable in this study was instructional coaching with two categories—*with instructional coaching and without instructional coaching*. In this study, the coaching cycles were guided by coaching tools. Studies by Sweeney (2011, 2014, 2018) and Sweeney and Harris (2017) outlined the results-based learning tool which is used to document progress from pre-testing and post-testing, development of a plan of action, specific strategies implemented to improve student learning, and teacher/coach reflection related to student progress (Hanover Research, 2015). The focus of research was on the general instructional coaching models referred to as student-centered and induction, both with a focus on improving student achievement. All coaching models focus on providing ongoing professional development, but the main purpose of student-centered coaching is to improve student outcomes (Hasbrouck, 2017), and the main focus of induction coaching is to improve teacher practices (New Teacher Center, 2018). Student-centered coaching uses a collaborative process where both coach and teacher focus on a student need and work collaboratively towards resolving that need. Its intent is not to change a teacher's practice but rather provide support with a focus on student achievement (Hasbrouck, 2017).

This study will focus on the question: What is the effect of instructional coaching on third-grade reading achievement? According to the Department of Education Teacher Leadership and Compensation (TLC) administrator in the state of this study (L. Rasey,

personal communication, November 6, 2018), instructional coaching is practiced in every school district with the focus to improve student achievement. With student outcomes as the focus of student-centered instructional coaching and improved teaching practices the focus of induction coaching, this study will add to the body of knowledge around third-grade student reading achievement with instructional coaching and without instructional coaching.

In the state where this study took place, during the past five years, all school districts have implemented some form of instructional coaching, with student-centered instructional coaching and induction coaching being two of those models. In this quantitative study, the difference in third-grade reading achievement was analyzed with instructional coaching and without instructional coaching. The school district in this study serving as the intervention group implemented the student-centered instructional coaching model and induction coaching. Both school districts in this study administered the aReading assessment three times a year to measure student achievement with third-grade students.

Instructional coaching is a universal practice for improving professional performance. Improvement is accomplished through capacity building with individuals and/or groups of educators (Reddy et al., 2015; Reinke et al., 2014; Tanner et al., 2017). The purpose of instructional coaching is to strengthen instruction to increase student achievement. This study researched the difference in student achievement during a period with and period without instructional coaching.

This study focused on the difference in reading achievement using reading scores in third-grade classrooms in two different rural elementary schools; in one district achievement data with coaching and in the other district achievement data without coaching. The types of instructional coaching chosen to use in each of these districts were student-centered instructional coaching (SCIC) and induction coaching. Currently, there is a clearly defined coaching cycle that identifies SCIC (Boehle, 2014; Sweeney, 2011, 2018; Sweeney & Harris, 2017) and induction coaching (New Teacher Center, 2018), but the relationship between its implementation and student achievement has not been well researched. During the 2016–2017 school year, the Iowa Department of Education (2017) fully implemented the Teacher Leadership and Compensation System (TLC) in every school district across the state. One of the major goals of the TLC was "to improve student achievement by strengthening instruction" (Iowa Department of Education, 2017, p. 1), and in all districts, the method for improving student achievement was to be furthered through instructional coaching. Through the TLC program, every school district in the state provided instructional coaching to improve student achievement. Types of instructional coaching adopted were SCIC and induction coaching.

The SCIC model is based on individual needs, uses student work as a guide, and provides job-embedded professional learning, productive dialogue, and reflection on practices (Haneda et al., 2017; Wang, 2017). Coaching partnerships are a means to improve student scores and have been proven effective in literacy through weekly literacy coaching (Perkins & Cooter, 2013), through instructional coaching in a middle school

(Garcia et al., 2013), and through a combination of directive coaching on comprehension instruction as well as responsive coaching (Sailors & Price, 2015). Research supports content area coaching, but there was little research found on the difference in student reading achievement during an instructional period without instructional coaching and an instructional period with instructional coaching. To provide support for coaching, more research is needed to determine the statistical difference in student achievement for periods with instructional and without instructional coaching.

Summary and Conclusions

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement. Walberg's theory of achievement provides a lens through which to view student achievement. A repeated measures analysis of variance (ANOVA) was used to determine the effect on reading achievement during periods with instructional coaching (intervention group) and without instructional coaching (control group). The independent variable was instructional coaching, and the dependent variable was third-grade reading comprehension using the aReading assessment.

Several studies support the use of content coaching to improve student achievement (Edwards et al., 2015; Garcia et al., 2013; Perkins & Cooter, 2013; Sailors & Price, 2015). However, this project is unique because it addresses the implementation of general coaching models, which are not content-specific, and analyzed their relationships with student achievement. The student-centered instructional coaching model has a clearly defined coaching process (Boehle, 2014; Hasbrouck, 2017; Sweeney,

2018; Sweeney & Harris, 2017) but does not have quantitative studies that support improved student achievement. Induction instructional coaching is focused on first- and second-year teachers and has a clearly defined coaching process (New Teacher Center, 2018) along with a series of high-leverage tools used to guide the coaching cycles. Examining information from the New Teacher Center (Young et al., 2017), it was determined that teachers receiving 2 years of induction coaching had students that showed some gains in reading achievement, approximately 2 to 3.5 months when compared to students in a control group. More research is needed to determine gains in student achievement when instructional coaching is employed.

Walberg's theory of achievement was the theoretical basis for instructional coaching and served as a lens through which to view student reading achievement during periods with and without coaching. To measure the effect on reading achievement with instructional coaching and without instructional coaching, low-stakes assessments were analyzed. The archival data used in this study was the Formative Assessment System for Teachers (FAST™) for reading using aReading assessments (Christ et al., 2013). The assessments are given three times per year in the state to measure student achievement. This study provided an analysis of data of 181 third-grade students –the semester without coaching was compared with data from a semester with coaching.

Based on meta-analyses conducted within the past two years (Killion, 2017; Kraft et al., 2018), a need has been established for further research on the effect of instructional coaching on student achievement. According to Sweeney and Harris (2017), the student-centered instructional coaching model emphasizes qualitative rather than quantitative

information using formative data to ensure students are progressing towards achieving the standards of instruction. This study focused on quantitative information on student reading achievement using the FAST™ aReading assessment and comparing data with instructional coaching and comparing data without coaching. Student achievement is the main reason for the implementation of coaching in Iowa districts, and student achievement is measured in districts and reported to the state through Iowa Assessments and FAST™ assessments. The student-centered instructional coaching model uses student progress on standards-based learning targets to measure student achievement, and induction coaching uses high-leverage formative assessment tools to gather data of practice and inform professional learning, problem-solving, and collaborative inquiry. However, to assure instructional coaching has an association on student achievement as defined by a measure used by the state-mandated test, pre- and post-testing scores from FAST™ assessments were used as a means of data to measure student reading achievement and determine the statistical difference with and without coaching.

The key to the student-centered instructional coaching model goes beyond just a focus on improving instructional practices. It focuses on student work first, uses pre-testing as a baseline of student achievement, followed by creating an action plan for instructional practice implementation, as well as embedded time for revision of the practices based on student performance, with posttesting as a measure of the association between the coaching and student achievement (Sweeney, 2011, 2018, 2019). This study will go beyond the posttesting data related to standards-aligned learning targets found in the student-centered coaching model. The measuring of success for induction

instructional coaching must go beyond just a focus on the novice teacher's instructional practices to actual effect on student achievement. This study used the FAST™ assessments as a means of formatively assessing student reading achievement during periods with instructional coaching and periods without instructional coaching.

A connection exists between instructional coaching and Walberg's theory of achievement. Walberg's theory of achievement identified nine variables that influenced student outcomes, one being quality of instruction. A coaching cycle provides an opportunity to create action plans and implement instructional practices for student learning through goal setting, based on student work (Boehle, 2014; Sweeney, 2011, 2018; Sweeney & Harris, 2017), thereby providing a focus on the quality of instruction. Instructional coaching served as the independent variable in this study as reading achievement data from groups with coaching and without coaching were compared. The FAST™ data is used in school districts across the state to monitor student achievement quantitatively and was used as the dependent variable to measure student achievement in this study.

The significance of this study is that it may contribute to positive social change by providing information to school districts for data-based decisions when implementing instructional coaching to improve student achievement. The results of this study could support school districts in selecting a coaching approach as an effective method for improving student achievement. Using reading achievement data with third-grade students when coaching occurred and comparing data with third grade students when coaching did not occur, it was hoped that this study would contribute to the body of

knowledge in understanding the effect of instructional coaching on third-grade reading achievement with a focus on student-centered instructional coaching and induction coaching. This study also can serve as a model for districts to measure student achievement when implementing instructional coaching.

Chapter 3 will describe the research design and rationale as well as the methodology for this quantitative study. A repeated measure mixed ANOVA (within/between) was used. The groups used were third-grade students with a control group (aReading scores without instructional coaching) and an intervention group (aReading scores with instructional coaching).

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement. This quantitative study was a repeated measure group comparison study of reading achievement scores using two groups during an 18-week instructional period: a control group without instructional coaching and an intervention group with instructional coaching. The problem addressed in this study was that school districts have implemented instructional coaching to improve student reading achievement, but the effectiveness is unknown.

Instructional coaching is implemented to improve student achievement (Kurz et al., 2017), and studies support there is a gap remaining in the literature that supports instructional coaching to improve student achievement (Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). Currently, there are specific processes that describe student-centered coaching (Sweeney, 2011, 2018; Sweeney & Harris, 2017) and induction coaching (New Teacher Center, 2018) which served as the instructional coaching approaches for the intervention group in this study. According to an exploration of the student-centered coaching website and an interview with Harris (personal communication, 2017), there was a gap in published research supporting the relationship between its implementation and student achievement in reading.

This chapter will focus on the research method of this study. The components found in this chapter explain the research design and rationale including the study variables and design choice. The methodology includes a description of the population,

sampling procedures, intervention, data, and instrumentation. The data analysis plan is outlined as well as threats to validity. The chapter concludes with a summary of the research method.

Research Design and Rationale

In this section, study variables and research design will be explained. Other methods considered will be discussed along with time and resource constraints. Rationale of design choice will be given and an explanation of intervention choice.

Study Variables

The variables in this study consisted of both continuous and nominal variables. The dependent continuous variable was third-grade reading achievement as measured by the FAST™ on the Adaptive Reading (aReading) assessment. The nominal independent variable was instructional coaching. The research question was: What is the effect of instructional coaching on third-grade reading achievement?

Research Design

The purpose of this quantitative, comparative study was to examine the effect of instructional coaching on third-grade reading achievement. A repeated measures group comparison research design was used to determine the statistical difference in third-grade reading achievement as measured by aReading scores with instructional coaching and without instructional coaching. Walberg's theory of achievement was used as a lens through which to view student achievement and the instructional coaching process. A repeated measures mixed ANOVA was used to measure within/between interactions.

Other Methods Considered

A quantitative study has been chosen as there is a gap in knowledge related to the effect of instructional coaching on student reading achievement. I considered using the same group of students to measure their reading achievement growth without instructional coaching and with instructional coaching; however, through advice by the University Research Reviewer and my committee, it was determined that the use of a control group and an intervention group was a more reliable form of data. I also considered using an ANCOVA; however, there were no covariates to measure in this study. Knowing that aReading assessments are completed for all third-graders in the state where this study took place along with the implementation of instructional coaching in all districts, a quantitative study was designed.

Time and Resource Constraints

The study had no time restraints as archival data was used for the 2018–2019 school year when analyzing reading achievement during periods with instructional coaching and without instructional coaching. Data was used from two rural school districts that have administered aReading assessments three times per year during the school year. Both districts also implemented student-centered instructional coaching and induction coaching during the 2018–2019 school year and provided information as to the periods of instructional coaching implementation during the school year which allowed for a comparison design using repeated measures with the groups participating in the study. There were a total of nine reading classes included in this study—four classes in

the control group (without instructional coaching) and five classes in the intervention group (receiving instructional coaching).

Design Choice and Rationale

The statistical test used was a repeated measures one-way analysis of variance (ANOVA). The analysis of data included measuring within/between interactions using repeated measure group comparison design. The scores used to measure reading achievement were from Adaptive Reading (aReading) assessments (Christ et al., 2013). A comparison analyzed the reading assessment data during an 18-week instructional period using two groups of third-grade students—those who have received instructional coaching and those without instructional coaching. Both school districts use FAST™ assessment (aReading) to measure reading achievement progress (fall, winter, and spring). The data with a total of 80 students without coaching was compared with a total of 101 students with coaching.

The variable operationalization in this study included: (a) IV – Instructional coaching (nominal variable – yes/no); (b) DV – third-grade reading achievement (continuous variable) as measured by aReading assessment scores. In summary of the study variables, the dependent variable was student reading achievement, and the independent variable was instructional coaching—one group received instructional coaching and one group did not receive instructional coaching.

When analyzing data using repeated measures mixed ANOVA, five assumptions were required for this type of study to produce valid results (Lund Research Ltd., 2018). One assumption that was evident in this study was that the dependent variable (reading

achievement) was measured at a continuous level. The second assumption was the independent variable consisted of at least two related groups. In this study, the groups were third-grade students with instructional coaching and without instructional coaching. The third assumption was there should be no significant outliers creating a negative effect on the Repeated-Measures ANOVA (2019). There were no outliers identified in the data. In this study, the same students were in the control group and the same students were in the intervention group. The fourth assumption focused on normality, and the fifth assumption focused on sphericity. Assumptions one and two were checked as data was gathered. Assumptions three, four, and five were checked using the Statistical Package for Social Sciences (SPSS) statistics.

Choice of Intervention

The intervention chosen was instructional coaching. For this study, the approaches used for coaching were student-centered instructional coaching and induction coaching. The data focused on student reading achievement. Student-centered instructional coaching used a results-based coaching tool to document learning targets with pretesting and post-testing data. Induction coaching used a series of tools to monitor the coaching process. In the state where this study takes place, all districts have implemented some form of instructional coaching. In the two districts selected for this study, the chosen instructional coaching approaches were student-centered instructional coaching and induction coaching. Student-centered instructional coaching has a clearly defined coaching process (Boehle, 2014; Hasbrouck, 2017; Sweeney, 2018; Sweeney & Harris, 2017) and so does induction coaching (New Teacher Center, 2018), but there are

few quantitative studies that support these coaching approaches as means to improve student achievement. The concepts found in these types of coaching are included in the components found in Walberg's theory of achievement; however, few studies connect student achievement to periods with and without instructional coaching.

Methodology

In the methodology section, population and sampling for this study are given. Recruitment, participation, and data collection are described. Intervention archival data along with instrumentation and operationalization of constructs are explained. This section concludes with the data analysis plan and a review of the research question and hypotheses.

Population

This population for this study consisted of 181 third-grade students in two rural school districts using third-grade reading achievement scores from the Adaptive Reading assessment. Both districts use the FAST™ assessments to measure student reading achievement in the third grade. Both districts administer the assessments three times a year—fall, winter, and spring. The administration of the assessments assures fidelity of implementation.

Sampling and Sampling Procedures

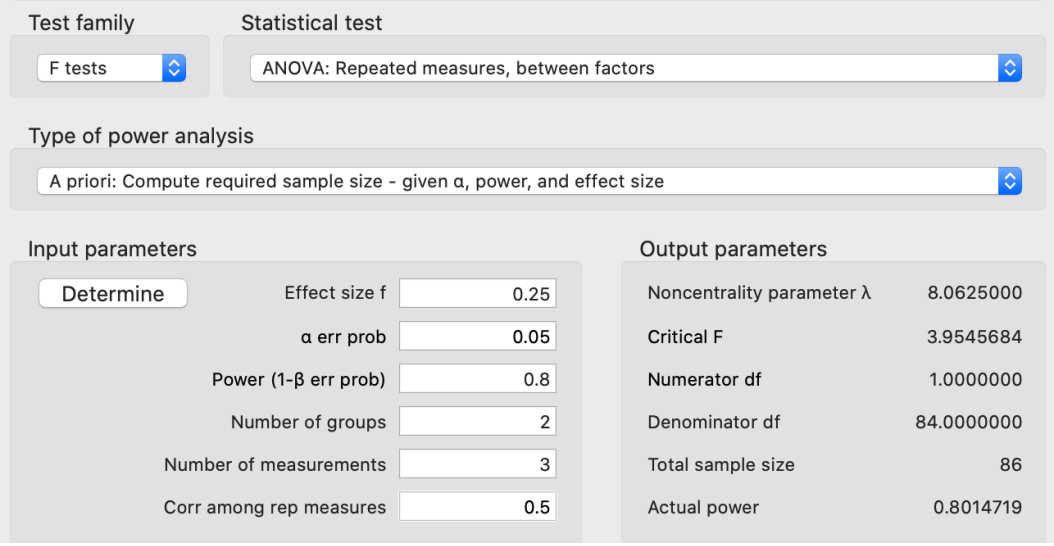
Criterion sampling includes all third-grade students receiving reading instruction within the general education classroom in two different school districts. All students taking the aReading assessment were part of this study to measure the effect of instructional coaching on reading achievement. Exclusion criteria were students who

received pullout reading instruction who were included in this study as their teachers were not part of the instructional coaching given within the general education classroom. The procedures for sampling first included FAST™ aReading assessment data from one district of third-grade students during a period without instructional coaching. The next sampling was from a different school district of third-grade students during the same period with the implementation of instructional coaching.

A G*Power analysis was conducted (Faul et al., 2007) and is summarized in the following figure (see Figure 3). The G*Power analysis showed the sample size to be 86. Figure 3 is the G*Power Analysis that determines the number of students (in this case, 86) that should be part of a statistical test - ANOVA using repeated measures between factors.

Figure 3

*G*Power Analysis*



Recruitment, Participation, and Data Collection (Primary Data)

Recruitment, participation, and data collection consisted of third-grade students in two rural school districts taught by different reading teachers. The intervention group was coached by instructional coaches receiving the same training and with the same expectations to assure fidelity of the delivery of coaching. The FAST™ assessment data for aReading was used from the 2018–2019 school year. The researcher collaborated with the Directors of Curriculum in both school districts to gain access to the data set. The Directors removed student names and assigned student numbers to those participating. The Directors provided student data according to the reading teachers with the only designation of the teachers by the form of instructional coaching they received.

After the University Research Review (URR) proposal phase was approved, the researcher completed the Institutional Review Board (IRB) application. The IRB documents were submitted to assure all ethical issues were addressed before proposal approval. Once approved and completed, a sample permission letter was sent and signatures granting permission by administrators from both districts were received. All third-grade students during the 2018–2019 school year were part of this study. There was no exit from this study or follow-up interviews as archival data was used.

Intervention

The intervention involved in this study was instructional coaching; more specifically, student-centered instructional coaching and induction coaching used district-wide. The student-centered instructional coaching model is based on individual needs using student work through formative assessments as a guide. Both SCIC and induction coaching provide job-embedded professional learning, productive dialogue, and

reflection on practices (Haneda et al., 2017; Wang, 2017). Research supports the specific factors found in an effective instructional coaching model (Knight et al., 2015), and these factors are found in student-centered coaching (Sweeney & Harris, 2017) and induction coaching (New Teacher Center, 2018). Both coaching models are general instructional models designed to be used across any content area with the intent of increased student achievement. For this study, the dependent variable was reading achievement.

Sweeney (2018) described the process found in the student-centered instructional coaching model which includes: (a) coaching in cycles using goal setting for the cycles with a focus on standards-based learning targets; (b) co-planning using student work and research-based instructional practices with changes to those practices based on formative assessments; and (c) measuring how coaching relates to student learning. Induction coaching provides support to first- and second-year teachers in the areas of cooperative learning, setting goals and providing feedback, and generating and testing hypotheses (Walberg, 2003). In this study, the statistical difference in reading achievement using the FAST™ aReading data was analyzed using reading achievement data with instructional coaching and without instructional coaching for third-grade students in two different districts.

Archival Data

Archival data was used for the 2018–2019 school year. This data was available at the curriculum offices of the school districts where this study took place. FastBridge Learning is data that is used by the state Department of Education as part of the state-wide data system for K–3 literacy. It is used at the district level to determine students in

need of Tier II and Tier III interventions. The Adaptive Reading assessment found in FAST™ is a universal screener used to measure student reading achievement throughout the school year.

Instrumentation and Operationalization of Constructs

In this study, a repeated measures one-way Analysis of Variance (ANOVA) was used to analyze the student achievement data. The Formative Assessment System for Teachers (FAST™) for reading using Adaptive Reading (aReading) assessments (Christ et al., 2013) was used for reading achievement scores and the ANOVA was used to analyze the data to answer the research questions.

Adaptive Reading (aReading) from FastBridge Learning is a computer-administered adaptive measure of broad reading including concepts of print, phonemic awareness, phonics, comprehension, and vocabulary (FastBridge Learning, 2020). According to FastBridge Learning (2016), "the assessment is based on ten years of research built upon the recommendation of the National Reading Panel (2000) and is cross walked with the National Common Core Standards" (para. 4). The assessment is individualized based on the child's skill level by using browser-based software. The research evidence shows aReading provides an estimate of broad reading achievement. According to the National Center on Intensive Intervention (2020), aReading has received the highest possible rating for validity, reliability, and diagnostic accuracy, and was also analyzed for bias with negligible differential item functioning. The aReading scores provided data related to student reading achievement and were used to determine the effect of instructional coaching on reading achievement.

According to Gansemer-Topf et al. (2017), effective assessment practices must include clear definitions along with operationalizing terminology. In this study, the variable student achievement in reading was defined by the FAST™ assessments data—aReading (FastBridge Learning, 2020). This assessment is individualized through software based on student performance and is measured three times per year through universal screening. The scores are determined using a 30 to 60 question assessment with a unified reading construct targeting concepts of print, phonological awareness, phonics, vocabulary, and comprehension. Each assessment is individualized determining if a student scores at, above, or significantly below grade level. The range of scaled scores is between 350–650 with benchmark/criterion standards specified for a grade level. Individual scores are labeled as college pathway, low risk, some risk, and high risk (FastBridge Learning, 2020).

The independent variable of instructional coaching was defined as student-centered instructional coaching and induction coaching. Both types of coaching are primarily grounded in problem-solving and provide instructional consultation (Denton & Hasbrouck, 2009). Documentation of data measuring progress on learning targets, instructional strategies implemented, teacher reflection, and coach reflection (Sweeney & Harris, 2017) are all part of instructional coaching. Two school districts with third graders were used to operationalize the independent variable—one group received instructional coaching and one group did not receive instructional coaching. In this study, as the same 18-week instructional periods were examined, the independent variable was operationalized with 1, 2, and 3 - 1 indicating students who did not receive instructional

coaching, 2 indicating students who received student-centered instructional coaching, and 3 indicating students who received induction coaching.

Data Analysis Plan: Software used for Analyses

The software used for analyses was the Statistical Package for Social Sciences (SPSS 25). SPSS 25 was used to conduct a repeated-measures mixed one-way analysis of variance (ANOVA) with testing conducted for the differences in the means of the dependent variable (reading achievement) using two levels of the independent variable. The categorical independent variable consisted of two categories—with instructional coaching and without instructional coaching. A test was completed for differences in the means of the dependent variable (reading achievement on aReading assessments) broken down by the levels of the independent variable (no coaching and coaching). The results determined if the greatest gains in the mean on reading achievement was found with coaching or without coaching, focusing on the purpose of this quantitative study—to examine the effect of instructional coaching on third-grade reading achievement. An experiement is more efficient and variablity is low when repeated measures are used in a quantitative study. This type of design also requires a smaller sample size for testing (Repeated-Measures ANOVA, 2019).

Research Question and Hypotheses

Data were analyzed and interpreted to address the following research question: Research Question 1: What is the effect of instructional coaching on third-grade reading achievement?

$H_0$1: There is no statistically significant difference in reading achievement between third-grade students with and without instructional coaching.

H_a1: There is a statistically significant difference in reading achievement between third-grade students with and without instructional coaching.

Threats to Validity

External Validity: Generalizing the Results, Treatment Interferences

Gundry and Deterding (2019) described external validity as a concept that can be influenced in a variety of areas including generalizing the results. This refers to correlations holding across other people, settings, treatments, and measures. In this study, generalizing the results is not an influencer since all third-grade students in the testing sites were used—people, setting, treatments, and measures were correlations that held. However, there could have been multiple treatment interferences, especially when considering students who also received Tier II and Tier III interventions in reading. This threat was lessened as students who received the tier interventions received them across the period of testing data. This study reported trends and may not be transferable to other populations; thereby limiting its generalizability.

Internal Validity: Maturation, Instrumentation, Selection

Gundry and Deterding (2019) described threats to internal validity in quantitative studies. One threat to internal validity found in this study could have included maturation—as students change throughout the school year and their experiences during the year. Their performance could be influenced by outside experiences and not by noncoaching versus coaching.

Another internal validity threat could have been instrumentation—gathering data using the same reading achievement assessment from before and after implementation of coaching could be influenced by a repetition of the same measure. This threat was controlled by the fact that the aReading assessment is individualized based upon the student's performance and is consistently administered in the same way and during the same periods for each of the school districts involved in this study. Instrumentation threats were reduced or eliminated by making every effort to maintain consistency at each observation point. This included the use of the same student achievement assessment (aReading), the administrators (classroom teachers), and the method of administration (computerized).

Another internal threat considered was selection. According to the selection, this threat can stem from the differential selection of teachers who apply the innovation to the intervention group. This was controlled by reporting each reading teacher's scores separately in the control group. Selection bias was also controlled through the fact that all teachers within a building received coaching from an instructional coach who received the same training and followed the same procedure for the coaching framework.

Construct Validity: Testing

Construct validity is how well a test measures what it states it will measure. In this study, the aReading (Adaptive Reading) assessment was used to measure student achievement in reading. The aReading assessment from FastBridge Learning (2020) is a curriculum-based measurement using a computer adaptive test for measuring concepts of print, phonemic awareness, phonics, comprehension, and vocabulary. According to its

website, this assessment was built on recommendations by the National Reading Panel and is "cross-walked with the National Core Standards (2010)" (FastBridge Learning, 2020, para. 4). It provides an estimate of broad reading achievement. This assessment "received the highest possible rating for validity, reliability, and diagnostic accuracy from the National Center for Response to Intervention" (FastBridge Learning, 2020, para. 5). The FAST™ reports evaluate reading performance using benchmark/criterion standards for grade levels.

Reliability, Validity, and Bias

Reliability for grade 3 on the Adaptive Reading assessment was found to have a coefficient of .91 and a confidence interval of 0.90, 0.92. For grade 3, reliability FAST™ was measured using Gates-MacGinitie Reading Tests – 4th Edition. For grade 3 the coefficient was 0.84 with a confidence level of 0.79, 0.88 (National Center on Intensive Intervention, 2020). Adaptive Reading was assessed for bias using the "linguistic regression procedure for detection of uniform and non-uniform differential item functioning" (National Center on Intensive Intervention, 2020). No negligible differential item functioning for all items examined was found.

Research bias was controlled using an intervention group and a control group as students selected were from similar rural districts; therefore, exposure to events or experiences were also similar. Maturation was controlled by using the same age group across the same periods. The regression was considered as all third-grade students in the intervention and control groups were included in the study. Extreme scores were not factored out of the study.

When considering bias in a research study, participants within the study may lead to selection bias, but this was not present in this study. Within this study, the population were all third-grade students across two rural school districts. This controlled for sampling bias as all third-grade students within the two school districts were part of the study. The entire population of third-grade students was used.

Within the study, procedural bias and measurement bias could have been present. This was controlled as all students were given the aReading assessment in the same way – computer-generated and during the same periods during the school year. Measurement bias was controlled by the independent administration of the assessment for all third-grade students. There was no presence of observer bias or expectancy bias as archival data were used in this study.

Within the interpretation of data, the research design controlled for bias. Using repeated measures mixed analysis (ANOVA), measuring was a repeated measures group comparison design within/between the interactions of coaching and non-coaching periods.

Ethical Procedures

To maintain research ethics, no action took place until the proposal was approved including an analysis of data or communication with school districts. Since this study included archival data, no participants were contacted. In the future, the IRB application and documents will be found in a separate folder including letters to and from institutions requesting participation and securing participation in the study, institutional permissions, and actual documents in the Institutional Review Board application. Data will be shared

with the districts using students only identified numerically for this study. Data gathered will be part of this dissertation and shared with the district administration and building administration. As archival data were used, incentives were not needed.

Resnik (2020) described the ethical norms in research and were the norms that were maintained throughout this research study. As a researcher, I made every effort to maintain ethical norms. The aims of research were promoted as knowledge was described, truth was adhered to, and avoidance of error maintained. The values of collaborative work were promoted through contact with district administrators as data were gathered and as I collaborated with my committee and my University Review Researcher. Being accountable to the public for what is published through this study has been foremost. Moral and social values were promoted through adherence to the design and purpose of this study as well as guidelines and regulations related to confidentiality. Ethical norms were maintained as this research study was conducted and published.

Summary

In summary, the research design for this study was repeated measures analysis of variance (ANOVA) measuring the within/between interactions. The scores on aReading assessments (Christ et al., 2013) were used to measure reading achievement. Instructional coaching was the nominal independent variable used in this study, and the continuous dependent variable was third-grade reading achievement. This study addressed the gap in knowledge related to the difference in reading comprehension for third-grade students receiving instructional coaching (intervention group) and those not receiving instructional coaching (control group).

Chapter 4: Results

Introduction

Instructional coaching has been implemented in school districts across our nation with the main goal of improving student achievement. One of the ways districts have sought to accomplish the goal of improved student achievement has been the implementation of instructional coaching to provide meaningful job-embedded professional learning for teachers to improve instruction and to assure effective instructional practices are implemented in classrooms (Holmes, V.R. & Houston Independent School District, 2020). Walsh et al. (2020) explored in their survey research, the effect of instructional coaching on teacher efficacy which is a belief in an ability to execute a course of action to produce desired results. Through instructional coaching and its guiding relationship, an opportunity is provided for the application of professional learning into the daily work of teachers (Kraft et al., 2018). According to DeJong and Campoli (2018), instructional coaches can increase a teacher's ability to act as change agents to increase student learning. When student learning is increased, enhancement of teacher efficacy follows (Shields & Murray, 2017). A teacher may report that instructional coaching has assisted in changing their instructional practices (Rasey, 2019). However, to assure that instructional coaching is a meaningful way of improving student achievement, additional studies are needed to examine the difference in student achievement between students receiving instructional coaching and those who have not received instructional coaching.

In the state where this study took place, all 332 school districts implemented an instructional coaching model as a part of establishing teacher leadership roles and improving student achievement. The website of the state department of education stated that the purpose of establishing teacher leadership roles such as instructional coaching was to increase student achievement (Iowa Department of Education, 2017); however, few quantitative studies support an increase in student achievement through instructional coaching. Therefore, the purpose of this quantitative study was to analyze formative assessment data for third graders from two rural school districts during the first 18 weeks of the 2018-2019 school year – one serving as a control group where no instructional coaching took place and another serving as the intervention group where instructional coaching took place during the stated period.

Purpose

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement during an 18-week instructional period with instructional coaching as the independent variable and third-grade reading achievement as the dependent variable. An analysis of variance (ANOVA) using aReading scores was used to investigate the effects of instructional coaching on reading comprehension during an 18-week instructional period with instructional coaching (intervention groups) and without instructional coaching (control group). The design of this study was a repeated measures group comparison within/between the interactions.

Research Question and Hypotheses

The following research question was addressed within this research study:

Research Question 1: What is the effect of instructional coaching on third-grade reading achievement?

The hypotheses related to this research study included the following hypothesis and null hypothesis:

H_a1: There is a statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.

H_01: There is no statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.

Preview Organization for Chapter 4

Chapter 4 begins with a brief introduction to this quantitative research study along with a description of the purpose, research question, and hypotheses. Following this preview, a description of the data collection along with the treatment and intervention with fidelity are given. The statistical analysis findings are included in tables and figures along with a data analysis related to the hypotheses. Chapter 4 concludes with a summary related to the research question and transitions into Chapter 5.

Data Collection

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement during an 18-week instructional period with instructional coaching as the independent variable and third-grade reading achievement as the dependent variable. A repeated measures group comparison research design was used to determine the statistical difference in third-grade reading achievement as

measured by aReading scores with instructional coaching and without instructional coaching. The time frame for data collection was the 2018-2019 school year. This school year was selected because during the following school years – 2019-2020 and 2020-2021, the SARS-CoV-2 (COVID-19) pandemic occurred; the testing data were not required by the state as virtual instruction took place during the last months of the 2019-2020 school year (Kuhfeld et al., 2020) along with high absenteeism. There were no discrepancies in data collection from the plan presented in Chapter 3 as archival data from the 2018-2019 school year were used.

Two rural school districts of comparable sizes were chosen for this research study. Both districts administered the Formative Assessment System for Teachers (FAST™) using the Adaptive Reading (aReading) assessment 3 times during the 2018-2019 school year – fall, winter, and spring. This research study focused on the fall to winter scores during the 2018-2019 school year. In the control group consisting of 80 third grade students, instructional coaching did not take place during the first 18 weeks of school. The intervention group consisted of 101 students where instructional coaching took place during the first 18 weeks of school. Archival data were used, and all students who were administered the FAST™ aReading assessments in the fall and winter were included in the sample size. In the state where this research study took place, third-grade classrooms administered the FAST™ assessment to measure student achievement three times per year.

Treatment and/or Intervention Fidelity

The treatment of instructional coaching was administered as planned to the control group during the first 18 weeks of the school year. There were no challenges that prevented implementation of coaching as evidenced by the data received from the curriculum director in the district serving as the intervention group. The data were provided in a spreadsheet organized under student-centered instructional coaching and induction coaching, indicating coaching took place according to their district procedures.

For the control group ($N = 80$), all third graders were administered the aReading assessment in the fall and winter with no instructional coaching occurring during this timeframe. For the intervention group, instructional coaching was given in all 5 classrooms during the fall to winter period ($N = 101$). In addition to the aReading scores, data related to the type of instructional coaching were also received. The intervention group consisted of data from 5 third-grade classrooms – 3 classrooms ($N = 60$) received instructional coaching using the student-centered coaching model while 2 classrooms ($N = 41$) received instructional coaching using the teacher-centered model used by induction coaches working with teachers in their first and second years of teaching. One change from the proposed study explained in Chapters 1-3 was that the data received for the control group were not disaggregated by the teacher. That changed slightly the reporting of the data but determining a statistical difference as well as achievement comparing the groups were still possible.

Results

The research question was: What is the effect of instructional coaching on third-grade reading achievement? In the dataset used ($N = 181$), the desired outcome was increased reading achievement on the aReading assessments given in both fall (pretest) and winter (posttest) with a statistically significant difference in the intervention group when compared to the control group.

Table 1 compares the data from the control group and the intervention groups displaying the means of the pretest and the posttest for the control group and the two instructional coaching groups - student-centered and induction. Displayed in Table 1 is a repeated-measures ANOVA comparing the mean of the control group with the means of the intervention groups on pre- and post-testing. In the descriptive statistics chart, the following is evident:

- Difference in the mean of the Control Group from Fall to Winter: +11.91
- Difference in the mean of the Student-Centered Intervention Group from Fall to Winter: +9.1
- Difference in the mean of the Induction Intervention Group from Fall to Winter: +7.61

Table 1

Comparison Data of the Means for Each Intervention Group: Fall and Winter

Descriptive Statistics

	Instruction	Mean	Std. Deviation	N
Fall 2018	No Coaching	488.45	23.070	80
	Student Centered Instructional Coaching	501.38	16.882	60
	Induction Instructional Coaching	498.85	25.427	41
	Total	495.09	22.510	181
Winter 2019	No Coaching	500.36	17.620	80
	Student Centered Instructional Coaching	510.48	13.220	60
	Induction Instructional Coaching	506.46	27.304	41
	Total	505.10	19.475	181

This study hypothesized that there would be a statistical difference between those receiving instructional coaching and those not receiving instructional coaching. When determining the validity of scores, the question was: What are the chances that the differences that we observed occurred through random error alone? To determine the statistical difference from pre- to posttest for the entire group of students ($N = 181$), a paired-samples t-test was conducted. In Table 2, the paired samples correlations showed a high correlation between the pretest and the posttest across all samples. In the paired samples t-test, $p<.001$ was determined. In Table 3, in the significance column, the results of the paired samples t-test are given showing a significant difference from pretest to posttest reading achievement scores for the entire group of students. Both tables support

this fact, but this does not give us information on whether the intervention was more effective than those not receiving the intervention.

Table 2

Paired Samples Correlation

		N	Correlation	Sig.
Pair 1	Fall aReading & Winter aReading	181	.900	.000

Table 3

Paired Differences

		Paired Differences							
					95% Confidence Interval of Difference				
		Mean	Std. Deviation	St. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Fall aReading – Winter aReading	-10.193	9.804	.729	-11.631	-8.755	-13.988	180	.000

In Table 4, Levene's Test of Equality of Error Variance measures how far away from the mean each factor is within each group. Are the variances equal in each group? The Levene's test was conducted to see if the variances of each group are equal in the population. This test conducts an ANOVA on the absolute value of the difference of each score - how far it is from its respective mean. The Levene's test checks the equality of

variances. A non-significant *p*-value of Levene's test is shown in this table. The result is that the variances are indeed equal and there is no difference in variances of both groups. Looking at the fall mean ($p = .198$) and the winter mean ($p = .178$), we fail to reject the null hypothesis, so we assume there is homogeneity of variance.

Table 3

Levene's Test of Equality of Error Variances[a]

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
Fall 2018	Based on Mean	1.634	2	178	.198
	Based on Median	1.188	2	178	.307
	Based on Median and with adjusted df	1.188	2	156.028	.307
	Based on trimmed mean	1.322	2	178	.269
Winter 2019	Based on Mean	1.745	2	178	.178
	Based on Median	1.477	2	178	.231
	Based on Median and with adjusted df	1.477	2	106.899	.233
	Based on trimmed mean	1.452	2	178	.237

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

a. Design: Intercept + Treatments
Within Subjects Design: Time

In Table 5, when conducting a repeated-measures Analysis of Variance (ANOVA) and examining the between-subjects effects, there is statistical significance for time ($p < .001$ - between pretests and posttests) but not for treatment ($p = .379$ - between coaching and no coaching).

Table 5

Test of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: Winter 2019

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	56117.393[a]	3	18705.798	272.486	<.001	.822
Intercept	4549.826	1	4549.826	66.277	<.001	.272
Pretest	52506.849	1	52506.849	764.863	<.001	.812
Treatments	133.822	2	66.911	.975	.379	.011
Error	12150.817	177	68.649			
Total	46245975.000	181				
Corrected Total	68268.210	180				

a. R Squared = .822 (Adjusted R Squared = .819)

In Table 6 (Pairwise Comparisons) when analyzing the means, there was a statistical significance between the no coaching group and student-centered instructional coaching ($p < .003$), and no statistical significance between the no coaching group and induction instruction coaching *(*$p = .097$). Using the means, there is no statistical significance between the two types of coaching ($p = 1.00$).

Table 6

Pairwise Comparisons

Measure: MEASURE_1

(I) Instruction	(J) Instruction	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
No Coaching	Student Centered Instructional Coaching	-11.527*	3.403	.003	-19.753	-3.302
	Induction Instructional Coaching	-8.252	3.828	.097	-17.503	.998
Student Centered Instructional Coaching	No Coaching	11.527*	3.403	.003	3.302	19.753
	Induction Instructional Coaching	3.275	4.038	1.000	-6.484	13.034
Induction Instructional Coaching	No Coaching	8.252	3.828	.097	-.998	17.503
	Student Centered Instructional Coaching	-3.275	4.038	1.000	-13.034	6.484

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

In Table 7, the estimated marginal means are reported. The marginal mean is the mean response for each category (control, student-centered instructional coaching, and induction instructional coaching) of a factor (pretest and posttest), adjusted for any other variables in the model. In this study, no other variables are present. The interpretation of the estimated marginal means of instructional coaching is used as the mean of each group at the mean of the covariate on fall testing. Estimated marginal means is used because the

control group has a mean from the fall assessment that is lower than the mean of the reading achievement of both instructional coaching groups, therefore, the control group was starting at lower performance than the pretest of the intervention groups. If this study only used the observed means for each treatment group, this analysis would not account for the fact that the third-grade students who did not receive the intervention performed significantly lower on the fall testing. Marginal means provides the mean reading achievement score for each treatment group. In essence, it sets the mean at a constant value before calculating the mean for each treatment group. This provides a fairer comparison between the treatment groups.

Table 7

Estimated Marginal Means

Instruction

Dependent Variable: Winter 2019

Instruction	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
No Coaching	505.593[a]	.945	503.727	507.459
Student Centered Instructional Coaching	505.532[a]	1.085	503.392	507.672
Induction Instructional Coaching	503.504[a]	1.298	500.941	506.066

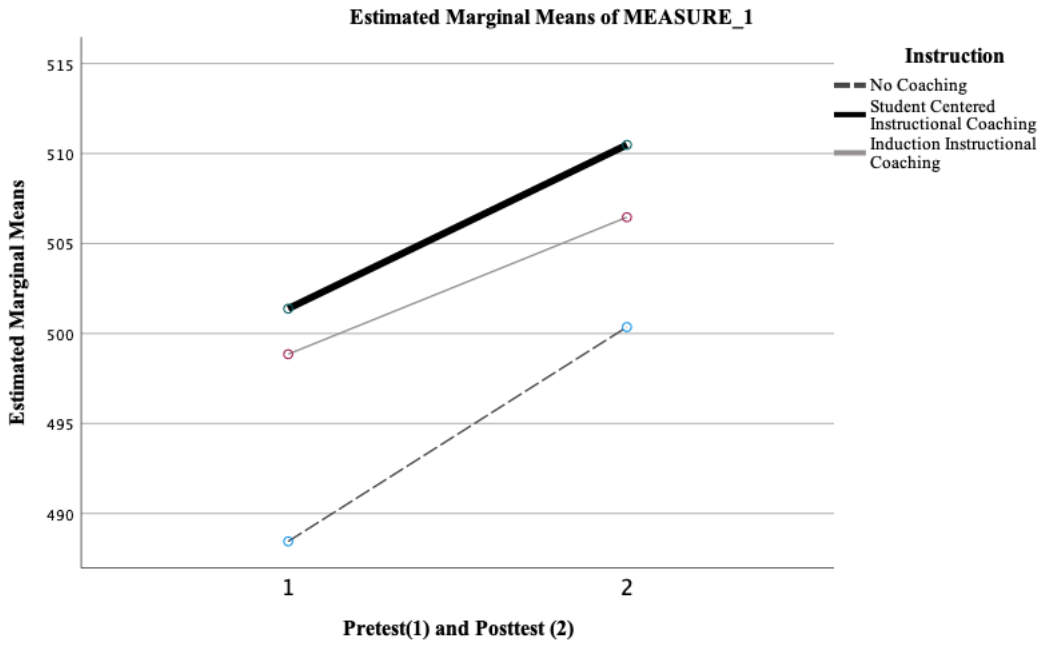
a. Covariates appearing in the model are evaluated at the following values: Fall 2018 = 495.09.

In Figure 4, the intervention groups included: student-centered instructional coaching and induction coaching (which is a teacher-centered instructional coaching type), showing that student-centered instructional coaching had a greater effect than

induction instructional coaching; however, the control group with no instructional coaching made the greatest gain in reading achievement as evidenced by the angle of the line comparing pretest to posttest means.

Figure 4

Means of Difference Between Posttest and Pretest for Control and Intervention Groups



Statistical assumptions based on SPSS provided an answer to the research question: What is the effect of instructional coaching on third-grade achievement? The hypothesis was: There is a statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching. When examining the estimated marginal means in this research study, there

was no statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.

Summary

The research question was not answered with statistical significance: What is the effect of instructional coaching on third-grade reading achievement? The null-hypothesis was not rejected: There was no statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching. This stands as one research study. To accurately answer the research question, further studies should be conducted through observation of the specific characteristics of the instructional coaching employed and how it relates specifically to the reading achievement questions used to measure growth. Other avenues for future study will be discussed in the next chapter.

In Chapter 5, more detail will be described: the way the findings disconfirm and extend knowledge in the discipline by comparing them with what has been found in the peer-reviewed literature described in chapter 2. Analysis and interpretation of the findings in the context of the theoretical and/or conceptual framework will also be described. Limitations, as well as implications of this study, will be addressed and suggested recommendations for further research that could build upon this study will be provided.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to examine the effect of instructional coaching on third-grade reading achievement. Instructional coaching served as the independent variable and reading achievement served as the dependent variable. This study focused on the following research question: What is the effect of instructional coaching on third-grade reading achievement? The key findings from this research study include:

1. In this study, there was no statistically significant difference in reading achievement between third-grade students with instructional coaching and without instructional coaching.
2. In the intervention group and the use of means, those receiving student-centered instructional coaching averaged greater gains than those receiving induction coaching.

Interpretation of the Findings

In the peer-reviewed literature described in chapter 2, studies confirmed that the purpose of implementing instructional coaching is to improve student achievement (Kurz et al., 2017; Reinke et al., 2014). However, studies noted a gap in the literature that supported instructional coaching to improve student achievement (Coe et al., 2014; Killion, 2017; Kraft et al., 2018; Kurz et al., 2017). Instructional coaching has emerged from trends in research on professional development focused on improving instructional practices (Freeman et al., 2017; Reddy et al., 2017). Those improved instructional

practices can be observed through qualitative studies, but there continues to be a need for quantitative studies to verify the quantifiable effect of instructional coaching on reading achievement. The improvement of instructional practices leading towards student achievement is the foundation of both student-centered instructional coaching and induction coaching with little quantitative data that supports the effect of instructional coaching on third-grade achievement. It is agreed by several research studies that quality instructional coaching develops collaboration, embeds professional development related to changes in instructional practices, and offers differentiated roles for teachers (Borman et al., 2006; Coburn & Woulfin, 2012; Crawford et al., 2017). Coultas and Salas (2015) reported that there are many approaches to coaching; however, little was known about the effectiveness of the various coaching approaches on student achievement. Aware of the gap in research, this study was one step towards analyzing the effect of coaching on student achievement.

Theoretical Framework: Future Studies

An examination of the study was through the lens of Walberg's theory of achievement. Walberg described environmental and student characteristics that have been shown to improve student achievement including the quality of instruction and the quantity of instruction (Walberg, 1981). The quality and quantity of instruction provided by collaboration developed between the teacher and instructional coach include clarity; matching tasks to student characteristics; use of cues, reinforcement, feedback, and correctives; clarity of instruction; task difficulty and pacing; and learning guidance – all components of instructional coaching (Knight, 2018; Sweeney, 2019). In a future study to

accurately determine if and how instructional coaching focuses on the quality and quantity of instruction, documentation should be gathered as to the quantity of time spent in coaching along with how quality of instruction is determined in the coaching cycles. An examination of the results-based tools for student-centered instructional coaching and tools used in induction coaching could provide additional insight on the quality of instruction.

Walberg et al. (1986) described nine factors outlined by the theory of educational productivity that optimize student achievement based on 3,000 studies of student learning:

> (a) ability or prior achievement, (b) age, (c) motivation or self-concept as indicated by personality tests or willingness to persevere on learning tasks, (d) quantity of instruction, (e) quality of instructional experience; and educationally stimulating psychological aspects of the (f) home environment, (g) the classroom or school environment, (h) the peer group environment, and (i) the mass media. (p. 133)

The report by Walberg et al. (1986) emphasized that no factor could serve as a solution to student achievement, but there is value in improving all productive factors, if possible, by human time and effort. With the employment of instructional coaching, human time and effort are expanded as teachers and coaches focus on quantity and quality of instruction by enhancing the classroom and school environment. Coaching also develops a partnership of peer collaboration that adds value to the peer group environment of a school. The components of instructional coaching that coincide with the

factors outlined by Walberg et al. (1986) should lead to higher student achievement. In this study, this was not the case. There was a statistically significant difference between pretesting and post-testing by all 181 participants in the study, however, the control group without coaching averaged greater gains than the intervention group when comparing the pre- and posttest means on aReading assessments.

Walberg's theory of achievement (also called the theory of educational productivity) described environmental characteristics and student characteristics that studies have shown to improve student achievement. Walberg (1981) described environmental characteristics influencing achievement – the quality of instruction, the quantity of instruction, home environment, and mass media. Walberg also described student characteristics—ability, motivation, class social environment, and peers. When examining instructional coaching, the focus was on components described by Walberg as the quality of instruction. The quality of instruction includes clarity; matching tasks to student characteristics; use of cues, reinforcement, feedback, and correctives; clarity of instruction; task difficulty and pacing; and learning guidance. Instructional coaching utilized the characteristics described by Walberg as the quality of instruction, and this study was an attempt to see how employing these characteristics through instructional coaching could impact student achievement. In future studies, a specific examination of Walberg's components as they relate to instructional coaching may provide insight on how instructional coaching effects student achievement.

Instructional Coaching: Future Studies

In Chapter 2, Borman et al. (2006) stated instructional coaching can be found along differing continua and found research on instructional coaching as being descriptive, using case studies, incorporating observations, and applying interview information with the treatment varying across settings, but aligning coaching to improved student outcomes was complex. Today's education initiatives emphasize the need for instructional improvement through developing an educator's implementation of evidence-based practices (Kurz et al., 2017). Evidence-based practices are employed to improve student learning, behavior, and/or attitude (Knight et al., 2015; Kurz et al., 2017; Woulfin & Rigby, 2017)). Learning opportunities are most effective when job-embedded and learner-centered (Mangin & Dunsmore, 2015; Spelman et al., 2016; Teemant, 2014). Coaches are active guides with teachers and serve as collaborative partners in the application of professional learning (Desimone & Pak, 2016; Reinke et al., 2014; Tanner et al., 2017). An effective coaching program is founded on collaboration between coach and teacher. This study was an attempt to see how instructional coaching quantitatively affected student achievement.

Instructional coaching is guided by a relationship between a teacher and a coach who learn together by improving instruction and potentially resulting in student achievement (Knight, 2006). Evidence-based practices are employed to improve student learning, behavior, and/or attitude (Knight et al., 2015; Kurz et al., 2017; Woulfin & Rigby, 2017). According to Walberg (1981), cognitive, behavioral, and attitudinal outcomes influence students and their environments, which influence both motivation,

quality of instruction, and classroom climate. Courses that achieve high standards "align instructional content and methods to clear, well-specified, and measurable outcome standards" (Walberg, 2010, p. 74). This type of alignment is provided within an instructional coaching cycle. In future quantitative studies, an examination of how the coaching cycles align with clear, well-specified, and measurable standards documented by a coaching cycle and then measured against the quantitative data gathered from aReading scores could be examined.

Study Results

The overriding goal of instructional coaching is to improve student achievement, and this research study was designed to determine if third-grade reading achievement improved with instructional coaching. This study began with data gathered from a control group in a rural school district where no instructional coaching took place during the first 18 weeks of the school year. For the intervention group, pretest and posttest data were gathered during the same 18 weeks in another rural school district where instructional coaching took place. Pretest and posttest data were gathered on both groups using aReading scores. The generated data showed no statistical difference between those receiving instructional coaching and those not receiving instructional coaching.

The intervention data were disaggregated by those classrooms receiving student-centered instructional coaching (SCIC) and those classrooms receiving teacher-centered instructional coaching (induction coaching) along with its effect on reading achievement in third-grade students. Those receiving student-centered instructional coaching had a greater mean on reading achievement than those receiving induction coaching, however,

the control group with no instructional coaching showed greater gains between the mean of their pretest and posttest. When examining the means of each group, the following data provided additional information upon the effect of instructional coaching:

- Mean of the Control Group from Fall to Winter: +11.91 (gain)
- Mean of the Student-Centered Intervention Group from Fall to Winter: +9.1 (gain)
- Mean of the Induction Intervention Group from Fall to Winter: +7.61 (gain)

In most studies on instructional coaching, a qualitative study has been completed using coach, teacher, and/or administrator interviews as well as observations of the implementation of teaching strategies (Crawford et al., 2017; Haneda et al., 2017; Hopkins et al., 2017; Mangin & Dunsmore, 2015; Reddy et al., 2017). It was noted in Chapter 2 that interviews and observations can provide insight into how teachers are applying professional development from their coaches within their classrooms. The strength of using a qualitative study is that interviews and observations provide insight into how teachers reflect upon and implement coaching concepts, thereby showing the effect of coaching on instructional practices. However, the focus of all instructional coaching is to improve student achievement, and there is a need for further studies, both quantitative and qualitative, that specifically examine student achievement.

According to the Statewide End-of-Year Report Summary 2018-2019 (Rasey, 2019) conducted in the state where this research study took place, the purpose of their Teacher Leadership and Compensation (TLC) program, was to improve student learning which required improving instruction students receive every school day. The report

stated, “There is no better way to do this than to empower teacher leaders to lead the way” (p. 4), and one means of leading the way is to elevate teacher leaders in a district to the position of instructional coach. Instructional coaching has been implemented in all school districts in the state to achieve the following goals that coincide with improvement of student learning: promoting a “collaborative culture where teachers share instructional practices” (p.5) and “promoting continuous improvement by leading teams in data-informed decision making” (p.5). From the report, 87% of the school districts fully or mostly met their collaboration goals which meant that they found the collaboration time was a value to teacher growth and learning with one of the components of collaboration listed as coaching cycles. According to the report, teacher leaders which included instructional coaches led to growth in “developing and supporting opportunities for teachers in school and school district statewide to learn from each other” (p.8). The question remained: How did instructional coaching quantitatively affect student achievement?

In the area of student achievement, the report stated that the goal was to improve student achievement by strengthening instruction with 58% of the school districts meeting this goal – 13% fully meeting their goal and 45% mostly meeting their goal. The concluding statement about student achievement in the Statewide End-of-Year Report Summary 2020-2021 (Rasey, 2021) stated: “an analysis of statewide, common data sources and TLC implementation data would be needed to make causal inferences between TLC implementation and student achievement” (p.23). This research study was one attempt to make inferences between instructional coaching (an important part of the

TLC implementation) and student achievement. The results for this test when comparing a control group to an intervention group showed there was no statistical difference between those receiving instruction coaching and those not receiving instructional coaching.

Limitations of the Study

In Chapter 1, a potential limitation mentioned in this study was the issue of mobility rate in a third-grade classroom. The concern was that a quantitative study requires a large sample size, and for this study, it was estimated that data of approximately 170 students in the classes would be used. For the actual study, data from 181 students were analyzed. Careful attention was given to using the same students for both the pretest and the posttest. Before receiving the data from each district, the names were removed by the curriculum directors with student numbers assigned for each student.

Another challenge faced was there were different reading teachers - four classes in the control group and five classes in the intervention group. The same coach did not provide instructional coaching for the five classes used in the intervention group so there may have been some difference in consistency in the delivery of the coaching cycle, however, the coaches received the same type of training for the implementation of instructional coaching.

Since two districts were used - one as the control and one as the intervention groups, the difference in pretesting scores were dissimilar. The mean of the control group on aReading scores on the pretest was 488.45 whereas aReading scores on the pretest for

those who were to receive instructional coaching were 501.38 (student-centered instructional coaching) and 498.85 (induction coaching).

Biases That Could Influence Study Outcomes

The types of bias considered in this study were flawed study design, control biases, selection bias, outcome misclassification, and confounding (Pannucci & Wilkins, 2010). One type of bias considered was a flawed study design. To control biases in this study, standardized data collection took place through objective methods. Selection bias was controlled as all third-grade students in the population of the study were used in the research. Outcome misclassification was avoided using validated measures of student achievement. In a study, it is not possible to control for all confounding variables. One confounding variable avoided was through a strong study design. The study design was a comparison-group study using randomly assigned students in the control group and randomly assigned students in the intervention group from two rural school districts with similar populations. The students in this study were all third-graders. The study measured pre- and posttest reading achievement scores of both groups over an 18-week period using the difference in achievement between the two groups to determine the effect of instructional coaching. Using two different groups provided an opportunity to measure the intervention as opposed to other factors resulting in the observed outcome. The G* Power analysis showed an adequate sample size as 86, and there were 181 students used in this study, so the sample size was considered adequate. Assuring a strong study design helped to avoid some confounding. Evidence of a strong study design was in the use of ratio-scale data from students who received instructional coaching (intervention group)

and those who did not receive instructional coaching (control group) with data analyzed using a repeated-measures mixed Analysis of Variance (ANOVA). The data used were archival data from the Formative Assessment System for Teachers (FAST™) on the Adaptive Reading (aReading) assessment during an 18-week instructional time.

A key confounding variable that could have influenced the results could be the years a teacher has been in the classroom. In the control group, all four teachers had years of experience beyond 1 and 2 years. Those teachers in the student-centered instructional coaching group also had experience beyond 1 and 2 years. Those teachers in the induction coaching group had only been in the classroom 1 or 2 years. This confounding variable could impact the reading achievement because of limited experience in teaching. This variable might be one that should be more closely examined in other students relating to the effect of instructional coaching on reading achievement.

Significance

The potential contributions of this study provide a starting point for future quantitative studies focused on the effect of instructional coaching. There continues to be a need to provide research studies that examine periods with and without instructional coaching and the effect on student achievement. In a future study identifying and analyzing the instructional coaching model used would be of value as there are a variety of instructional coaching models that are implemented in school districts. Research using student-centered coaching and induction coaching as the independent variable and student achievement as the dependent variable provided a measure of the effect on reading achievement with instructional coaching. In this study implementation of

instructional coaching as an effective means towards improving student reading achievement when compared to a control group was not determined.

Recommendations

This research study focused on two rural school districts of similar size during the first semester of the 2018-2019 school year (prepandemic) using archival reading achievement data for third graders. This study did not show a significant difference between third-grade pretesting and posttesting on the aReading scores based on fall to winter and using instructional coaching and no instructional coaching. From this study, there are recommendations for further research.

One recommendation to build upon this study would be to examine the data for both schools used in this study from additional school years (2017-2018, 2019-2020) comparing three years of third-grade achievement between control groups and interventions groups, thereby using third-grade reading achievement for all three years. This would develop a trendline regarding third-grade reading achievement with and without instructional coaching. Continuing to use aReading scores is supported by Killion (2017) in a meta-analysis, finding a large positive effect of coaching on instruction and a smaller positive effect on achievement. Killion concluded that annual assessments do not closely align with instructional practices as much as formative assessments. In this study aReading is considered a formative assessment and offers a strong possibility to apply this data to future studies.

Another recommendation would be to use students in the same school districts. This would provide a more closely aligned aReading pretest score from which to begin

the study. This would provide groups of students performing at a similar level on the pretest of the aReading assessment.

A third recommendation would be for school districts to closely examine how they implement instructional coaching. Districts should examine the expectations of coaches – are they required to coach all teachers for the same amount of time? Moody (2019) stated that instructional coaching may be implemented in schools without thoughtful strategic implementation planning. A district might level teachers including years of experience as well as those requiring more assistance to become effective instructors and use this data to determine length of coaching time. A district might consider what Moody suggests - that coaching needs to align with school and district improvement strategies and can be influenced by recruitment of high-quality teachers, the type of professional development presented in a district, and clear expectations. He suggested a tiered system of coaching based on those needing little guidance to those needing a high level of assistance - facilitative assistance, flexible assistance, and intensive assistance. In this study, no level was determined for the teacher, however, one could assume that those receiving induction coaching were in their first two years of teaching which could mean the teaching experience was limited for those two teachers in the intervention group. Further research is needed in this area if the effectiveness of instructional coaching is to be determined.

A fourth recommendation would be to more closely examine the type of instructional coaching implemented with the teachers. As described in Chapter 2, there was an extensive description of student-centered instructional coaching with some

description given to induction coaching. It was mentioned that Jim Knight advocated for a relationship coaching model (Hanover Research, 2015). Knight (2018) has since revised his instructional coaching towards student-centered coaching including basic components found in the student-centered coaching model (Sweeney & Harris, 2017). Conducting a future study comparing the type of instructional coaching may be valuable for future examination as school districts seek to adopt the most effective instructional coaching to enhance student achievement. Even though this study showed the control group making greater gains when examining the means of the pretest to the posttest compared to those receiving instructional coaching, perhaps more attention needs to be given to the type of coaching and those which produce greater reading achievement. Using the results-based teaching tools used in coaching, instructional practices are documented. In a future study, districts could compare student assessments and how they align with the instructional practices implemented during coaching cycles.

Qualitative research studies gather data through interviews, surveys, and observations, providing insight into how teachers reflect upon and implement coaching concepts, thereby showing the effect of coaching on instructional practices. However, the overarching goal of instruction coaching is to improve student achievement, and there is a need for further studies, both quantitative and qualitative, that specifically examine student achievement.

Implications

This quantitative research study provides one analysis on the difference in reading achievement between third-grade students with and without instructional coaching. A

statistical difference in reading achievement was not found between students receiving coaching and those not receiving coaching. Those not receiving instructional coaching showed greater gains when comparing the means of the pretest and posttest in reading achievement. This was true for this study, but additional studies are needed to accurately determine how instructional coaching affects student achievement.

Positive Social Change

This study may encourage districts to examine more closely their assumptions about instructional coaching and their procedures for implementing it. The state where this study took place provides a great opportunity for additional research. Every school district has some form of instructional coaching (Rasey, 2019). Most school districts administer the Formative Assessment System for Teachers during the year to monitor reading and math achievement (FastBridge Learning, 2016, 2020). With these two components, a school district has opportunities to examine more thoroughly how instructional coaching affects student achievement.

Conclusion

As districts seek ways to improve student achievement, instructional coaching has been seen as a means towards improvement. Collaboration and implementation of professional development within the classroom through coaching guidance have been established through research studies. But if student achievement is the goal for coaching, additional studies must be conducted to find the most effective means for using coaching in our schools. There continues to be a need for further studies on how instructional coaching affects student achievement. In this study, the means on pre- and post-testing of

those receiving instructional coaching and those not receiving instructional coaching showed those not receiving coaching increased their performance with greater gains; however, the control group scored significantly lower on the pretest when compared to the posttest. Therefore, because of this disparity, an estimated marginal means was reported to provide a clearer comparison between the control and intervention groups showing no significant difference between the groups. Before determining the effectiveness of instructional coaching, additional studies should be implemented. Instructional coaching enhances both instructional practices and collaboration with teachers, however, student achievement is the end goal and its effect on student achievement needs further examination. Our students and their achievement are the utmost concern in school districts, and this concern determines instructional practices implemented across classrooms. It is important that additional research take place on the effect of instructional coaching on student achievement. Further studies are important for us to find the most effective means to enhance student achievement.

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