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Addressing the Theory-Practice Gap Relative to Teacher-Perceived Knowledge of Effective Instructional Strategies

Laura Danielle O'Quinn
Lindenwood University

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by

Laura Danielle O'Quinn

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Shelly Fransen — 9-18-19

Dr. Shelly Fransen, Dissertation Chair — Date

Sherry DeVore — 9-18-19

Dr. Sherry DeVore, Committee Member — Date

Kathy Grover — 9-18-19

Dr. Kathy Grover, Committee Member — Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon by own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Full Legal Name: Laura Danielle O'Quinn

Signature: Laura D. O'Quinn Date: 9-18-19

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Abstract

In the field of education, a theory-practice gap occurs when research is not applied with fidelity by practicing teachers in the classroom (Ford, 2018). Student achievement is negatively impacted when teachers do not implement research-based practices consistently (Stronge, 2018). This study involved an investigation into teacher perceptions of research-based instructional strategies as a possible cause of the theory-practice gap in education. Data were collected through a mixed-methods study involving an online survey and teacher focus group interviews. The online survey was used to measure teachers' accuracy identifying the impact level of selected research-based instructional strategies from Hattie's (2009) meta-analysis. Survey data revealed teachers were not able to identify impact levels with a high level of accuracy. Data from focus group interviews revealed teacher perceptions concerning confidence using research-based instructional strategies, the frequency with which strategies are used in the classroom, preparation from teacher education programs, and district-provided professional development. The data revealed a majority of teachers do not feel prepared or confident identifying research-based instructional strategies and knowing the impact of strategies on student achievement. A concentrated and systematic focus by school districts to provide ongoing professional learning is crucial for teachers to better understand the impact of research-based strategies on student achievement.

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Chapter One: Introduction

Effective teachers make sound decisions concerning instructional practices based on knowledge and understanding of educational research (Horvath, Lodge, & Hattie, 2016). According to Cooper, Hirn, and Scott (2015), "Regardless of the student or the conditions in the classroom, the teacher is responsible for presenting instruction in a manner that yields the highest probability for student success" (p. 1). Extensive research has been done about why information gained from research is not applied and reflected in the field of education (Hattie, 2009; Horvath et al., 2016; Van der Lans, van de Grift, & Van Veen, 2018).

Chapter One includes the background of the study as well as a review of Hattie's (2009) meta-analysis of instructional strategies that impact student achievement. Implications for principals and teachers are also reviewed with regard to closing the theory-practice gap. In this chapter, the conceptual framework, the statement of the problem, and the purpose of the study are presented. The research questions that guided the study are posed, and the definition of key terms, delimitations, limitations, and assumptions of the study are detailed.

Background of the Study

A teacher's effectiveness is based upon strategies and influences used and the impact of the teacher on student achievement because of those strategies and influences (Stronge, 2018). According to Van der Lans et al. (2018), "[The] theory of teacher effectiveness has focused on identifying and clustering effective teaching behaviors but generally lacks an understanding of how effective teaching develops" (p. 247). The lack

of understanding results in a theory-practice gap, and in general, is the reason teacher practices have not changed over the past 200 years (Hattie, 2009).

Extensive investigations have been conducted about why information gained from research is not applied and reflected in the field of education (Hattie, 2009; Horvath et al., 2016; Van der Lans et al., 2018). Teachers develop skills over time and do so in a progression; safe learning climate comes first, classroom management is established second, and quality instruction develops last (Van der Lans et al., 2018). As teachers work through this learning progression, there are many variables that affect teachers' ability to learn the strategies needed and then to recognize and utilize the strategies when appropriate (Horvath et al., 2016). According to Hattie (2009), "Teachers must know when learning is correct or incorrect: learn when to experiment, and learn from the experience; learn to monitor, seek and give feedback; and know to try alternative learning strategies when others do not work" (p. 25). This is a life-long growth process over the course of careers; pre-service teachers are less effective than veteran educators at recognizing and using strategies that most positively impact student achievement (Gage, Scott, Hirn, & MacSuga-Gage, 2018).

Hattie (2009) wrote *Visible Learning* to quantitatively measure the impact of instructional strategies and influences on student achievement. *Visible Learning* is a synthesis of over 800 meta-analyses and studies of common influences and teaching practices (Hattie, 2009). According to Hattie (2009):

> Visible teaching and learning occurs when learning the explicit goal, when it is appropriately challenging, when the teacher and the student both (in their various ways) seek to ascertain whether and to what degree the challenging goal is

> attained, when there is deliberate practice aimed at attaining mastery of the goal, when there is feedback given and sought, and when there are active, passionate, and engaging people (teacher, student, peers, and so on) participating in the act of learning. (p. 22)

To determine how well a strategy or influence works, Hattie (2009) developed a barometer with "zones of effects" to indicate how likely a strategy or influence is to impact student achievement (p. 19). The measure of effectiveness used by Hattie is limited only to his research; therefore, there is a lack of pertinent literature surrounding the topic. The review is limited to Hattie (2009) and Ford (2016).

According to Hattie (2009), "An effect size provides a common expression of the magnitude of study outcomes for many types of outcome variables, such as school achievement" (p. 7). The barometer created by Hattie (2009) represents the effect size of a strategy or influence, and the hinge-point (d = 0.40) indicates a confidence rating, or likelihood the strategy or influence will increase a student's achievement typical to an academic year of growth (p. 17). This effect size, according to Hattie (2009), "sets a level where the effects of innovation enhance achievement in such a way that we can notice real-world differences, and this should be a benchmark of such real-world change" (p. 17). All strategies and influences focused upon in this study were selected from Hattie's (2009) *Visible Learning* study.

Effective teachers have strong classroom management and organizational skills, are effective planners, and embody personal qualities that improve classroom dynamics (Stronge, 2018). These teachers display a foundation of effective instructional practices in the ways they behave during instruction, introduce new information to students, model

and explain information, and keep students focused and engaged (Cooper et al., 2015). The lens teachers use when making educational decisions is crucial to the success of students; close attention should be paid to whether or not there is evidence of student success at an expected and appropriate rate (Hattie, 2009). Hattie's (2009) synthesis of over 800 meta-analyses and studies of common influences and teaching practices revealed the impact of individual strategies when compared to other strategies (Daggett, 2015).

Conceptual Framework

The conceptual framework of this study included related concepts about what makes a teacher effective (Stronge, 2018). Hattie (2009) recognized six factors related to student achievement. Of those six, three are directly connected to the teacher's influence on student achievement (Ford, 2018). The teacher, the curricula, and approaches to teaching, also known as instructional strategies, formed the framework for this study. Within these elements, the strategies with the highest predictor of improving student achievement were included (Hattie, 2017; Stronge, 2018).

The purpose of educational research is to identify solutions and offer recommendations for teachers; however, the past 50 years have not resulted in adequate progress toward closing the gap between research and actual practice (Kane, 2016). When the knowledge gained from research is not applied regularly or with fidelity to actual practice, a theory-practice gap occurs (Ford, 2018; Runesson, 2015). This gap was evaluated following elicitation of teacher perceptions of which strategies and influences have the greatest impact on student achievement and how frequently teachers reported using the most-effective strategies. This information is important, because educators who

know which strategies are most effective are more likely to implement these strategies in the classroom than are educators who do not have an understanding of strategies that have the most significant impact on student achievement (Ford, 2018; Stronge, 2018).

A conceptual framework was developed to identify and investigate three elements of effective teaching: teacher attributes, curricula, and instructional strategies (Hattie, 2017). Within each of these elements, three influences from Hattie's (2009) research were reviewed in terms of the research behind the meta-analysis and the level of impact of specific strategies on student achievement. For the purposes of this study, three research-based instructional strategies with either a high, medium, or low impact on student achievement were selected for each of the three elements of effective teaching.

The first element of effective teaching examined in this study was teacher attributes (Hattie, 2009). Teacher attributes are the characteristics of teachers that impact student achievement in the most significant way (Stronge, 2018). Collective teacher efficacy, teacher-student relationships, and teacher subject-matter knowledge were identified within the teacher attributes element of effective teaching as having a high, medium, and low effect size on student achievement, respectively (Hattie, 2017).

The second element of effective teaching examined in this study was curricula (Hattie, 2009). Curricula include the instructional approaches that most effectively deliver the curriculum (Fu & Sibert, 2017). Conceptual change programs, integrated curriculum, and whole-language programs were used in this study, because they were identified within the curricula element as having a high, medium, and low effect size on student achievement, respectively (Hattie, 2017).

The third element of effective teaching examined in this study was instructional practices or teaching strategies (Ford, 2018). This element included the instructional strategies that most effectively increase student engagement and cognition in the learning process (Hattie & Donoghue, 2016). The jigsaw method, cooperative learning, and problem-based learning were identified within the instructional strategies element as having a high, medium, and low effect size on student achievement, respectively (Hattie, 2017).

The overall focus of the study was to identify implications for principals and teachers in terms of what they can do to help close the theory-practice gap. Principal and teacher perceptions were elicited of what strategies and influencers work best, and participants were asked if teacher education programs and district-provided professional development contribute to decreasing or increasing the theory-practice gap. The effectiveness of teacher preparation programs and the manner in which preservice teachers are prepared for entry into the classroom were evaluated, as well the effectiveness of professional development opportunities for practicing teachers.

Teachers are ultimately responsible for the practical application of research; unfortunately, the gap is often widened because teachers allow their values and emotions to drive instructional decisions rather than using instructional theory as a lens to synthesize real-world application (Runesson, 2015). Principals can positively influence teacher growth and development in this area by understanding and cultivating a culture where teachers teach through a lens of theory first and emotions second (Runesson, 2015; Van der Lans et al., 2018). Providing professional learning opportunities that are relevant

to teachers, based on research, and relatable to the classroom increases teacher knowledge and pedagogy (Whitworth & Chiu, 2015).

Statement of the Problem

The gap which exists between educational research and educational practice was examined through this study (Ford, 2018; Kinyaduka, 2017; Runesson, 2015). The theory-practice gap is not a new concept and affects many fields outside of education (Kinyaduka, 2017). This gap occurs when the knowledge gained from research is not applied regularly or with fidelity to actual practice (Ford, 2018; Runesson, 2015). A theory-practice gap occurs often in the field of education and results in lowered student achievement (Runesson, 2015). Closing the theory-practice gap requires principals and teachers to work together to create a school environment where teachers can be reflective in their practice, identify errors as learning opportunities for better teaching, and feel safe to learn and take ownership of building their own understanding of effective teaching practices (Ford, 2016; Hattie, 2009).

After a thorough search of the literature, one study was found in which teacher perceptions of the implementation of effective instructional strategies were reviewed (Ford, 2016). Ford (2016) studied practices of secondary teachers to examine the frequency with which the educators utilized effective instructional strategies. Ford (2016) determined there was a need for further research in other states, at different grade levels, and into the instructional domains of the instrument used.

Researchers have examined possible causes for the theory-practice gap; however, none cited have specifically evaluated teachers' knowledge level of strategies (Ford, 2018; Kinyaduka, 2017; McGarr, 2016). The instrument used in Ford's (2016) research

was not narrowed to strategies studied by Hattie (2009), and teachers were not asked to identify which of the strategies were most effective in improving student achievement. This study was designed to determine the accuracy with which elementary teachers are able to identify research-based instructional strategies that have the highest effect on student achievement as well as how frequently teachers report using research-based instructional strategies with high effect sizes.

Purpose of the Study

The purpose of this study was to investigate teachers' perceptions and knowledge of research-based instructional strategies and the frequency with which teachers use research-based instructional strategies in the classroom. This mixed-methods study included quantitative data to reveal if practicing teachers, when given a selection of research-based instructional strategies, could correctly identify the strategies that have high effect sizes on student achievement. The study also included qualitative data in the form of teacher perceptions of college preparation and professional development on research-based instructional strategies as well as how confident teachers feel using research-based instructional strategies in the classroom.

Hattie (2017) completed a synthesis of over 50,000 studies to evaluate what happens in classrooms and the effect of specific influences on student achievement. Almost all instructional strategies have a positive impact on student success; however, most critical is being able to determine which strategies work best (Hattie, 2009; Kane, 2016). Hattie's (2009) work serves as a "barometer of success that helps teachers to understand which attributes of schooling assist students in attaining these goalposts" (p. 19). With current research easier to access than ever before, gaps still exist in

implementation, resulting in what is known as a theory-practice gap in education (Ford, 2018; Runesson, 2015). This study was designed to elicit teacher perceptions and knowledge of research-based instructional strategies to determine if lack of knowledge is a contributing cause of the theory-practice gap in education.

Research questions and hypotheses. The following research questions and hypotheses guided the study:

1. At what accuracy level are kindergarten through fifth-grade teachers able to identify research-based instructional strategies that have the highest effect size on student achievement?
2. What is the difference between the ability of new teachers (0-5 years) and veteran teachers (6+ years) to accurately identify which research-based instructional strategies have the highest effect size on student achievement?

$H2_o$: There is no significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

$H2_a$: There is a significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

3. What are the perceptions of kindergarten through fifth-grade teachers regarding research-based instructional strategies in the following areas:
    a. Frequency of use
    b. Confidence of use
    c. College training and preparation

d. Quality of professional development?

Significance of the Study

This study was conducted to address the theory-practice gap in terms of whether or not teachers have an accurate understanding of which research-based instructional strategies yield the highest effect on student achievement (Ford, 2018). Currently, there is a disconnect between education research and translation or application into actual practice (Kane, 2016). This disconnect, known as a theory-practice gap, often begins with teacher education programs, where preservice teachers are not provided opportunities to practice theory adequately in a classroom setting in order to understand which strategies should be implemented (Kinyaduka, 2017). Experienced and effective educators close this gap, and according to Masters, Birch, and Hattie (2015), "are able to engage with evidence from research and from their own context and use it to break new ground and meet new challenges" (p. 3). There are many factors to consider, which leads to great difficulty identifying and implementing strategies that will yield the desired outcomes (Horvath et al., 2016).

To reduce this difficulty and identify all factors, a coherent framework should be used so educators are presented with relevant information about effective practices that can be easily understood and utilized (Horvath et al., 2016). The research questions within the study were written to address the theory-practice gap by measuring teachers' understanding of which research-based instructional strategies have the greatest positive impact on student achievement (Ford, 2018). Teachers' perceptions of the level of preparation and training received through teacher education training and professional development were also elicited (Kane, 2016; Kinyaduka, 2017).

Definition of Key Terms

For the purposes of this study, the following terms are defined:

Accuracy levels. Accuracy is defined as the "degree of conformity of a measure to a standard or a true value" (*Merriam-Webster's*, 2018, para. 1). In this study, accuracy levels were determined by the scores calculated from the survey. Participants received 0, 1, or 2 points depending on their accurate identification of the impact level of research-based instructional strategies based upon Hattie's (2009) research.

Collective teacher efficacy. Collective teacher efficacy is a staff's shared belief that through their collective action they can positively influence student outcomes, including outcomes for those who are disengaged and/or disadvantaged (Madimetsa, Challens, & Mgadla, 2018).

Conceptual change program. A conceptual change program is a research-based instructional strategy where students learn to restructure their conceptual framework of content by identifying misconceptions and replacing them with accurate understanding of content (Hattie, 2016b).

Cooperative learning. Cooperative learning is a teaching method that involves students in the learning process so students can understand and learn the content of the subject (Gull & Shehzad, 2015; Slavin, 2011).

Effect size. Effect size is the measure of the impact of educational initiatives on achievement (Hattie, 2009). Effect sizes range from d = -0.2 to d = 1.2, with a hinge point of d = 0.4 used as a benchmark to judge effects in education (Hattie, 2009, p. 8).

Integrated curriculum. Integrated curriculum is a research-based instructional strategy that connects different areas of study by linking content across subject-matter lines while emphasizing unifying concepts (John, 2015).

Jigsaw method. The jigsaw method is a cooperative learning technique developed by social psychologist Elliot Aronson in 1971 (Karacop, 2017). The technique hinges on each student becoming an expert on a certain topic, and after communication and discussion with others reading the same text and researching the same overall topic or unit, individual students share their findings with their original "home" group (Karacop, 2017).

Meta-analysis. Meta-analysis is defined as "a quantitative statistical analysis of several separate but similar experiments or studies in order to test the pooled data for statistical significance" (*Merriam-Webster's*, 2018, para. 1).

Problem-based learning. Problem-based learning is an instructional learner-centered strategy that empowers students to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery, 2015).

Qualtrics. Qualtrics is an online survey tool used for quantitative data collection (Qualtrics, 2019).

Research-based instructional strategies. Research-based instructional strategies are teaching strategies, techniques, or influences informed by objective evidence such as educational research or performance data of schools, teachers, and/or students to determine effects on student performance (Marzano, Pickering, & Pollock, 2001).

Teacher-student relationships. The development of teacher-student relationships is a research-based instructional strategy that refers to teachers' actions of building positive relationships with students, creating classroom environments conducive to learning, and meeting students' developmental, emotional, and academic needs (Hattie, 2009).

Teacher subject-matter knowledge. Teacher subject-matter knowledge is the teacher's knowledge and subject mastery of the content taught (DeWitt, 2015).

Whole-language reading. Whole-language reading is a research-based instructional strategy in which students learn to read through whole pieces of language and immersion in authentic literature rather than through reading strategies for decoding or comprehension (Hattie, 2009).

Delimitations, Limitations, and Assumptions

The scope of the study was bounded by the following delimitations:

Time frame. The study was conducted during the spring of 2019.

Location of the study. The location of the study included eight public school districts in southwest Missouri.

Sample. The sample of the study included kindergarten through fifth-grade teachers of the selected school districts in southwest Missouri.

Criteria. Participants in the study only included kindergarten through fifth-grade teachers in participating school districts.

The following limitations were identified in this study:

Sample demographics. The sample was a limitation because the study only focused on kindergarten through fifth-grade teachers in the selected school districts.

Instrument. The survey and interview questions were limitations because both instruments were created by the researcher based on information gathered from the literature review. Quantitative responses were dependent upon participant agreement to complete the online survey. Qualitative responses for the focus groups were also dependent on participant agreement to complete the focus group interviews.

Self-reported data. The data were a limitation since the teachers self-reported their level of knowledge and frequency of use of research-based instructional strategies.

The following assumptions were accepted:

1. The responses of the participants were offered honestly and willingly.
2. The sample was representative of the general population of educators who hold teaching certificates from the Missouri Department of Elementary and Secondary Education (MODESE).

Summary

The theory-practice gap in the field of education is a result of education research not being applied to education practice (Kane, 2016). To address possible causes of the theory-practice gap, teacher perceptions of knowledge of research-based instructional strategies and the frequency teachers use instructional strategies in the classroom were evaluated through the lens of Hattie's (2009) synthesis. The most effective teachers have a correct understanding of what works best and concurrently implement best practices with fidelity (Masters et al., 2015). Measuring teachers' perceived knowledge of which research-based instructional strategies have the most positive effect on student achievement contributed to research which addresses the theory-practice gap (Ford, 2016).

Hattie's (2009) meta-analysis on research-based instructional strategies provides a quantitative measure for which strategies work best to leverage student achievement. Teacher preparation and ongoing training equip educators with research to apply in actual practice (Cooper et al., 2015). The instructional strategies teachers use in the classroom are often based on how the teacher was taught in school rather than on research or learning from teacher preparation or professional development (Steins, Wittrock, & Haep, 2015; Van der Lans et al., 2018). Improving teacher effectiveness requires relevant and ongoing professional development where teachers understand the "why" behind the research and how to apply instructional strategies with fidelity in the classroom (Hattie & Donoghue, 2016).

Within Chapter One, the background of the study, the conceptual framework, and a statement of the problem were presented. The purpose of the study and the research questions, along with the significance of the study, were introduced. Finally, definitions of key terms and delimitations, limitations, and assumptions were addressed.

In Chapter Two, a review of the current literature is provided. A conceptual framework was developed to organize Hattie's (2009) meta-analysis of research-based instructional strategies into three themes. The first theme is teacher attributes and includes strategies influenced by the teacher. Collective teacher efficacy is reviewed as the high-impact strategy for this section. Teacher-student relationships are reviewed as the medium-impact strategy for this section, and teacher subject-matter knowledge is reviewed as the low-impact strategy for this section.

The second theme includes teaching strategies used to effectively teach content in a grade level. The jigsaw method is reviewed as the high-impact strategy for this section.

Cooperative learning is reviewed as the medium-impact strategy, and problem-based learning is reviewed as the low-impact strategy for this section.

Curricula are the third theme and includes universal instructional strategies used in any grade level or content area. Conceptual change program is reviewed as the high-impact strategy in this section. Integrated curriculum is reviewed as the medium-impact strategy, and the use of whole-language programs is reviewed as the low-impact strategy for the section. Finally, effectiveness of teacher preparation programs and district-provided professional development is reviewed as a factor contributing to the theory-practice gap in education.

Chapter Two: Review of Literature

Chapter Two includes a review of the literature to build background knowledge regarding Hattie's (2009) meta-analysis of research-based instructional strategies and impact on student achievement. The review was designed to include the research available on current instructional strategies used in elementary classrooms. The chapter is organized using a conceptual framework and includes a review of nine research-based instructional strategies from Hattie's (2009) meta-analysis.

The literature is organized using three of Hattie's (2009) six elements that directly impact student achievement: teacher attributes, curricula, and teaching strategies. Within these three elements, three research-based instructional strategies with a high, medium, and low impact on student achievement are discussed. The review also includes how effective strategies are used in the classroom, the impact of professional development on the use of these strategies, and the overall effectiveness of teacher education programs in preparing preservice teachers to use research-based instructional strategies in the classroom.

Conceptual Framework

Specific attributes, or essential characteristics, can be used to delineate an above-average teacher from an average or below-average teacher (Stronge, 2018). Hattie (2009) recognized six factors related to student achievement, with three directly connected to the teacher's influence on student achievement. The teacher, the curricula, and approaches to teaching (teaching strategies) are the three elements from Hattie's (2009) meta-analysis examined in this study to determine perceptions of teachers regarding which research-

based instructional strategies have the greatest impact on improving student achievement (Stronge, 2018).

Teacher attributes include characteristics of teachers that are often difficult to quantify but directly impact student learning (Goldhaber, 2016). The curricula element refers to research-based instructional strategies that relate to teaching the curriculum rather than just the content through instructional resources (Hattie, 2009). Approaches to teaching, also referred to as teaching strategies, are the universal teaching practices educators use across all content areas to maximize student learning (Hattie & Donoghue, 2016).

According to Hattie (2009), the three elements of teacher attributes, curricula, and teaching strategies are essential components teachers need to be successful. When teachers are not successful, a reason is often that educational research is not applied to actual practice, causing a theory-practice gap to occur (Kane, 2016). In relation to the theory-practice gap, instructional practices with the highest effect on student achievement are not used regularly or with fidelity to result in the returns projected by researchers (Cooper et al., 2015; Ford, 2016).

The three teacher attributes examined in this study included collective teacher efficacy, teacher-student relationships, and teacher subject-matter knowledge (Hattie, 2017). In his meta-analysis, Hattie (2017) reported collective teacher efficacy as having a $d = 1.57$ (high) effect on student achievement (Table 1). Teacher-student relationships yielded a $d = 0.52$ (medium) effect on student achievement, and teacher subject-matter knowledge yielded a $d = 0.11$ (low) effect on student achievement (Hattie, 2017, Table 1).

In his research on curricula, Hattie (2009) labeled such influences or strategies related to teaching the curriculum, rather than just the content of the curriculum, that have an influence on student success. In his meta-analysis, Hattie (2009) reviewed the following aspects with regard to curricula: balancing basic knowledge and deep understanding when teaching concepts, focusing on helping students develop strategies for learning new concepts, and utilizing strategies and programs that effectively teach specific skills as well as a deeper knowledge of the content. An important note for this theme is that many of these strategies can only effectively be used within a specific content or developmentally appropriate area to yield the effects reported by Hattie (2009).

The three strategies identified within the curricular theme for this study included the following: conceptual change programs, integrated curriculum, and whole-language programs. These strategies were selected because they have been found to have high, medium, and low effects on student achievement (Ford, 2016; Kane, 2016). Conceptual change yielded a $d = 0.99$ (high) effect on student achievement when implemented with fidelity (Hattie, 2017, Table 1). Conceptual change programs follow a framework where concepts are introduced, and relevant and common misconceptions are also discussed to allow the learners to make new and correct connections about information and concepts (Cetin, Ertepinar, & Geban, 2015).

Integrated curriculum, also referred to as thematic units, yielded a $d = 0.47$ (medium) effect on student achievement (Hattie, 2017, Table 1). With the lack of a consistent theoretical framework, implementing an integrated curriculum with fidelity can be confusing and cumbersome for teachers (Fu & Sibert, 2017). An integrated

curriculum approach is not a new concept and was founded on the theory students learn best when curriculum is taught in a coherent and whole method through a real-world problem or situation (John, 2015). Whole-language programs yielded a $d = 0.06$ (low) effect on student achievement (Hattie, 2017, Table 1). A whole-language program is a method of teaching reading where learners are immersed in rich and relevant literature to acquire word knowledge based on context (Gee, 1995).

Approaches to teaching, also referred to as instructional strategies in this study, are the general teaching practices educators can use across all content areas to maximize student learning (Hattie, 2009). Effective instruction includes the teacher's behaviors during the lesson, how the concept is introduced at the onset of the lesson, and the way the teacher brings the content to the students' level and models expectations (Cooper et al., 2015). Teachers can enhance teaching practices by defining objectives and setting success criteria, providing students with multiple opportunities for practice, understanding their role in the instructional process, collaborating effectively with other teachers, and viewing feedback and reflection as a way to continually improve practice (Hattie, 2009). In relation to the theory-practice gap, instructional practices with the highest effect on student achievement are not used regularly or with fidelity to see the return projected from research (Cooper et al., 2015).

The jigsaw method yields the highest impact of the three instructional strategies focused upon in this study with a $d = 1.2$ (high) effect on student achievement (Hattie, 2017, Table 1). Teachers use this specific cooperative learning strategy to have students work collaboratively to learn and teach one another instructional content (Karacop, 2017). Content is divided and assigned to individual students and then taken back to the

collaborative group to teach others (Karacop, 2017). Cooperative learning generally yields a $d = 0.40$ (medium) effect on student achievement, the same growth expected for one year of academic learning (Hattie, 2017, Table 1). A large number of cooperative learning strategies fall under this umbrella (Hattie, 2009). Cooperative learning strategies provide opportunities for students to learn from one another and can boast a positive impact on student achievement when implemented with fidelity and in appropriate instructional environments (Altun, 2017).

Problem-based learning was the final strategy studied in this review and is considered a low-effect strategy, yielding only a $d = 0.26$ effect on student achievement (Hattie, 2017, Table 1). Problem-based learning is a student-centered instructional strategy built around a framework of research, integrating theory and practice, and in the end applying knowledge gained into real-world solutions (Savery, 2015). The drawback and reason problem-based learning yields low effects on student achievement, according to Hattie (2016b), is because teachers attempt to utilize this strategy too soon, and students do not have the basic knowledge and skills to develop the deeper understanding needed for the critical thinking required with this strategy.

The final section in this review of literature examines implications for principals and teachers to consider to close the theory-practice gap (Ford, 2016). The most effective principals recognize teacher practices directly relate to student success and that a focus on the use of effective strategies is more important than the outcomes (Hattie, 2016b). Principals can positively influence teacher growth and development by providing professional development and training rooted in research and theory yet applicable to current teacher practice (Van der Lans et al., 2018).

Effective teachers must be able to "manage their classroom, give feedback, make practical plans and wise decisions, but they must also be more than performers, and lifelong learners of subject matters" (Owoh, 2016, p. 120). The responsibilities of teachers are so great that the future and quality of the society is dependent on the work they do (Owoh, 2016). Effective teachers share a mindset or collective efficacy that all students can succeed at proficient levels (Hattie, 2017; Saphier, 2016). When teachers work together and share similar views that their efforts make a difference no matter the circumstance of the children, they are more effective in terms of increasing student achievement (Donohoo, Hattie, & Eells, 2018). According to Cooper et al. (2015), "Each classroom is characterized by students who are unique by their age, skill level, background, culture, desires, likes and dislikes, history in school, and experience with instruction" (p. 1). Effective teachers are aware of these factors and make adjustments to instruction despite outside factors to help students accomplish educational goals (Owoh, 2016).

The framework for this study was supported by Hattie's (2009) meta-analysis of influences on student achievement and by teacher standards for effectiveness as outlined by the MODESE website (2013b). Hattie's (2017) most recent meta-analysis included over 250 influences that impact student achievement. The framework of this study was organized around three major themes from Hattie's (2009) *Visible Learning*. Teacher attributes, curricula, and instructional strategies are essential components to overall teacher effectiveness (Ford, 2018). Within these themes, nine influencers were selected from Hattie's (2009) research, which yield high, medium, and low effect sizes in terms of student achievement.

Teacher Attributes

Teacher attributes are made up of influences impacted by the teacher (Hattie, 2009). Teachers influence student success in many ways (Goldhaber, 2016). The effective teacher creates a classroom environment which supports academic and social learning (Gage et al., 2018). Hattie (as cited in Steins et al., 2015) noted teachers who demonstrate "a combination of warm support and high expectations have a demonstrable positive effect on the development of students" (p. 2047). There is also a direct correlation between the use of effective classroom management strategies and students' level of engagement in instruction (Gage et al., 2018).

This does not come naturally for all teachers, and unfortunately, there is little support provided to preservice teachers with regard to transferring knowledge of effective practice into actual practice (Gage et al., 2018). According to Gage et al. (2018), "A high percent of teachers report that student behavior is a significant impediment to their success in the classroom" (p. 302). When teachers receive training that has a positive impact on teaching and learning in their classrooms, it promotes a positive classroom environment, and teachers feel more equipped to utilize positive, proactive strategies (Gage et al., 2018). Many factors impact student achievement; however, there is nothing more important than the impact of the teacher (Madimetsa et al., 2018; Van der Westhuizen, Mosoge, Swanepoel, & Coetsee, 2005).

Collective teacher efficacy. Collective teacher efficacy, according to Hattie (2016a), is "the collective belief of teachers in their ability to positively affect students" (para. 1). Collective teacher efficacy has an effect size of $d = 1.57$ and is strongly correlated with increased levels of student achievement (Waack, 2018, para. 1). The

concept of collective teacher efficacy came from Bandura's (1977) research in the 1970s on working group dynamics (Donohoo et al., 2018). Bandura's (1977) research revealed the level of confidence exhibited by the group directly influences the students' level of success (Donohoo et al., 2018).

In 2011, Eells completed a meta-analysis of 26 studies on collective efficacy and student achievement and determined, "The beliefs teachers hold about the ability of the school as a whole are strongly and positively associated with student achievement across subject areas and in multiple locations" (p. 110). In her study, Eells (2011) determined the weighted average effect size for collective efficacy was 0.617, which was converted to Cohen's d = 1.56 (Waack, 2018, para. 2). Collective teacher efficacy is three times more effective than parental involvement or student motivation and is two times more effective than prior knowledge (Donohoo et al., 2018, p. 40).

Schools with high levels of collective teacher efficacy display a well-developed work ethic where teachers persevere through difficulty, and they welcome failure as a challenge (Madimetsa et al., 2018). According to Donohoo et al. (2018), "[Teachers] through their combined efforts can positively influence student outcomes, including those who are disengaged, unmotivated, and/or disadvantaged" (p. 1). School leaders can encourage collective efficacy by making teacher collaboration a priority (Madimetsa et al., 2018). Collective teacher efficacy can impact student achievement on a whole-school level (Hattie, 2016a). Research shows when teachers within an entire school share the same belief that their actions truly impact and influence student outcomes, overall student achievement improves (Donohoo et al., 2018). To be effective, teachers cannot use other

factors as an excuse for students' lack of progress (Hattie, 2016a). Effective teachers do their best to make a difference despite factors that might interfere (Hattie, 2016a).

Teacher-student relationships. Teacher-student relationships were the second teacher attribute strategy addressed in this study. This influence has an effect size of d = 0.52 and is a medium-level strategy (Hattie, 2017, Table 1). This effect size is a decrease from Hattie's first meta-analysis in 2009, when the strategy measured at d = 0.72 (Hattie, 2009, p. 118. Teacher-student relationships are defined as the "generalized interpersonal meaning students and teachers attach to their interactions with each other" (Wubbels, Brekelmans, Mainhard, den Brok, & van Tartwijk, 2016, p. 128). Positive relationships are developed with students when teachers utilize a variety of skills, including listening, empathy, and a positive outlook for one another (Hattie, 2009). Attachment theorists believe children become independent risk-takers when they experience emotionally supportive adult relationships in a stable environment (Wubbels et al., 2016). Emotional support and positive relationships are important at all age levels (Wubbels et al., 2016).

Positive teacher-student relationships beginning in the early years reduce antisocial behavior in students and prevent students with tendencies for internalizing from developing behavior problems long-term (Hattie & Yates, 2013; Saphier, 2016). In a study conducted by Hattie and Yates (2013), teachers' improvements in relationships with students at the high school level were measured. The researchers determined student grades improved by nine percentile points in the year following the intervention with relationships (Hattie & Yates, 2013, p. 22). Positive teacher-student relationships impact motivation and student achievement even beyond the year during which the

teacher forms the relationship with the student (Harbour, Evanovich, Sweigart, & Hughes, 2015).

Teacher-student relationships play a vital role in the foundational development of competencies early in life (Koca, 2016). Effective teachers build relationships with students that are "emotionally close, safe, and trusting, that provide access to instrumental help, and that foster a more general ethos of community and caring in classrooms" (Wentzel, 2016, p. 211). These positive teacher-student relationships create an inviting classroom culture that encourages student learning (Koca, 2016). A sense of security improves a student's overall functioning in the classroom (Wubbels et al., 2016). Positive teacher-student relationships improve learning and better enable students to handle the difficulties and demands of school (Wubbels et al., 2016).

Negative teacher-student relationships have adverse effects (Wubbels et al., 2016). Negative teacher-student relationships are correlated with lowered student achievement as well as low self-esteem and ongoing conflict with teachers and peers (Koca, 2016). Cornelius-White (2007) reported the level of quality of teacher-student relationships is directly related to student achievement. Positive teacher-student relationships are not just beneficial to students but also correlate to increased teacher job satisfaction and decreased teacher burnout (Wubbels et al., 2016). Positive relationships provide a context in which high expectations and performance can live (Wentzel, 2016). Teachers who have positive relationships with students set high expectations for learning, and students are motivated to achieve at higher levels (Wentzel, 2016).

Teacher subject-matter knowledge. Teacher subject-matter knowledge was the third teacher attribute strategy examined within the study and has an effect size of d =

0.11 (Hattie, 2017, Table 1). The basis of teacher subject-matter knowledge includes competencies such as knowledge, abilities, and skills of teachers related to their grade level or content area (Abid, Hussain, Mahmood, Saeed, & Shoaib, 2017). The nature and concept of teaching revolve around the use of methodologies and understanding to convey ideas and thoughts (Abid et al., 2017).

Hattie determined teacher subject-matter knowledge is a low-level influencer which only boosts student achievement minimally (Cooper et al., 2015). The effect size given to teacher subject-matter knowledge of $d = 0.11$ is well below the average year's growth of $d = 0.40$ (DeWitt, 2015, para. 6; Hattie, 2009, p. 114). Hattie (2009) emphasized teacher subject-matter knowledge could be low due to the fact teachers already have an acceptable amount of knowledge related to their content area; therefore, teacher subject-matter knowledge does not vary enough to factor into the effect on student achievement. Essentially, a teacher's level of subject-matter knowledge is helpful but does not have the impact needed to improve student achievement levels, especially with students who struggle (DeWitt, 2015).

Teacher attributes, including teacher-student relationships, result in effects on student achievement that endure (Hattie, 2009). The teacher attribute with the highest effect in terms of student achievement is collective teacher efficacy (Hattie, 2016b). Teaching practices directly impact the probability of student success (Gage et al., 2018). Hattie (as cited in Cooper et al., 2015) noted, "Although there is no guarantee for any student or any instructional strategy, some strategies offer a better probability for success than do others" (p. 1). To increase effectiveness, educators need to be self-reflective,

especially with strategies or methods that may not be maximizing overall student achievement (Mayer & Alexander, 2016).

Teaching Strategies

Teaching strategies are the second element of effective teaching (Hattie, 2009). Teachers who are reflective about the methods and strategies that maximize student learning are more effective and successful at increasing student achievement (Mayer & Alexander, 2016). Hattie (2009) reviewed numerous strategies and evaluated what makes some more successful than others. Many instructional strategies have a worthwhile effect on student achievement (Ford, 2018). According to Hattie (2009):

> Effective teaching occurs when the teacher decides the learning intentions and success criteria, makes them transparent to the students, demonstrates them by modeling, evaluates if they understand what they have been told by checking for understanding, and re-telling them what they have told by tying it all together with closure. (p. 236)

Teachers committed to using effective strategies, relearning when necessary, and improving with professional development have the greatest impact on student achievement (Mayer & Alexander, 2016).

Jigsaw method. The jigsaw method is a specific form of cooperative learning, which yields high effects on student achievement (Karacop, 2017). Elliot Aronson developed the jigsaw method while working at the University of Texas in the early 1990s (Bostina-Bratu & Negoescu, 2016; Miaz, 2015). Hattie (2017) reported the jigsaw method boasts a $d = 0.99$ effect on overall student achievement (Table 1). This method is

considered a high-effect strategy because of the benefits to all students when implemented with fidelity (Hattie, 2009).

One of the main reasons the jigsaw method has a higher effect size than the overall strategy of cooperative learning is because every student is assigned part of the lesson to learn and then to teach others (Karacop, 2017; Roberts & VanDeusen-MacLeod, 2015). Essentially, the content from the whole lesson is divided into parts and assigned to groups of students (Bostina-Bratu & Negoescu, 2016). The teacher begins by introducing the topic to students and breaking the new content into subtopics (Nur Hafizah, 2016). The teacher then divides the class into groups and gives each student a subtopic on which to become an expert (Karacop, 2017). Students who have the same subtopic then flex into a new group of students, and together, they research and discuss to become experts (VanDeusen-MacLeod, 2015). Following this process, students return to their base groups and teach the rest of their peers the information learned from the new content (Bostina-Bratu & Negoescu, 2016).

The jigsaw method promotes positive interdependence, individual accountability, positive interaction, social skills, and group processing (Eachempati, Kumar, & Ismail, 2017; Sagsoz, Karatas, Turel, Yildiz, & Kaya, 2017). These elements are essential pieces because they require students to work effectively with one another, hold each other accountable, and learn important soft skills such as listening, decision making, and feedback (O'Leary, Wattison, Edwards, & Bryan, 2015). The jigsaw method is a strategy where the teacher creates a learning environment that fosters student collaboration and gives value to every student in the classroom (Eachempati et al., 2017). This method also helps to eliminate competition and power among students (Eachempati et al., 2017).

Many studies have revealed the positive impact of the jigsaw method on student achievement (Eachempati et al., 2017; Nur Hafizah, 2016). In their studies, Eachempati et al. (2017) and Nur Hafizah (2016) revealed the jigsaw method to be as effective with low and medium-achieving students as with high-achieving students. Students reported an increase in self-confidence and overall motivation in comparison to traditional teaching methods (Nur Hafizah, 2016). Teachers must have a deep understanding of content knowledge to plan tasks that are aligned and appropriate to ensure effectiveness (O'Leary et al., 2015; Miaz, 2015). Teachers also need to develop an instructional plan for an organized jigsaw lesson that is aligned to content relevant to the grade level and content standards (O'Leary et al., 2015). This can be a challenge for new or inexperienced teachers who often lack the knowledge of processes in facilitating student-centered learning (O'Leary et al., 2015).

Cooperative learning. Cooperative learning strategies were developed by Dr. Spencer Kagan in the early 1980s and have grown to include more than 100 techniques (Miller, 2017). Cooperative learning is a teaching method where students must work together in small groups to achieve a common academic goal (Çepni & Öner, 2015; Miller, 2017; Slavin, 2015). In his meta-analysis, Hattie determined cooperative learning to have an effect size of $d = 0.4$ (Hattie, 2017, Table 1). While this technique is more effective than traditional teaching strategies, the strategy is considered a medium-level strategy with only average effects on student achievement (Capar & Tarim, 2015).

Students collaborate and communicate with one another, build on one another's knowledge, and promote positive interpersonal relationships (Hattie, 2009). Through this process, students work together as a team to develop a product or outcome while using

strategies to work together effectively as a group (Altun, 2017). The reason why this strategy only has a moderate effect size is due to the difficulty of implementation in all content areas, and many students struggle to work together effectively (Miller, 2017). The cooperative learning method also takes an increased amount of time and energy to implement (Gull & Shehzad, 2015).

When used effectively, cooperative learning can result in many benefits, including increased self-esteem, engagement, motivation, and improved complex thinking (Killian, 2017). Cooperative learning is most effective when students have an adequate amount of background knowledge to participate actively in discussion and learning among peers (Miller, 2017). Cooperative learning techniques are most useful with introducing new concepts, promoting retention of information, and problem-solving (Killian, 2017; Miller, 2017).

While there are over 100 cooperative learning techniques, four principles are essential for effective implementation of cooperative learning (Altun, 2017). Positive interdependence takes into account the role of the individuals within the group and how they complement or work with other members of the group (Cetin et al., 2015). The performance of the individual is heightened through accountability in terms of the group's overall success (Altun, 2017). Face-to-face interaction is the third principal essential in improving the overall process of cooperative learning and creates a sense of responsibility among members of the group (Gull, 2015). Social skills are acquired and improved on as the cooperative learning group works together more often (Slavin, 2015). Evaluation of group processing is the final principle, where students reflect on the outcomes and productivity of the team (Altun, 2017).

Even with a moderate effect size, cooperative learning techniques are more effective than traditional teaching methods (Gull & Shehzad, 2015). The difficulty is that "even well-established cooperative learning systems differ tremendously" (Kagan, 2014, p. 4). Overall, cooperative learning has a positive effect on student achievement, teacher-student relationships, cohesiveness of the class, and social skills (Çepni & Öner, 2015; Kagan, 2014).

Problem-based learning. Problem-based learning was developed in the medical field approximately 30 years ago as an alternative instructional approach to traditional teaching (Lupton, 2017). Problem-based learning is a student-centered teaching strategy, where knowledge and skills are acquired through research, critical thinking, and problem solving (Savery, 2015). Problem-based learning is structured around a cycle which begins with a relevant problem and follows an inquiry-based approach (Lupton, 2017). Within problem-based learning, students learn to collaborate in a meaningful way and work toward being self-directed learners (Yew & Goh, 2016).

From Hattie's (2009) meta-analysis, problem-based learning has a low effect size on student achievement of $d = 0.15$ (Lupton, 2017, para. 21). According to Hattie (2016b), "The reason it [problem-based learning] comes out very low on the chart is because most teachers introduce it far too early. Some students have it while others get left behind" (para. 2). Problem-based learning has gained popularity, and even with the lack of research to support its effectiveness, problem-based learning has become common throughout all educational settings from elementary school to the university level (Hattie, 2017).

Problem-based learning has proven more effective than traditional teaching methods in relation to performance-based assessments, long-term retention, and skills performance (Yew & Goh, 2016). During problem-based learning opportunities, teachers serve as active participants and partners with students to promote critical thinking and problem-solving skills (Gorghiu, Drăghicescu, Cristea, Petrescu, & Gorghiu, 2015). Teachers who support problem-based learning advocate the instructional strategy improves students' ability to think critically and work collaboratively (Yew & Goh, 2016).

A wide variety of teaching strategies have varied effects on student achievement (Hattie, 2009). For the purpose of this study, the jigsaw method yields the highest effect size of $d = 1.20$ (Hattie, 2017, Table 1). According to Hattie (2009), "Effective teaching strategies involve much cooperative pre-planning and discussion between teachers, optimizing peer learning, and require explicit learning intentions and success criteria" (p. 236). What is noticeable and concerning is the theory-practice gap between what research shows and what teachers implement in their classrooms (Ford, 2018). According to Ford (2018), "Teachers use effective practice instructional strategies at a rate of 65%," and "as level of education increases, the likelihood of strategy use does not increase, but the intensity of the use increases" (p. 158). When teachers are reflective in their practice and evaluate the effect of teaching strategies on student learning, overall student success is maximized (Mayer & Alexander, 2016).

Curricula

The third element of effective teaching examined in this study was curricula. The three curricula-related influences reviewed in this study included conceptual change

programs, integrated curriculum, and whole-language programs (Hattie, 2017). The strategies teachers implement are more important than the actual content of the curriculum (Horvath et al., 2016). Effective strategies ensure "appropriately challenging surface, deep, and conceptual knowledge and understanding" (Hattie, 2009, p. 159). For students, the teaching and use of these strategies can lead to deeper engagement, increased problem-solving skills, and a sense of ownership in the learning process (Van de Lans et al., 2018).

Conceptual change program. Conceptual change programs or texts are one of the most effective influences in education, particularly in the content of science (Cetin et al., 2015). Conceptual change instruction has a high effect size of $d = 0.99$, which is equal to over two years of growth (Hattie, 2017, Table 1). Conceptual change is a model based on Piaget's theory and is a process where a learner's schema is challenged and changed as new information and content are presented, which may contradict current paradigms (Nadelson, Heddy, & Jones, 2018).

Conceptual change is defined as a learning structure for modifying a student's current schema to lead the student through a process to form a new schema while still being able to articulate why the prior schema was incorrect (Nadelson et al., 2018). Most often, teachers introduce concepts in lessons with the assumption students do not have prior ideas or experiences about the concept (Cetin et al., 2015). Conceptual change goes beyond connecting information to students' prior knowledge (Killian, 2017). Teachers who use conceptual change are aware of students' existing paradigms about the topic and address the beliefs and conceptions of the students by discussing the inaccuracies

(Killian, 2017). The teacher then replaces the misconception by explaining the correct information in a simple and easy-to-understand way (Killian, 2017).

Conceptual change programs lead to a deeper understanding (Cetin et al., 2015). The strategy is most often used in science education because students are more likely to have incorrect knowledge or conceptions about specific content areas (Nadelson et al., 2018). Although much of the research on conceptual change programs is in the field of science, the same theory can be correlated when introducing any new concept, no matter the content area (Hattie, 2016b). The conceptual changes strategy is comprised of four critical steps (Killian, 2017). These steps involve identifying misconceptions, creating a mental disturbance, explaining the correct conceptions, and having students mentally engage in correct conceptions related to a topic (Killian, 2017). A schema is difficult to change once formed, especially if the learner is not open to accepting new ideas (Cetin et al., 2015). Misconceptions serve as obstacles and get in the way of new learning and meaningful knowledge and understanding (Cetin et al., 2015). Conceptual change programs are effective because they provide a structure for removing obstacles and creating a new pathway for learning (Killian, 2017).

Integrated curriculum. Integrated curriculum is a method where instruction is inclusive of multiple content areas organized as themes connected to real-world situations (John, 2015). Integrated curriculum yields a $d = 0.47$ effect size on student achievement, which is just over one year of typical growth (Hattie, 2017, Table 1). An integrated curriculum is based on student-centered learning, which motivates and engages students while improving overall achievement and motivation (Costley, 2015; Mohr & Welker,

2017). When implemented with fidelity, students increase critical thinking skills, cooperative learning, and real-world application (Costley, 2015).

Implementing an integrated curriculum is complex and requires teachers to have strong overall teaching competency as well as deep content knowledge and pedagogical knowledge of how to effectively implement the strategy (Fu & Sibert, 2017). Often teachers struggle to implement with fidelity due to a lack of professional development (John, 2015). Results from studies also show teachers use varied levels of implementation, which disrupts the level of fidelity as well as the overall impact on student success (Costley, 2015). Other factors that affect the success rate of the integrated curriculum include teacher planning and collaboration time as well as a lack of resources and support (Mohr & Welker, 2017). Preservice teachers struggle with preparing creative lessons and effectively integrating different content areas to create a cohesive framework for the implementation of an integrated curriculum (Fu & Sibert, 2017).

There are several known positive effects of an integrated curriculum, including gains in student achievement (Costley, 2015). The integrated curriculum allows students to gain a deeper understanding of the practicality of the content being taught and provides opportunities for students to learn through hands-on activities (John, 2015). Benefits of using an integrated curriculum approach include improved teacher-student relationships, relevant learning for students, and increased relevance to taught curriculum (Mohr & Welker, 2017).

Whole-language programs. The whole-language approach is a strategy for teaching reading where the learner acquires reading skills through the frame of text

(Bowers, 2018; Gee, 1995). A whole-language approach to teaching reading yields a d = 0.06 effect size, which is considered a low-level strategy (Hattie, 2009, p. 137). The whole-language approach to teaching reading gained popularity beginning in the 1980s, as classroom teachers shifted from phonics-based instruction through basal series to immersing learners into authentic reading to acquire meaning through context (Bowers, 2018; Willis, 1995).

Many researchers have indicated a whole-language approach to teaching reading yields a low impact on student achievement (Stahl & Miller, 1989). Stahl and Miller (1989) showed zero effects when word recognition and reading comprehension were measured through a whole-language approach (p. 88). Jeynes and Littell (2000) studied the effect of the whole-language approach on overall literacy achievement of students in kindergarten through third grade and found students of low socio-economic status receiving instruction based on a whole-language approach performed lower than students of similar status who received instruction from basal readers (p. 21).

From his meta-analysis, Hattie (2009) reported, “Whole language programs have negligible effects on learning to read—be it on word recognition or on comprehension” (p. 138). The whole-language approach to teaching reading is not effective because a significant emphasis is placed on building comprehension and acquisition of word knowledge rather than an intentional focus on teaching decoding strategies through phonics (Hattie, 2009). A whole-language approach to reading has also not proven to be effective for students with learning disabilities or serious reading delays (Oladele & Oladele, 2016).

Much progress has been made in terms of the science of learning and instruction (Mayer & Alexander, 2016). Hattie (2016b) recognized curricula learning strategies are only effective when students are aware of success criteria and the phase of the learning process and when students are acquiring new knowledge or synthesizing current understandings. According to Hattie (2016b), the most effective teachers are flexible with the selection and use of strategies because what worked for a student in the past is not always guaranteed to work in the future.

College Training and Preparation

Research in preparation for beginning teachers provides insight into how teacher competence is developed and how knowledge and practices transfer into actual teaching practice (Santagata & Yeh, 2016). Current teacher preparation programs have little variation in effectiveness, and the only measurable difference is among individual teacher practices rather than program design (Koedel, Parsons, Podgursky, & Ehlert, 2015). Developing teachers and improving teacher education programs should include input from all stakeholders and incorporate a balance of practical and research-based components (Kumashiro, 2015). Currently, preservice teachers who receive little or ineffective training in their teacher preparation programs are two to three times more likely to leave education after teaching only one year as compared to teachers who receive comprehensive preparation (Sutcher, Darling-Hammond, & Carver-Thomas, 2016, p. 5).

According to Sutcher et al. (2016), “A growing body of evidence indicates that attrition is unusually high for those who lack preparation for teaching” (p. 6). Approximately 19% to 30% of new teachers leave education within their first five years

in the field (Sutcher et al., 2016, p. 6). Attrition rates are even higher when new teachers do not have access to quality mentoring throughout the first few years of teaching (Sutcher et al., 2016). Low teacher retention has increased interest nationwide in holding teacher preparation programs accountable for teacher effectiveness in the classroom (Koedel et al., 2015).

In 2016, the United States Department of Education released proposed teacher preparation regulations for higher education. The proposal "requires states to assess and rate every teacher preparation program every year with four Performance Assessment Levels (exceptional, effective, at-risk, and low-performing), and states must provide technical assistance to 'low-performing' programs" (Kumashiro, 2015, p. 1). With this pressure, universities must make improvements to teacher education programs or potentially lose funding, state approval, and most importantly, student financial aid (Kumashiro, 2015). Universities that work collaboratively with schools and communities are the most likely to redefine teacher preparation programs to support and develop effective teachers (Zeichner, Payne, & Brayko, 2015).

To succeed in preparing teachers to work effectively with students, especially with disadvantaged and underserved students, teacher education programs need to change dramatically to meet the needs of education in the 21st century (Cochran-Smith et al., 2016). To be successful, teachers must "enact practice that improves the learning and enhances the life chances of students traditionally not well-served by the system" (Cochran-Smith et al., 2016, p. 6). According to Zeichner et al. (2015), "The way in which college- and university-based teacher education is usually structured is fundamentally undemocratic and largely fails to strategically access knowledge and

expertise, which exists in schools and communities that could inform the preparation of teachers" (p. 123). University models have primarily included education programs that deliver academic knowledge without effective and adequate application into practice (Zeichner et al., 2015). This has resulted in preservice teachers who are unable to effectively translate research-based academic knowledge into practice (Zeichner et al., 2015). Universities focused on improving teacher quality and effectiveness collaborate across systems (university, school districts, and community) to provide experiences and relevant preparation for preservice teachers (Koedel et al., 2015).

An essential component of teacher preparation programs lies within the mentorship of the student teacher by the cooperating teacher (Mena, Hennissen, & Loughran, 2017). Effective mentoring programs provide support for preservice teachers beyond graduation and are mandated in Missouri for all first- and second-year teachers (MODESE, 2017). According to Sutcher et al. (2016), "Well-designed mentoring programs improve retention rates for new teachers, as well as their attitudes, feelings of efficacy, and instructional skills" (p. 5). Teachers develop a deeper understanding of knowledge and practice under the guidance of effective mentors (Mena et al., 2017). An organized mentoring program with formal training for mentors ensures preservice teachers receive effective coaching through one-on-one observations and feedback on the use of effective methods to improve student outcomes (Sutcher et al., 2016). Mentoring relationships are often seen as the most relevant and important part of the teacher preparation program (Mena et al., 2017).

Professional Development

Professional development is ongoing learning that shapes teacher beliefs, knowledge, and daily practices (Whitworth & Chiu, 2015). Patton, Parker, and Tannehill (2015) asserted, "For teachers, professional development is both an obligation and an opportunity, serving as a forum for change and for confirmation of current practice" (p. 1). School administrators are responsible for providing professional development that is relevant for teachers and encourages a shift in thinking and practice rather than just the acquisition of knowledge or skills (Patton et al., 2015). Professional development is also most effective when new learning is adjusted based on the experience of the teachers on the receiving end (Popova, Evans, Breeding, & Arancibia, 2018).

Professional development opportunities are often provided as a universal "sit and get" rather than being individualized around specific teacher needs (Patton et al., 2015). This type of professional development is ineffective and does not change teacher practice (Popova et al., 2018). Teacher learning must occur on an individualized and ongoing basis to be effective (Kennedy, 2016; Kruse, 2017; Patton et al., 2015). Effective professional development programs are comprised of the following five factors: student needs, teachers, methodology, pedagogy, and content knowledge (Popova et al., 2018). Teachers have increased ownership in professional development when they are active participants in making decisions about their learning such as what to learn, how to learn, and how to implement new learning in the classroom (Kennedy, 2016; Patton et al., 2015)

Implications for Teachers and Principals

Closing the theory-practice gap requires an environment where teachers feel safe to talk and reflect on their teaching with other educators (Hattie, 2009). Principals can have a direct impact by creating and supporting an environment where teachers have an opportunity to grow and develop (Patton et al., 2015). Effective principals evaluate teacher practices and then provide learning for teachers focused on strategies that impact student achievement (Hattie, 2015). According to Patton et al. (2015), "Professional development is too often planned and conducted based on a new teaching practice or other ideas rather than the consequences of its impact on student learning" (p. 35).

Building principals have a direct impact on the culture and environment they create in terms of what they deem important (Hattie, 2015). Principals can be divided into two types of leaders: transformational or instructional (Patton et al., 2015; Robinson, Lloyd, & Rowe, 2008). Transformational leaders are teacher-centered (Hattie, 2015). They provide teachers with a high level of autonomy, set common goals for the school, and work to create an environment that is fair and equitable for teachers (Patton et al., 2015). Instructional leaders are the opposite of transformational leaders and are student-centered (Robinson et al., 2015). They examine teacher impact on student learning and evaluate instructional effectiveness through classroom observations and aligned professional development (Darling-Hammond et al., 2009). Instructional leaders make it a priority to ensure the school has high expectations for student learning (Robinson et al., 2015).

In a study by Marks (2013), only 20% of leaders identified as instructional leaders (p. 4). According to Hattie (2017), instructional leaders have an overall effect of $d = 0.42$

in contrast to transformational leaders, who have a low effect size of $d = 0.11$ (Table 1). Principals can begin to shift toward instructional leaders by creating a culture where professional development is organized as relevant learning opportunities that move teachers from basic acquisition of knowledge to empowerment to overhaul and rethink current practice (Patton et al., 2015).

Teacher development occurs along a continuum, and training and development should be individualized so teachers can fluidly learn and improve (Hargreaves & Fullan, 2012; Patton et al., 2015). In a study by Fu and Sibert (2017), in-service elementary teachers reported a lack of theoretical background and knowledge of how theory applies to actual teaching practice. In-service teachers, therefore, relied on their intuition and experiences rather than a theoretical basis to develop lessons and impact the overall quality of instruction (Fu & Sibert, 2017). Old paradigms are established and often have a strong influence on a beginning teacher's ideas about how to teach, which can make continued growth difficult (Steins et al., 2015). Principals can prevent this ineffective practice by providing and encouraging collaborative environments where teachers develop trusting relationships with colleagues and learn from each other (Donohoo et al., 2018).

Teachers are most effective when they have decision-making power in developing their own goals for professional development and are given the support to take the steps needed to work toward their goals (Masters et al., 2015). When professional development is well-designed and purposeful, teachers are easily able to "master content, hone teaching skills, evaluate their own and their students' performance, and address changes needed in teaching and learning in their schools" (Patton et al., 2015, p. 33).

Numerous researchers have noted effective and long-term professional development is directly related to overall student success (Hattie, 2009).

The results of studies like those examined in this review support the key role of teacher-student relationships in terms of motivation to learn and student achievement (Koca, 2016). According to Hattie (2009), "Teachers using particular teaching methods, teachers with high expectations for all students, and teachers who have created positive student-teacher relationships are more likely to have the above average effects on student achievement" (p. 126). Principals can contribute to teacher effectiveness by creating a culture where teachers are expected and encouraged to collaborate and where deep levels of trust and social sensitivity are evident (Donohoo et al., 2018).

Summary

According to Ford (2018), "It is important to assess and evaluate teacher effectiveness and use of research-based practices because of the connection between teacher effectiveness and student achievement" (p. 155). Measuring the impact on student achievement allows teachers to understand which strategies are most influential in attaining student success goals (Hattie, 2009). Closing the theory-practice gap requires principals and teachers to work together to create a school environment where teachers can be self-reflective about teaching practices, identify errors as learning opportunities for better teaching, and feel safe to learn and take ownership in knowledge and understanding (Hattie, 2009; Runesson, 2015).

Educational research is not easily applied in the field due to the many variables practicing educators face on a daily basis (Horvath et al., 2016; Masters et al., 2015). Horvath et al. (2016) stated:

> Although laboratory researchers may aim to derive a universal, one size fits all definition of effective feedback, classroom practice elucidates the importance of knowing the context, the phase of learning, the intended outcomes, and other variables in order to deliver successful feedback. (p. 7)

The classroom environment is much different than the research environment, and researchers are much different than classroom teachers; therefore, creating a straightforward protocol for use in the classroom is difficult (Cooper et al., 2015).

Research such as Hattie's (2009) meta-analysis provides details about what strategies can best be used in the classroom to leverage high levels of student growth and achievement. Unfortunately, according to Masters et al. (2015), "Too often, teachers approach professional development like magpies. They pick and choose the bits that fit with their theories" (p. 6). This notion was apparent throughout the focus group interviews. Many teachers shared they do not use research-based instructional strategies with fidelity, but rather use components of the strategy that work best for them or their students. While it is important for educators to have a sense of autonomy, the most effective teachers are able to "to engage with evidence from research and from their own context and use it to break new ground and meet new challenges" (Masters et al., 2015, p. 3). This begins by helping teachers understand which strategies and influences have the greatest impact on student growth as well as how to translate these practices into the classroom on a daily basis (Masters et al., 2015).

Chapter Two included a review of the literature based on three elements of effective teaching (Hattie, 2017). A conceptual framework was developed through the lens of Hattie's (2009) meta-analysis of research-based instructional strategies with a

high, medium, and low effect size for each element of effective teaching. The chapter also included implications for principals and teachers when working to close the theory-practice gap of what research shows compared to the reality of what teachers do in the classroom (Runesson, 2015).

Chapter Three includes a description of the research design and methodology used in this study. An overview of the population and sampling methods used to determine participation is explained. The development of the instrument is described, as well as how the instrument was tested for reliability and validity. An explanation is provided for how the survey questions and focus group interview questions relate to the three research questions in the study. The methods used for data collection and analysis are expressed. Finally, ethical considerations are explained.

Chapter Three: Methodology

Chapter Three includes an examination of the research design and methodology to determine teacher knowledge and use of research-based instructional strategies that yield high effects on student achievement. The purpose of this chapter is to detail the specific processes and procedures used to collect and evaluate teacher perceptions of which strategies are most effective. The problem and purpose of the mixed-methods study, along with a review of the research questions and hypotheses, are provided. Details about the instrumentation used to collect the qualitative and quantitative data are included, as well as a thorough description of the data collection and analysis process.

A mixed-methods approach was used to investigate teacher perceptions and knowledge of research-based instructional strategies to determine if lack of knowledge is a possible cause for the theory-practice gap in education. This study resulted in relevant information to help school districts and colleges improve educator effectiveness. Improvement of educational outcomes begins with classroom teachers but is led by school administrators and must be supported by the entire school system (Masters et al., 2015). Closing the theory-practice gap continues to be a priority, because improving teachers' effectiveness in the classroom directly impacts student achievement (Ford, 2018).

Problem and Purpose Overview

The purpose of this study was to evaluate the gap between research and classroom practice by determining if teachers can accurately identify research-based instructional strategies with the highest effect size on student achievement. The gap was determined by viewing the strategies through the lens of three elements of effective teaching (Hattie,

2009; Stronge, 2018). Ford (2018) and Kinyaduka (2017) identified several theory-practice gaps in their research where educational theory was not implemented with fidelity in actual practice. Kane (2016) found a disconnect occurs because educators have difficulty translating educational research into actual classroom practice.

Research questions and hypotheses. The following research questions and hypotheses guided the study:

1. At what accuracy level are kindergarten through fifth-grade teachers able to identify research-based instructional strategies that have the highest effect size on student achievement?
2. What is the difference between the ability of new teachers (0-5 years) and veteran teachers (6+ years) to accurately identify which research-based instructional strategies have the highest effect size on student achievement?

$H2_o$: There is no significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

$H2_a$: There is a significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

3. What are the perceptions of kindergarten through fifth-grade teachers regarding research-based instructional strategies in the following areas:
    a. Frequency of use
    b. Confidence of use
    c. College training and preparation

d. Quality of professional development?

Research Design

The design for this study was a mixed-methods approach. This approach was most appropriate because of the ability to triangulate quantitative and qualitative methods to strengthen conclusions and reduce limitations (Creswell & Creswell, 2018). A mixed-methods research design provides a deeper understanding of the subject investigated and reduces validity concerns (Creswell & Creswell, 2018). In this study, teacher knowledge of research-based instructional strategies was examined. Also included in the study were teacher perceptions of confidence and frequency of using research-based instructional strategies, as well as perceptions of preparation from teacher education programs and district-provided professional development. A mixed-methods approach resulted in quantitative data from a larger sample size and qualitative data from a smaller sample size to further explain teachers' perceptions and actual practice in the classroom. Focus groups were conducted, and an online survey created by the researcher based on information gathered from the literature review was administered to triangulate data directly related to the research topic.

Quantitative. Participants were administered a survey including 18 statements describing the nine research-based instructional strategies included in the literature review. Participants were asked to complete each statement by determining if the described strategy was likely to have a high, medium, or low impact on student achievement. Each statement was worth up to two points for a total of 36 points on the entire survey. The survey was scored to provide data to show the perceptions of teachers about research-based instructional strategies and the impact on student achievement.

Qualitative. Qualitative data were collected during four focus group interviews. Teachers participating in focus groups were asked to offer perceptions about professional development received on research-based instructional strategies. Teachers were also asked to provide perceptions about how well teacher education programs prepared them to use research-based instructional strategies in the classroom. Focus group participants were asked about how frequently they utilize research-based instructional strategies in the classroom and about their confidence level in knowing which instructional strategies to use to leverage student achievement.

Population and Sample

According to Bluman (2017), the population of a study is defined as "all subjects (human or otherwise) under study" (p. 742). At the time of the study, there were 518 school districts with approximately 69,082 teachers in Missouri (MODESE, 2018, p. 1). The population of the study was narrowed to eight school districts located in southwest Missouri. School districts selected to represent the population were chosen based on similar demographics including the number of students enrolled in the districts, number of certified teachers, and free and reduced price meal status. Vicinity to the researcher was also considered. To be selected, districts had an enrollment of 500-1,000 students, fewer than 100 certified staff, a 40% or higher free and reduced price meal status, and were located no more than 60 miles from the researcher. Based on these criteria, eight school districts in southwest Missouri were selected for the study. The demographic information and names of the schools within the selected population were acquired through the Missouri Comprehensive Data System portal on the MODESE (2019) website.

Quantitative. Purposive sampling was used to select participants for the quantitative portion of the study (Creswell & Creswell, 2018). In a purposive sampling technique, participants are selected because of the specific qualities they possess (Ilker, Sulaiman, & Rukayya, 2016). The purposive sample was made up exclusively of kindergarten through fifth-grade teachers. In the selected districts, there were approximately 100 kindergarten through fifth-grade teachers (MODESE, 2019, line 3). The goal was to collect 85 kindergarten through fifth-grade teacher responses as the maximum sample size for the study. A minimum requirement of 20 responses was used as a threshold to provide enough data for analysis (Creswell & Creswell, 2018). Homogenous sampling was used since all teachers selected for the study had a shared set of characteristics (Ilker et al., 2016).

Qualitative. A random sampling method was chosen for the qualitative portion of the study (Bluman, 2017). Since all eight districts were similar in demographic makeup and size, a random sample was appropriate because data gained from the four focus groups provided accurate representation from the entire population of the eight participating districts (Creswell & Creswell, 2018). Each district was listed in alphabetical order and assigned a number to randomize the selection. A random number generator was used to select four numbers, and the districts assigned to those numbers were selected to represent the population. Once the sample was identified through random selection, the elementary principals from the four districts were asked to select six kindergarten through fifth-grade teachers to participate in the focus groups.

Instrumentation

Quantitative. A survey was developed by the researcher to evaluate whether or not teachers could accurately identify research-based instructional strategies with the greatest impact on student achievement. A four-phase design process was used to construct a quality survey instrument to reduce methodological errors (Corbin & Strauss, 2015). The first step of the development process is known as observation and includes research of the topic (Esposito, 2002). Research from the literature review and the research questions were used to develop the content of questions within the survey.

The second phase is the conceptualization phase (Esposito, 2002). The conceptual framework of the survey was designed around Hattie's (2009) meta-analysis of research-based instructional strategies and their impact on student achievement. The first three questions of the instrument were used to elicit demographic data to aid in disaggregating data for further analysis.

The second section of the instrument included 18 statements describing research-based instructional strategies included in this study. Two descriptive statements were provided for each of the nine strategies. Participants determined if the strategy described within the statement typically yields a high, medium, or low impact on student achievement in the areas of teacher attributes, curricula, and teaching strategies.

Participants could score a total of two to 36 points on section two of the survey. For each statement, a participant was able to earn two points for correctly identifying the impact level of the strategy described. Participants earned one point if the response selected was one level from the correct answer (e.g., correct answer was high, but participant selected medium), and participants earned zero points if the response was two

levels from the correct answer (e.g., correct answer was high, but participant selected low).

The third phase is known as the operationalization phase (Esposito, 2002). This includes the structure, organization, and appearance of the survey (Corbin & Strauss, 2015). The survey was organized to include a demographic section as well as an instructional strategies section. The demographic section was necessary to aid in disaggregating the data to answer research questions one and two. The second section of the instrument, identified as the instructional strategies section, included 18 statements describing the nine targeted instructional strategies. This section of the instrument served as an assessment to collect quantitative data to determine teachers' perceptions of the impact of each instructional strategy on student achievement (Corbin & Strauss, 2015).

The final phase of the development of a survey is administration (Esposito, 2002). Once the survey was developed, it was field-tested by educators not participating in the study. During the field-testing process, questions were tested for reliability and validity (Corbin & Strauss, 2015). Once the questions were reviewed and revised, the instrument design process was complete and ready for the study. The survey (see Appendix A) and data collected were housed in *Qualtrics*.

Qualitative. Focus group responses were utilized to answer the third research question. An interview protocol refinement framework was used to develop questions for focus group interviews (Castillo-Montoya, 2016). The interview protocol refinement framework consisted of four phases and was used to ensure the reliability and quality of data obtained through focus group interviews (Castillo-Montoya, 2016). The first phase was ensuring the interview questions aligned with the research questions (Brinkmann &

Kvale, 2015). The focus group interview questions were written to answer research question three of the study. Information collected included teacher perceptions of the following: college training and preparation, quality of professional development, frequency of strategy use, and confidence of use of research-based instructional strategies. Seven questions were developed using research from Chapter Two to align with the four subcomponents of research question three.

The second phase of the framework was constructing an inquiry-based conversation (Castillo-Montoya, 2016). Questions developed for the focus groups were written as key questions and were open-ended so participants could fully explain and expand on answers (Brinkmann & Kvale, 2015). The constructed response questions were written with neutral wording to prevent assumptions of answers to research question three.

The third phase was collecting feedback on the focus group questions (Castillo-Montoya, 2016). The purpose of this phase was to enhance the reliability of the survey. Educators not participating in the study field-tested the questions and provided feedback on improving the questions to ensure clarity, specificity, and answerability (Brinkmann & Kvale, 2015). Similarities or differences in response distribution from the seven questions provided insight into how the wording of the questions could be improved (Castillo-Montoya, 2016). Cognitive interviewing with the participants after the field test provided information about how well participants understood the interview questions and if their understanding matched the intent of the questions (Patton, 2015).

The fourth phase was piloting the interview protocol (Castillo-Montoya, 2016). A pilot focus group comprised of educators not participating in the study was used to test

final questions for reliability and validity as well as the overall length of time for the focus group interviews. This process was completed with a group of six educators who were similar to participants of the sample of the study. The purpose of this phase was to create an environment to simulate the actual interview in conditions identical to the focus groups and to make final adjustments before the focus group interviews (Patton, 2015).

After completion of all four phases, focus group discussion questions were finalized and ready for data collection (see Appendix B). The groups were formed from the four school districts randomly selected from the population. One focus group was created for each of the four districts and included six participants. Focus groups were utilized to gather data on teacher perceptions of the professional development provided by their school districts as well as preservice training received from their teacher education programs. Participants' overall knowledge and confidence in using research-based instructional strategies that yield the highest effect on student achievement was also revealed. Participants were asked about the frequency with which research-based instructional strategies are utilized in the classroom. All interviews were audio recorded for transcribing.

Validity

Quantitative. According to Creswell and Creswell (2018), "Validity in quantitative research is whether you can draw meaningful and useful inferences from scores on the instruments" (p. 153). The survey instrument developed and used in this study was field-tested by 20 kindergarten through fifth-grade teachers not participating in the study using the Validation Rubric for Expert Panel (VREP) to determine validity (Simon & White, 2016). The VREP measured face validity, construct validity, and

content validity through 11 criteria to determine if any modifications to the instrument were needed prior to being used for data collection (Simon & White, 2016).

The instrument was used to elicit teachers' perceptions of which research-based instructional strategies have the highest impact on student achievement. After the survey was field-tested and checked using the VREP, revisions to the survey were made to ensure questions were valid (Heale & Twycross, 2015; Simon & White, 2016). After establishing validity with the VREP, the instrument was deemed an effective tool to use in the research (Creswell & Creswell, 2018).

Qualitative. All interview questions were field-tested by six kindergarten through fifth-grade teachers (one from each grade level) who did not participate in the study. To establish a reasonable level of validity with focus groups, respondent validation, or member checking, was used (Birt, Scott, Cavers, Campbell, & Walter, 2016; Creswell & Creswell, 2018). After the responses from the focus groups were transcribed, the information was sent back to principals and distributed to participants for review to ensure ideas and comments were accurately captured. This technique improved the validity, credibility, and accuracy of the study (Creswell & Creswell, 2018).

Reliability

Quantitative. According to Creswell and Creswell (2018), "Reliability refers to the consistency or repeatability of an instrument" (p. 154). Utilizing the conceptual framework, research questions, and information gathered for the literature review, explicit questions were written to create a reliable tool to determine whether or not teachers could accurately identify the impact levels of research-based instructional strategies on student achievement. Internal consistency was used as a measure to

establish a high level of reliability (Heale & Twycross, 2015). To check internal consistency of the survey questions, average inter-item correlation was calculated (Trochim, 2018).

The survey consisted of two similar statements for each of the nine research-based instructional strategies. , The correlation was calculated between the pairs of statements from the responses on the field test to test the average inter-item correlation (Trochim, 2018). The mean of all the correlations was calculated to determine if the statements fell within a 0.15-0.50 average inter-item correlation range (Trochim, 2018, para. 5). This range indicates a high level of reliability (Trochim, 2018). A second measure for the reliability of the survey was through test-retest correlation to measure results for consistency in participants' responses after taking the survey two times (Creswell & Creswell, 2018; Heale & Twycross, 2015). Participants in the field test were asked to take the survey twice, and responses were matched to check for similar responses between both tests.

Qualitative. The questions developed by the researcher were guided by the conceptual framework and the review of literature to ensure repeatability of the focus group discussions. Questions were field-tested by six educators not participating in the study. The feedback received from the field tests was noted, and interview questions were revised as needed. A script was written, including all seven discussion questions to ensure repeatability between focus groups (see Appendix C) (Heale & Twycross, 2015). Each focus group also received a list of definitions for the three high-impact research-based instructional strategies focused on in the study to ensure a common understanding of terms before the focus group discussions.

Methodological triangulation was used in this study, as data were collected through multiple methods, including teacher surveys and four focus groups (Creswell & Creswell, 2018). Research was included from current literature regarding the theory-practice gap and teacher perceptions of effective research-based instructional strategies. Methodological triangulation increased validity and reliability and provided confirmation of findings and a deeper understanding of the subject through data that were more comprehensive (Creswell & Creswell, 2018).

Data Collection

Quantitative. Names and email addresses of the superintendents from the eight selected school districts were collected through the Missouri School Directory located on the MODESE (2019) website. A phone call was made to superintendents requesting permission to participate in the survey. An email containing the informed consent and survey link was also emailed to the superintendents (see Appendix D). After permission was granted, names and emails of building principals were collected from the superintendents of the selected districts.

Upon approval of the Lindenwood Institutional Review Board (see Appendix E), invitation letters were emailed to building principals to forward to kindergarten through fifth-grade teachers in their buildings (see Appendix F). The invitation letter forwarded to teachers included a copy of the informed consent and a link to the survey. The data collection window was open for 14 days.

Qualitative. Once the four schools were identified for participation in the focus group discussions through random selection, permission was requested from each selected district's superintendent (see Appendix G). Upon approval from each

superintendent, building principals were contacted via phone and asked to select six kindergarten through fifth-grade teachers to be interviewed in the focus groups. A copy of the approval letter and recruitment letter were sent to the principals to forward to participants (see Appendix H). A date and time were scheduled and communicated to participants through each building principal for the focus group discussions. Copies of the focus group definitions of key terms and questions, along with consent forms for each participant (see Appendices H & I), were forwarded to the building principals to share with participants prior to the focus group interview.

The participant answers from the focus groups were recorded using an audio-recording device. A script was followed by the moderator to ensure reliability among the focus groups. Each participant was identified through a number/letter system to assure confidentiality. For example, participant number one from school number one was identified as participant 1A. To avoid confusion with the audio recording, the researcher gave each participant an index card with a number/letter. As the interview began, participants stated their number/letter prior to answering the focus group questions. Once transcriptions from the focus groups were complete, copies were emailed back to principals to be shared with the focus group participants to review for accuracy of statements.

Data Analysis

Quantitative. After the survey collection, data were analyzed to answer each of the first two research questions. For research question one, section two of the survey was scored with the answer key and point values shown in Table 1. Participants could score a range of two to 36 points on section two of the survey.

Table 1

Survey Questions – Answer Key and Response Values

Question	Response	Point Value	Response	Point Value	Response	Point Value
1	Low	2	Medium	1	High	0
2	Low	0	Medium	1	High	2
3	Low	1	Medium	2	High	1
4	Low	2	Medium	1	High	0
5	Low	1	Medium	2	High	1
6	Low	0	Medium	1	High	2
7	Low	2	Medium	1	High	0
8	Low	0	Medium	1	High	2
9	Low	1	Medium	2	High	1
10	Low	2	Medium	1	High	0
11	Low	0	Medium	1	High	2
12	Low	1	Medium	2	High	1
13	Low	0	Medium	1	High	2
14	Low	1	Medium	2	High	1
15	Low	2	Medium	1	High	0
16	Low	0	Medium	1	High	2
17	Low	1	Medium	2	High	1
18	Low	2	Medium	1	High	0

Descriptive statistics were used to analyze the results of the participants' knowledge of the impact of instructional strategies on student achievement. Results from the survey were analyzed based upon demographic factors such as teacher grade level and years of experience to describe overall differences or similarities in scores. Scores from each of the three essential elements including teacher attributes, curricula, and

teaching strategies were also described for the purpose of determining if participants scored higher in one element compared to another.

Pearson's Index of Skewness was used to determine the distribution of data (Bluman, 2017). All data, including outliers, were included with the assumption participants answered the questions honestly. The data collected for research question one showed how accurately teachers were able to identify the instructional strategies that have the highest impact on student achievement.

Data collected to answer research question two revealed the difference between new teachers' and veteran teachers' knowledge of identifying research-based instructional strategies with the highest effect on student achievement. For research question two, a two-tailed *t*-test was used to determine the difference between the mean responses of new teachers and veteran teachers (Bluman, 2017). The results of the *t*-test indicated if the null hypothesis should be rejected or not rejected (Bluman, 2017). The data collected for research question two revealed if there was a significant difference between the scores of new teachers and those of veteran teachers as well as which group of teachers could better identify the instructional strategies with the greatest impact on student achievement.

Qualitative. Once the focus group interviews were complete, the audio recordings were transcribed. Open coding was used as a transitional process between data collection and more extensive data analysis of the written transcriptions (Saldaña, 2015). Open coding was used to identify concepts from raw data and to merge the data into themes (Saldaña, 2015). Once the open coding process was completed, axial coding was used to identify relationships and themes among the open codes (Allen, 2017;

Creswell & Creswell, 2018). Axial coding allows for the identification of connections among data and involves comparing emergent themes within the data set to make claims regarding teachers' perceptions of research-based instructional strategies (Allen, 2017).

Questions were asked in every focus group to elicit teachers' perceptions of the frequency with which they used research-based instructional strategies in the classroom and their confidence level when utilizing those strategies. Focus group participants were also asked about their perceptions of the professional development received within their school districts and the college training and preparation they received on research-based instructional strategies. The responses from these questions were used to answer research question three.

Ethical Considerations

Safeguards were established to ensure participants in the study were protected (Creswell & Creswell, 2018). Survey participants were not asked to reveal any identifying information including names or district affiliation. Email addresses were not collected from any participants, keeping all responses anonymous (Fraenkel, Wallen, & Hyun, 2015). To maintain confidentiality, survey results were stored through *Qualtrics* during the data collection process (Creswell & Creswell, 2018). The information stored through *Qualtrics* was protected with a confidential username and password known only to the researcher.

Safeguards were also established for focus group participants. Teachers participating in a focus group were not asked to reveal any identifying information to maintain anonymity (Creswell & Creswell, 2018). Email addresses and contact information were not collected, and all communication occurred with the building

principals to protect the identities of teacher participants. Once focus groups were completed, all audio recordings and transcripts were securely stored to maintain confidentiality. All documents and files will be destroyed three years from the completion date of the research project.

Participants in the survey and focus groups were provided a consent document through email. The consent documents contained information pertaining to the purpose of the study, protections, confidentiality, and anonymity for the participants in the study (Creswell & Creswell, 2018). Specifically, the consent documents provided assurance there were no anticipated risks associated with this research as well as no direct benefits for participating in the study. Participation was voluntary, and participants could choose not to answer any questions or to withdraw from the study without being penalized (Fraenkel et al., 2015). Consent from the participant was considered signed and accepted if the participant completed the survey or participated in the focus group.

Summary

Chapter Three included a review of the problem and purpose of the study to analyze teachers' knowledge of which research-based instructional strategies yield the greatest impact on student achievement. The survey was designed to measure teacher accuracy when identifying the impact level of research-based instructional strategies. The interview questions were created to investigate teacher perceptions of college preparation and district-provided professional development on research-based instructional strategies as well as teacher confidence using research-based strategies in their classrooms. The research questions were clearly articulated, and the research design was identified as a mixed-methods study.

The sample for this study was narrowed to eight school districts in southwest Missouri. All kindergarten through fifth-grade teachers in the sample school districts were invited to participate in the quantitative portion of the study. Four school districts from the sample were identified through a random selection process to participate in the focus groups. Six kindergarten through fifth-grade teachers from each of the four school districts participated in focus group interviews for the qualitative portion of the study.

The quantitative instrument used for this study was an online survey consisting of 18 questions about research-based instructional strategies. The survey was field-tested by educators not participating in the study. The qualitative instrument used for this study was a set of interview questions written by the researcher to be used for focus group interviews. The interview questions were also field-tested by educators not participating in this study. The questions were used to interview kindergarten through fifth-grade teachers in four sample school districts.

Within Chapter Three, the data collection process through teacher surveys and focus group interviews was described. The analysis of collected data was discussed, including transcriptions, coding, and organization of data into themes. Ethical considerations and reassurances for the participants were explained.

Chapter Four contains an analysis of the data collected through the surveys and focus groups. Teacher perceptions and accuracy of identifying research-based instructional strategies are presented in tables and graphs. Trends revealed from the responses of the focus groups about professional development, educator program development, and frequency and confidence of use are discussed, as well as teacher perceptions on preparation and knowledge of research-based instructional strategies. The

data from the focus group interviews were analyzed, and four themes emerged from the data.

Chapter Four: Analysis of Data

The purpose of this study was to identify why there is a gap between educational research and classroom practice. To do this, teacher knowledge of research-based instructional strategies was determined based upon survey responses. Teacher perceptions of professional development and preparation from teacher education programs with regard to effective research-based instructional strategies were investigated. Finally, teacher perceptions concerning confidence in using research-based instructional strategies and the frequency with which strategies are used in the classroom were also revealed.

This research was completed through a mixed-methodology study. A mixed-methods approach was used, because "both qualitative and quantitative research, in combination, provides a better understanding of a research problem or issue than either research approach alone" (Bulsara, 2015, p. 6). A mixed-methods approach provided concrete data to measure teachers' accuracy of identifying research-based instructional strategies in addition to interview data about teacher perceptions and actual classroom practice.

Quantitative and qualitative data allowed for a triangulation of data to thoroughly answer research questions within the study. The quantitative data were collected through an online survey to assess teachers' accuracy in identifying the impact level of research-based instructional strategies. The qualitative data were collected through four focus groups of six kindergarten through fifth-grade teachers in each of four rural school districts located in southwest Missouri.

The focus groups were interviewed, and responses were recorded on a digital recorder. After the focus groups were completed, recordings from the interviews were transcribed. Open coding was used to label reoccurring words and phrases found in the transcripts multiple times by making notes, underlining significant words, and circling full thoughts (Allen, 2017). Once the open coding was complete, the data were sorted using axial coding to organize data from the transcripts into four themes.

The instrument used was designed as a tool to assess teachers' accuracy in identifying the strategies that yield the highest impact on student achievement. The survey included 18 questions describing research-based instructional strategies with high, medium, and low levels of impact on student achievement. The survey was given to teachers from kindergarten through fifth grade from eight different school districts in southwest Missouri. The survey was designed to address the following research questions:

1. At what accuracy level are kindergarten through fifth-grade teachers able to identify research-based instructional strategies that have the highest effect size on student achievement?
2. What is the difference between the ability of new teachers (0-5 years) and veteran teachers (6+ years) to accurately identify which research-based instructional strategies have the highest effect size on student achievement?

$H2_o$: There is no significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

$H2_a$: There is a significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the highest effect size on student achievement.

Demographic Data for Survey

The recruitment letter (see Appendix E) and survey link were sent electronically to 100 kindergarten through fifth-grade teachers in eight school districts in southwest Missouri. Of the 100 requests for voluntary participation, 60% (n = 60) of the invited educators completed the online survey. The demographic data were reported by the survey respondents and are compiled in Table 2. All grade levels were well-represented in the survey.

Table 2

Participants' Grade Levels Taught by Percentage

Grade Levels Taught	*n*	Percentage
Kindergarten	11	18.33
First Grade	7	11.67
Second Grade	11	18.33
Third Grade	10	16.66
Fourth Grade	8	13.33
Fifth Grade	12	20.00
Unknown	1	.01

The second demographic category, years of experience, was divided into four groups (see Figure 1). Participants in the study ranged from first-year teachers to

educators with more than 21 years of experience.

Figure 1. Number of years participants have been working in the field of education.

The final question in the demographic section was about teacher familiarity with research-based instructional strategies. The question was based on a four-point Likert-type scale with responses ranging from very familiar to not familiar. Overall, 34.3% (*n* = 21) reported being very familiar with research-based instructional strategies, and 47.54% (*n* = 29) reported being moderately familiar with research-based instructional strategies. The data showed all participants were at least slightly familiar, and 81.84% (*n* = 50) of participants were either moderately familiar or very familiar with research-based instructional strategies (see Figure 2).

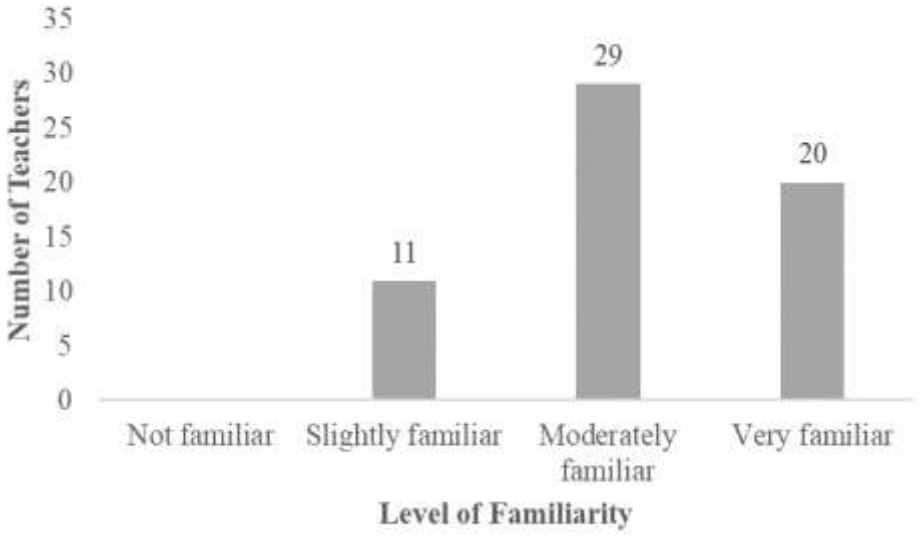

Figure 2. Teachers' familiarity with research-based instructional strategies.

Analysis of Survey Data

The results of the survey completed by kindergarten through fifth-grade teachers were examined through total responses received as well as through new and veteran teacher designations. A total of 60 teacher responses were obtained. The second section of the survey included three categories with six statements, each describing research-based instructional strategies. Participants were asked to determine if each described strategy typically yields a high, medium, or low impact on student achievement. Each statement was worth up to two points, and overall, participants could score up to 36 points on the second section of the survey. Participants had to correctly answer both questions describing the strategy to be considered accurate.

Category one included statements describing three research-based instructional strategies within the category of teacher attributes. Collective teacher efficacy was the strategy used in the study with the highest impact on student achievement. Of the 60 respondents, 81.67% (n = 49) correctly identified this strategy as the high-impact strategy

for the teacher attribute section. Teacher-student relationships were the research-based instructional strategy identified as having a medium impact on student achievement. Of the 60 respondents, none correctly identified this strategy as a medium-impact strategy. Teacher subject-matter knowledge was the strategy identified as having a low impact on student achievement. Of the 60 respondents, none correctly identified this strategy as a low-impact strategy. Teachers were not able to differentiate the high-impact strategy from the medium- or low-impact strategies. The mean score of respondents for the teacher attributes category was $M = 6.11$. Overall, no respondents scored all 12 points possible in this section by correctly identifying the impact levels of the three research-based instructional strategies for this category (see Table 3).

Table 3

Participants' Scores for Teacher Attributes Section

Total Score	*n*	Percentage
2 points	0	0
3 points	1	1.67
4 points	2	3.33
5 points	5	8.33
6 points	39	65.00
7 points	7	11.67
8 points	6	10.00
9 points	0	0
10 points	0	0
11 points	0	0
12 points	0	0

The second category included statements describing three research-based instructional strategies related to curricula. Conceptual change program was the strategy used in the study with the highest impact on student achievement. Of the 60 respondents, 75% (n = 45) correctly identified this strategy as the high-impact strategy for the teacher attribute section. The medium-level strategy for this section was the integrated curriculum strategy, and only 1.67% (n = 1) of respondents correctly identified this strategy as a medium-level strategy. The curricula strategy for teaching reading, known as the whole-language approach, was the low-impact strategy for the curricula section. Only 3.33% (n = 2) of respondents correctly identified this strategy as having the least impact on student achievement. Within the survey, teachers were not able to differentiate the high-impact strategy from the medium- or low-impact strategies. The mean score of respondents for the curricula section was M = 7.21. Overall, no respondents scored all 12 points possible in this section by correctly identifying the impact level of the three research-based instructional strategies for this category (see Table 4).

Table 4

Participants' Scores for Curricula Section

Total Score	*n*	Percentage
2 points	0	0
3 points	0	0
4 points	0	0
5 points	3	5
6 points	17	28.33
7 points	16	26.66
8 points	13	21.67
9 points	10	16.67
10 points	1	1.67
11 points	0	0
12 points	0	0

Category three included statements describing three research-based instructional strategies related to teaching strategies. Jigsaw method was the teaching strategy used in the study with the highest impact on student achievement. Of the 60 respondents, 40% (n = 24) correctly identified this strategy as the high-impact strategy for the teacher attribute section. Cooperative learning was the instructional strategy identified as having a medium impact, and 21.67% (n = 13) of respondents correctly identified this strategy as the medium-level strategy. The low-impact strategy in the teaching strategies section was problem-based learning. Zero respondents correctly identified this strategy as having a low impact on student achievement. The mean score of respondents for the curricula

section was $M = 6.31$. Overall, no respondents scored all 12 points possible in this section (see Table 5).

Table 5

Participants' Scores for Teaching Strategies Section

Total Score	*n*	Percentage
2 points	0	0
3 points	0	0
4 points	1	1.67
5 points	10	16.67
6 points	27	45
7 points	15	23.33
8 points	5	8.33
9 points	2	3.33
10 points	0	0
11 points	0	0
12 points	0	0

Figure 3 shows the accuracy of teachers in identifying the impact level of research-based instructional strategies. Overall, no respondents scored all 36 points possible. Zero respondents scored 29-35 points, 36.67% ($n = 22$) scored 21-28 points, and 63.33% ($n = 38$) scored 2-20 points. Within the survey, teachers were inaccurate in identifying the impact level of research-based instructional strategies.

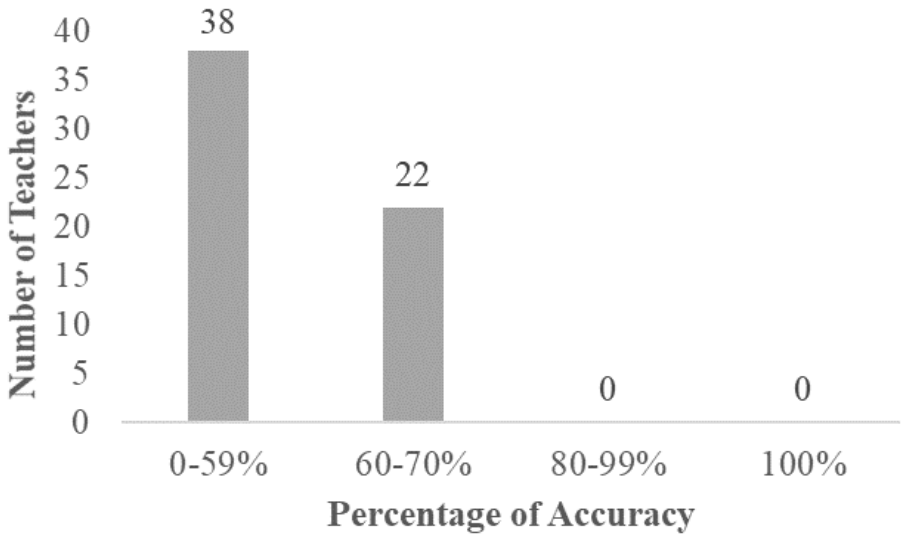

Figure 3. Percentage of accuracy of teachers in identifying the impact level of research-based instructional strategies.

The total scores from all participants were statistically measured using Pearson's first coefficient of skewness to determine the distribution of the data (Bluman, 2017). Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean (Bluman, 2017). The mean of the data was $M = 19.7174$, and the mode was 20. The standard deviation was $SD = 1.86$ with a coefficient of skewness of -0.456. It was determined the data were approximately symmetric, since the skewness was between -0.5 and 0.5 (Bluman, 2017, p. 299).

To answer research question number two, participant responses were disaggregated by new teachers with 0-5 years of experience and veteran teachers with six or more years of experience to determine if veteran teachers could identify high-impact research-based instructional strategies with greater accuracy than new teachers. Participant scores were calculated from all three categories, and a two tailed *t*-test was conducted to reject or fail to reject the null hypothesis. The *p*-value of the two-tailed *t*-

test was $p = 0.62$. Since the p-value was greater than the significance level of $p = 0.05$, there was not enough evidence to conclude the difference between the population means was statistically significant; therefore, the null hypothesis was not rejected (Bluman, 2017, p. 417). There was no significant difference between the ability of new teachers and veteran teachers to accurately identify which research-based instructional strategies have the greatest effect on student achievement. Overall, both groups were inaccurate in identifying the impact levels of research-based instructional strategies.

Demographic Data for Focus Groups

To investigate the perceptions of teachers with regard to teacher education programs, district-provided professional development, frequency of strategy use, and confidence of strategy use, focus group interviews were conducted to address the third research question of the study:

3. What are the perceptions of kindergarten through fifth-grade teachers regarding research-based instructional strategies in the following areas:
    a. Frequency of use
    b. Confidence of use
    c. College training and preparation
    d. Quality of professional development?

Four focus groups were conducted in four rural school districts in southwest Missouri. Each focus group was comprised of a kindergarten, first-grade, second-grade, third-grade, fourth-grade, and fifth-grade teacher. Participants had varied years of teaching experience.

Participants were asked seven questions regarding perceptions of teacher preparation programs, of district-provided professional development, and of research-based instructional strategies. Participants were asked about their confidence using research-based instructional strategies as well as the frequency with which they use strategies in the classroom. Interviews with each focus group lasted approximately 30 minutes. Participants were asked how many years they had been in education. A majority of participants in the study had been in the field of education more than five years. Only five of the 24 participants were considered new teachers with zero to five years of experience. Figure 4 shows focus group participants' years of experience.

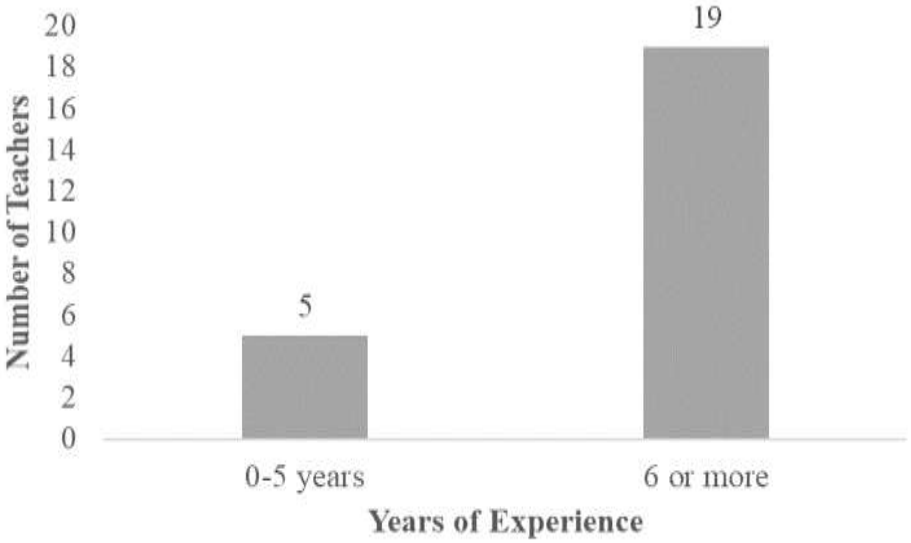

Figure 4. Participants' years of experience in the field of education.

The focus groups were interviewed, and their responses were recorded on a digital recorder. To maintain anonymity, each participant was assigned an identification code to use during the interview. After the focus groups were completed, the recordings were transcribed. The written transcriptions were then coded using open coding, which was

completed by labeling words and phrases found in the transcripts multiple times by making notes, underlining words, and circling thoughts (Allen, 2017). Open coding was completed for each of the subcategories of research question number three. Responses correlated to research identified in the literature review were also highlighted and coded. Once the open coding was complete, the data were sorted using axial coding to determine themes. The initial themes were then narrowed down to summarize common themes from all four focus groups.

Theme One: Frequency of Use in Classroom

Participants from all four focus groups answered with a variety of responses when asked about the frequency with which research-based instructional strategies were used in the classroom. Some teachers reported using them daily, while others reported not using the strategies as much as they would like because of the extra time required to teach the use of the strategy to students. Teacher B5 stated:

> I would like to use them more, but it seems like the time you spend on implementing some of those research-based strategies, you end up spending three or four days on a concept versus one day that you just hit it and go.

Several teachers reported a lack of time and the large number of required concepts or standards as reasons for not spending more time using research-based instructional strategies.

Teachers also reported only using a few research-based strategies and not the majority of what they have learned because those few strategies were what they felt most comfortable using, and students have responded well to those strategies. Teacher B2 reported, “I think I feel most comfortable, and my kids know it, and I don’t have to

reteach it constantly." Many teachers also shared the need to be flexible and to recognize when strategies do not work for students or classes. According to Teacher B4, "You have to pick and choose with your group. Some class dynamics are such that you cannot do a lot of those activities you want to."

When asked about their use of the high-impact jigsaw method, almost all teachers in the focus groups reported using a modified version of the strategy where students teach struggling peers but do not work in cooperative learning "home" groups as the strategy is described. Teachers reported time as a factor for not using the strategy as intended. Teacher B4 stated, "My students really enjoy that type of thing, and they probably do learn more from that, but it is a time-consuming strategy." Another teacher in the focus group, Teacher B6, agreed:

> It's just it [jigsaw method] would take so long to teach them how to do it and then to verify that their information was correct and bringing it back to their peers would be overwhelming. The jigsaw would take a lot of planning, a lot of training, and a lot of prayer.

Teachers who reported benefits of the jigsaw method agreed the strategy boosted student self-confidence and student engagement. Teachers asserted students responded more when learning from their peers than from the teacher.

Focus group participants were asked about their use of the high-impact conceptual change program, and almost all teachers reported using portions of the strategy to help build upon background knowledge when introducing new concepts. Teachers reported using a variety of graphic organizers and anchor charts to help students visualize prior knowledge and misconceptions. One focus group specifically talked about the training

received called the Missouri Reading Initiative (MRI). Teachers were taught a specific strategy called Reading and Analyzing Nonfiction. This literacy-based strategy aligns directly with conceptual change program, as teachers address students' misconceptions prior to teaching new content. All teachers from that focus group reported using this strategy frequently and seeing success with all students in kindergarten through fifth grade. Teachers from that particular focus group also reported using the conceptual change strategy in all content areas at different times.

When asked about the high-impact teacher attribute strategy, collective teacher efficacy, teachers summarized collective teacher efficacy as working together to meet students' needs and doing whatever it takes to help students succeed. Several teachers reported the importance of all staff supporting this culture, not just classroom teachers. Teacher B4 stated:

> I think it goes even farther in our little setting than just teachers because our school secretary, she is so warm with the students and she also serves as our nurse, and our cooks… It's just a lot of one-on-one attention they [students] get. And it goes beyond academics. I think it just really strengthens the students.

A teacher in another focus group, Teacher A2, responded, "I feel like the teachers here in our school go out of their way to make sure every child can succeed to the best of their ability." Teachers agreed collective teacher efficacy is about supporting the whole child, not just academics.

Regarding collective teacher efficacy, focus group participants also described teacher support for one another as an essential component. Teacher C2 specified, "You might have a bad day, but the collective teacher mentality will help you get through it."

Teacher encouragement and support was a reoccurring theme among all four focus groups when discussing collective teacher efficacy in their schools.

Theme Two: Confidence of Using Research-Based Strategies

Focus group participants were asked about how confident they felt in knowing and using the research-based instructional strategies that yield the highest impact on student achievement. A majority of teachers in the focus groups reported feeling confident in their teaching, but not confident in recognizing and using specific strategies or the impact of the strategies on student achievement. Teachers reported using strategies they learned, but not knowing what they were specifically called. Teacher C2 shared:

> If, like, my principal's coming and saying what research-based strategy are you using? I would be like, I have no clue. But I know that I've learned it at some point. So, I feel confident in my teaching, but actually knowing what strategy I'm using, I don't always necessarily feel confident about that.

Teacher A5 stated, "I probably couldn't name a lot, but I feel pretty confident in knowing several that I could apply in my classroom." Teachers in all focus groups reported the same thoughts about knowing strategies to use in the classroom, but not knowing the names of the strategies.

Teachers also reported low confidence in knowing the impact of instructional strategies on student achievement. Teachers in one focus group talked about not having objective assessments to provide concrete data about student growth and achievement. One teacher in particular stated, "And so I sometimes struggle with knowing. I feel like what I'm doing is what I think I'm supposed to be doing. But is it really effective? Is it getting the growth we need?" When talking about the many strategies she uses in the

classroom, Teacher B5 indicated, “I always question what made the biggest impact on my kids.” Teachers were unsure what impact the strategies used had on student achievement because they did not have a clear and direct way to measure student achievement.

Teachers reported using multiple strategies and differentiating based on class dynamics and student needs. Teacher B4 explained, “Every year is a different year, so you have to try and learn from the kids what works best.” Teachers stated what worked well for one class might not work as well for the next class. Flexibility and willingness to use different strategies was important to teachers. Teacher C6 stated, “You change for each class that you have, and you just have to get in and pull from experience and pull out which ever research-based strategy works for that group, whatever you’re teaching.” Another teacher talked about how her math workshop looked different than another teacher’s. She spoke about the importance of autonomy in teaching and having the flexibility to use research-based strategies and the individual teacher’s knowledge to do what was best for the students in the class.

Teachers felt more confident implementing strategies when they received ongoing training. Teachers in one focus group shared about the training they received from the MRI on guided reading strategies and how the training improved their confidence in teaching. Teacher C3 shared:

> I didn’t know if this was going to be something I could do at first, but as we’ve gotten into it and as I’ve put it into use, it’s really helped my classroom and I feel pretty confident in that as well.

Other teachers in the same focus group agreed with the impact of the MRI training on student outcomes in the classroom.

Theme Three: District-Provided Professional Development and Training

School districts do not provide specific training on research-based instructional strategies. Teachers in all focus groups reported a lack of district-provided training on strategies to improve their teaching. Teacher A1 stated, "Our professional development in research-based strategies has kind of fell [sic] to the wayside compared to other things." Teachers reported that any focus on research-based instructional strategies was provided at only a surface level at best. Teachers shared frustration with many initiatives being started at the district level and little follow through long-term.

Training provided by districts was often focused on implementing curriculum or resources rather than on research-based instructional strategies. Several teachers stated they received better training by going to conferences or outsourced training. Teacher A3 specified, "I've gone out to trainings and received more at outside facilities than bringing people here and doing trainings, because it's more what you needed, and you could specialize in what your interests are." Teachers reported most of their training received from the district was outsourced through conferences. When asked about the types of training provided by their districts, all teachers in the focus groups reported either generalized training in technology, special education, or purchased instructional resources. Based on data from the focus group interviews, school districts do not provide specific training on research-based instructional strategies.

Teachers reported district-wide training for all staff was effective because all teachers are expected to teach similarly, which provides consistency for students. One

specific focus group discussed district-wide training received from the MRI and the expectation for all staff to implement the research-based instructional strategies from the program. One teacher specifically stated, "The training we've received through MRI has really helped me with guided reading." The expectation was set by the principal and superintendent that all staff would receive the training and were required to use the strategies in the classroom daily. According to the teachers, the transition and initial implementation were difficult, but by the end of the first year teachers were supportive of the initiative because of the ongoing training received throughout the school year.

Theme Four: College Preparation and Training for New Teachers

Teachers had a variety of feelings about how their college training prepared them to implement research-based instructional strategies. Some teachers felt very prepared, while others could not remember or did not feel prepared at all. Teacher A2 stated:

> I feel that my educator program really did a good job on making sure that we had a thorough knowledge of several different research-based instructional strategies. Not only that, but they also taught us how to use them.

Teacher C3 admitted, "It wasn't as long ago for me, but I still can't remember a whole lot." These responses were similar among all four focus groups.

Teachers reported their master's programs were more effective in teaching them research-based practices than were their undergraduate programs. Teacher C1 detailed, "I'm also going through my master's right now, and we're really focusing on brain-based research strategies for instruction to increase retention and things like that, so implementing those in my classroom is helpful." Another teacher explained she retained

more from her master's program because she had taught for a few years and had experiences from which to draw.

One participant attended a teachers college in the United Kingdom and had a unique perspective to share about teacher preparation. The teacher attended a Research-Based Instructional Strategies College under Ken Robinson. He said he felt very prepared as he entered the classroom because he learned specifically about research-based instructional strategies and how to apply them in teaching. During his practicums, he observed and was given feedback specifically on his use of research-based instructional strategies. This teacher's account of college training and preparation was much different from any other focus group participant because his training was explicitly tied to preparation in research-based instructional strategies.

Themes from the qualitative portion of the study provided depth and understanding of teachers' experiences and overall knowledge of research-based instructional strategies. Each teacher provided a unique perspective and insight into preparation and training in research-based instructional strategies. Teachers in all focus groups shared similar feelings about an overall lack of preparation and low confidence in knowing the impact of research-based instructional strategies on student achievement. Teachers shared a common feeling of wanting systematic and in-depth training for all staff on how to apply strategies for all grade levels and content areas.

Summary

In this chapter, the results of the survey and teacher focus groups were revealed. A mixed-methods approach was used to triangulate quantitative and qualitative data to answer the research questions within the study. The data from the survey showed

teachers were not able to accurately and consistently differentiate the impact levels of research-based instructional strategies. The data gathered from the focus group interviews showed teachers had mixed feelings about their knowledge and confidence in selecting and teaching the research-based instructional strategies that yield high effects on student achievement.

In Chapter Five, a summary of the overall study is presented. The findings from the data are explained, and the perceptions of the teachers are discussed. The conclusions allowed the researcher to answer the research questions with support from the teacher surveys and focus group interviews. The conclusions were supported by the findings of the literature review. Implications for practice and suggestions from the researcher for future case studies are explained. Finally, recommendations for future research were determined and are reviewed in Chapter Five.

Chapter Five: Summary and Conclusions

The intent of this mixed-methods study was to identify teacher knowledge and perceptions of research-based instructional strategies as a possible cause of the theory-practice gap in education. The study was conducted to determine how accurately teachers could identify the research-based instructional strategies that yield the highest impact on student achievement. The study was also conducted to investigate teacher perceptions of the actual use of research-based instructional strategies in the classroom. Teachers reported feeling confident in their teaching abilities but were not able to identify the impact level of research-based instructional strategies on student achievement.

According to Harbour et al. (2015), "What teachers do and how students perform intersect, making teachers a critical factor for determining student success. When teachers use effective practices, they maximize the probability students will be actively engaged in instruction" (p. 5). Throughout the course of this study, information was gathered about possible reasons for why a gap exists between educational research and actual classroom practice. Educational research reveals explicit information about what practices are most effective in promoting student achievement (Hattie, 2009). Teachers use their individual experiences and knowledge to deliver instruction in the most effective way they know (Steins et al., 2015; Van der Lans et al., 2018). A gap is inadvertently created between educational research and actual teacher practice because teachers do not feel adequately prepared on research-based instructional strategies and how to implement the strategies in daily classroom practice (Ford, 2016).

A lack of teacher preparation in college and of professional development from school districts is a reason teachers do not feel confident in understanding research-based

instructional strategies and the impact of strategies on student achievement (Hattie, 2009; Kinyaduka, 2017). Teacher education programs provide a broad overview, and preservice teachers are not provided adequate time to practice in actual classrooms with students (Zeichner et al., 2015). Programs are designed for spans of grade levels or specific content areas and lack individualization for implementing research-based instructional strategies for each grade level or content area (Cochran-Smith et al., 2016; Kumashiro, 2015).

Professional development provides ongoing training for all teachers in school districts (Kruse, 2017; Patton et al., 2015; Whitworth & Chiu, 2015). Professional development for teachers should be usable and transferrable into actual classroom practice. According to Kennedy (2016):

> Education research is at a stage in which we have strong theories of student learning, but we do not have well-developed ideas about teacher learning, nor about how to help teachers incorporate new ideas into their ongoing systems of practice. (p. 29)

Professional development is a key component of teacher development, and for this reason, ongoing training is expected of all educators throughout the state (MODESE, 2013a). Data from focus group interviews reveal teachers feel professional development is most effective when training is ongoing, systematic, and expected of all staff. Many teachers reported district-provided professional development was not always systematic, and many district initiatives faded after only being implemented for a short time. A primary focus on effectively implementing research-based instructional strategies was not evident in any of the school districts.

The literature related to this study was significant, as many studies have been conducted to identify possible causes for the theory-practice gap in education (Ford, 2018; Kinyaduka, 2017; Runesson, 2015). Hattie's (2017) meta-analysis on effective practices in the classroom provides teachers with useable research to leverage teaching practices and improve student achievement. Closing the theory-practice gap requires principals and teachers to deepen their understanding of research-based practices and to implement strategies strategically and with fidelity (Ford, 2018; Hattie, 2009). School districts and universities must also evaluate practices to effectively prepare educators to use research-based instructional strategies in the classroom (Kumashiro, 2015; Zeichner et al., 2015).

Findings

The data from this study originated from four focus group interviews and a survey of kindergarten through fifth-grade teachers from eight selected school districts in southwest Missouri. Twenty-six teachers participated in the focus group interviews. Focus group participants were current elementary teachers in kindergarten through fifth grades.

Among the focus groups, four themes developed from the interviews. The first theme was the frequency of use in the classroom. While many teachers reported using research-based instructional strategies on a daily basis, a majority reported not using the strategies with fidelity or in entirety.

The second theme was the confidence in using research-based instructional strategies. Overall, teachers did not feel confident using research-based strategies or knowing the impact of the strategies on improving student achievement. Teachers

reported it was difficult to know how to measure the effect of strategies on students beyond engagement levels.

The third theme was district-provided professional development and training. All school districts in Missouri are required to provide ongoing professional learning and training to teachers. School districts do not provide the same type of professional learning; therefore, no two teachers receive the same ongoing support and training for professional growth. Teachers expressed frustration because school districts do not provide consistent training from year to year and do not provide practical training for teachers to implement in their classrooms.

The final theme was college preparation and training for new teachers. Educator preparation programs provide preservice teachers with a broad overview of resources and teaching strategies but do not provide preservice teachers with actual practice in the classroom under the mentorship of veteran teachers. The four identified themes provided information necessary to help with closing the theory-practice gap in education.

The survey data were collected to measure how accurately teachers were able to identify the impact level of research-based instructional strategies. Sixty teachers participated in the survey. Participants were elementary teachers who taught kindergarten through fifth grade. Teachers participating in the focus group interviews discussed being unaware of the names of specific strategies or how to measure the impact of strategies on student achievement. While teachers felt confident in their abilities as educators, participants did not feel the same level of confidence in knowing and using research-based instructional strategies that have the highest impact on student achievement. Data from the online survey revealed similar trends. Overall, participants

did not identify corresponding impact levels of research-based instructional strategies with consistent accuracy.

Conclusions

Research question one. At what accuracy level are kindergarten through fifth-grade teachers able to identify research-based instructional strategies that have the highest effect size on student achievement?

Data from the online survey revealed accuracy levels were low. Participants were asked to determine whether a described strategy yields high, medium, or low effects on student achievement. Participants marked over 75% of the strategies as having a high effect on student achievement and were not able to accurately disaggregate the low-and medium-effect strategies from the high-effect strategies.

A high response rate from the survey provides an accurate representation of the sample. Sixty out of the 100 invited participants completed the survey. A majority of the respondents had more than 10 years of experience in education. From the survey data, a majority of teachers reported being moderately familiar to very familiar with research-based instructional strategies. The qualitative data gathered from the focus group interviews showed teachers felt they had a general understanding of research-based strategies but did not feel confident in knowing the specific name of a research-based strategy or the effectiveness of using research-based strategies in the classroom. The qualitative data shows why teachers may have reported a higher familiarity with research-based instructional strategies.

The survey was divided into three research-based instructional strategy sections. The first section on teacher attributes described strategies, including collective teacher

efficacy, teacher-student relationships, and teacher subject-matter knowledge. Hattie's (2009) research on teacher attributes revealed characteristics of effective teachers. The high-impact teacher attribute strategy that can yield almost four times the achievement growth for students in one year is collective teacher efficacy (Hattie, 2009). From the survey, 81.67% (n = 49) of teachers accurately identified collective teacher efficacy as a high-impact strategy. While a majority of teachers correctly identified the high-impact strategy for teacher attributes, teachers were not as effective identifying the medium- and low-impact strategies. No teachers were able to correctly identify teacher-student relationships as a medium-impact strategy or teacher subject-matter knowledge as a low-impact strategy. On average, teachers scored a 50% accuracy rate on the section.

The second section of the survey measured curricula strategies, including conceptual change program, integrated curriculum, and whole-language reading. Curricula strategies are strategies to aide in delivering content or curriculum (Hattie, 2009). Conceptual change program is the high-impact curricular strategy that boosts up to three years of student achievement growth in one year of instruction (Hattie, 2009). An impressive 75% of participants were able to accurately identify conceptual change program as the high-effect strategy in the curricula section. As with the first section, teachers were not able to accurately identify the medium- or low-impact strategy. One teacher was able to identify an integrated curriculum as the medium-impact strategy, and two teachers were able to identify whole-language reading as the low-impact strategy. In the curricula section, the average accuracy rate was 60.08%.

The third section of the survey measured teaching strategies, including the jigsaw method, cooperative learning, and problem-based learning. Hattie (2009) referred to

teaching strategies as universal strategies teachers can implement for all grade levels and content areas. Jigsaw method was the high-impact teaching strategy with an effect size of three times the average year of instruction (Hattie, 2009). Teachers were less accurate in the teaching strategies section than the previous two sections. Only 40% of teachers were able to accurately identify the jigsaw method as the high-impact strategy for the teaching strategies section. Of the 60 participants, 13 teachers were able to accurately identify cooperative learning as a medium-impact teaching strategy, but no teachers were able to identify problem-based learning as a low-impact strategy. Within the teaching strategies section, the average accuracy rate was 52.58%.

Analysis through Pearson's first coefficient of skewness showed the data were distributed symmetrically. The standard deviation for the data was $SD = 1.86$, and the coefficient of skewness was -0.45. A normal distribution showed all scores from the online survey were closely distributed.

Research question two. What is the difference between the ability of new teachers (0-5 years) and veteran teachers (6+ years) to accurately identify which research-based instructional strategies have the highest effect size on student achievement?

Results from the online survey were scored and used to determine teachers' accuracy in identifying the impact levels of the given research-based strategies. Data from the survey revealed there was not a significant difference between new teachers and veteran teachers in identifying the impact levels of research-based instructional strategies. A two-tailed *t*-test was conducted to determine the difference between scores of new teachers with five or fewer years of experience and veteran teachers with six or more

years of experience. Following the *t*-test, the *p* value was $p = 0.62$. The null hypothesis was not rejected, indicating there was no significant difference between the two groups.

Research question three. What are the perceptions of kindergarten through fifth-grade teachers regarding research-based instructional strategies in the following areas: frequency of use, confidence of use, college training and preparation, and quality of professional development?

Responses were collected from four focus group interviews. After coding and analyzing responses, the data provided insight into teachers' perceptions of research-based instructional strategies. Teachers in the focus groups reported various frequency of strategy usage. Some teachers reported not using research-based instructional strategies regularly or as much as they felt they should. Reasons for this included the time factor involved in planning, organizing, and teaching students through unfamiliar research-based instructional strategies. Many teachers felt comfortable using components of strategies but did not implement the complete strategies with fidelity. Other teachers reported using research-based instructional strategies on a daily basis but tended to use just a few strategies regularly based on the dynamics of students in the class.

Teachers reported a lack of confidence in using research-based instructional strategies and knowing the impact of each strategy on student achievement. Most teachers measured the effectiveness of the strategy through student engagement and did not have a quantitative means to confidently connect to implementation of strategies. Overall, teachers felt uncertain about if and how the strategies impacted student achievement.

Teachers shared mixed thoughts on overall college training and preparation. Some recent graduates felt their education programs provided effective training on understanding and implementing research-based instructional strategies. Other recent graduates struggled to remember what was learned during their college training and preparation. Collectively, veteran teachers did not feel college prepared them for teaching and could not remember a focus on research-based instructional strategies. Many teachers felt their master's programs better prepared them with an understanding of how to use research-based instructional strategies in the classroom and the impact of research-based strategies on student achievement.

Quality of professional development varied among teacher focus groups. Some teachers felt their school districts did not provide quality professional development regarding research-based instructional strategies, but rather used staff time for required trainings or team and school collaboration or community time. A few participants expressed frustration over districts moving from initiative to initiative without any sustained focus or priorities. Other focus group participants supported district efforts and agreed professional development opportunities were strategically organized to provide relevant learning to improve classroom instruction. One group of teachers, in particular, discussed the ongoing training received from the MRI. During the focus group interview, teachers shared their learning on specific research-based strategies and the impact of the use of strategies on student learning. Overall, teachers expressed a need for ongoing and specific training relevant to the needs of students. Teachers wanted to continue learning and felt a greater sense of confidence after learning specific strategies to use in the classroom.

Implications for Practice

Teacher preparation is a key component in developing effective educators. Teacher development occurs along a continuum, and the greatest rate of improvement and learning typically occurs within the first five years of teaching (Kruse, 2017). Leveraging this brief time frame within an educator's career is essential in helping educators learn and effectively utilize research-based instructional strategies (Steins et al., 2015; Van der Lans et al., 2018). College preparation and training should provide opportunities for preservice teachers to learn pedagogy, observe high-quality educators, and practice implementing research-based strategies under the supervision and collaboration of university professionals and classroom teachers (Cochran-Smith et al., 2016; Kumashiro, 2015).

Universities and colleges should continue to rethink teacher preparation (Cochran-Smith et al., 2016. Successful preparatory programs provide preservice teachers with a deep knowledge base of research and theory grounded in pedagogy and content knowledge (Zeichner et al., 2015). Preservice teachers need opportunities throughout their education program to practice strategies in the classroom under the supervision of experienced educators (Kumashiro, 2015). Opportunities to learn from experts in the field equip preservice teachers with the confidence to implement similar instructional strategies in the future with their students (Kumashiro, 2015).

Mentorship throughout the first five years of a new teacher's career is essential for increasing retention of educators (Steins et al., 2015). Currently, school districts throughout Missouri are required to provide mentors and beginning teacher assistance for all first- and second-year teachers (MODESE, 2013a). New teachers benefit from

collaborative partnerships with veteran teachers, and mentorships that last longer than two years are more likely to result in stronger retention rates of teachers (Steins et al., 2015). School districts should design new teacher assistance programs with ongoing professional development tailored to building the capacities of new teachers (Hattie & Donoghue, 2016). Deliberate and ongoing training on pedagogy, content, and research-based instructional strategies, including classroom management, will equip new teachers with resources to be successful (Hattie & Donoghue, 2016).

Professional development for all teachers is a requirement for school districts in Missouri (MODESE, 2013a). At a minimum, one percent of a school district's budget must be dedicated to professional development for staff (MODESE, 2013a, p. 7). With this mandate, millions of dollars are spent on professional development for Missouri teachers every year (MODESE, 2019, line 63). Funds are used most effectively when professional development is developed based on the unique needs of teachers (Kennedy, 2016). Ongoing training is more effective for teachers than one-time professional learning events (Hattie & Donoghue, 2016). Teachers learn best and are most likely to incorporate learning from professional development opportunities when the training received is specific and relevant to daily practice (Whitworth & Chiu, 2015). Impactful professional development creates a shift in teachers' thinking that goes beyond knowledge and skills development to help teachers rethink their practice (Kruse, 2017).

Peer observations and walkthroughs are effective and relevant types of professional development (Whitworth & Chiu, 2015). Peer observations or walkthroughs are opportunities for teachers to observe in other classrooms throughout the building or district (Whitworth & Chiu, 2015). Teachers are provided with specific look-fors and

conduct the observations with the goal of learning more about a specific research-based instructional strategy or other effective practice (Whitworth & Chiu, 2015). Peer observations create a collaborative coaching environment where teachers can learn from one another in a non-threatening way (Whitworth & Chiu, 2015). Teachers are able to build supportive and collaborative relationships and improve the professional learning community of the school (Hattie & Donoghue, 2016; Whitworth & Chiu, 2015).

Recommendations for Future Research

Future studies on research-based instructional strategies should extend to secondary teachers. Replication of the study at other grade levels would provide further insight into teacher perceptions of research-based instructional strategies. Secondary teachers usually concentrate on one content area with extensive training and preparation in their content certification. A look into secondary teachers' understanding of research-based instructional strategies is essential to continued research on the theory-practice gap in education.

Another recommendation for future research would be to further develop the survey component of this mixed-methods study. In the current survey tool, participants were provided a descriptive statement about a research-based instructional strategy and were required to assign a high, medium, or low rating to the strategy to describe the impact the strategy is likely to have on student achievement. Findings from the survey show participants reported a majority of the descriptions as having a high impact on student achievement. Organizing the survey tool so participants would have to identify one high, one medium, and one low-impact strategy from each category might provide a

different way to analyze what teachers think they know about the impact levels of research-based instructional strategies.

Finally, future recommendations for research would be to conduct interviews to see if teachers can identify high-impact instructional strategies without prompts. While conducting the focus group interviews, teachers were able to discuss the strategies used in the study after being prompted by the definitions. Asking teachers what they use in their classrooms on a daily basis without being tied to the strategies mentioned in the study would provide a clearer picture of what instructional strategies teachers really use on a daily basis.

This study was narrowed to eight small school districts in southwest Missouri. Further studies should include surveys and focus groups from school districts of different sizes and from different parts of the state or country. The expansion of this study would provide for greater insight and confirmation into teacher knowledge as a potential cause of the theory-practice gap in education.

Summary

The purpose of this study was to determine if teacher lack of knowledge of research-based instructional strategies is a cause of the theory-practice gap in education. This study was also initiated to better understand what teachers think they know about which research-based instructional strategies best leverage student achievement. The study revealed teacher perceptions about teacher preparation programs and district-provided professional development on research-based instructional strategies. The online survey was created as a tool to measure if participants could correctly identify the impact levels of described instructional strategies. The focus group interviews were also formed

as open-ended questions to encourage open dialogue among the teachers who participated in the interviews.

This study included eight schools in southwest Missouri. The survey was sent to 100 kindergarten through fifth-grade teachers within the selected population. Four schools were randomly selected from the population for focus group interviews. Each focus group included a kindergarten, first-grade, second-grade, third-grade, fourth-grade, and fifth-grade teacher. Seven interview questions were asked to collect data on teacher perceptions about the frequency with which research-based instructional strategies were used in their classrooms as well as their confidence in using said strategies. A mixed-methods study was used to triangulate data to answer the research questions.

Focus group responses were recorded, transcribed, and analyzed using open and axial coding. The coding revealed four themes throughout the data. The first theme identified from the focus group interviews was the frequency of use in the classroom. Focus group participants discussed the frequency with which they utilized research-based instructional strategies in their classrooms.

The second theme revealed was the confidence in using research-based instructional strategies in the classroom. Teachers shared their perceptions of how they felt about confidently using research-based strategies in the classroom. The third theme was district professional development and training for teachers. Participants shared the types of professional development provided for teachers in their school districts and whether or not the professional development was related to research-based instructional strategies and the impact on student achievement.

The fourth theme was college preparation and training for new teachers. Participants were asked about their personal experiences in college and the preparation they received prior to entering the classroom. The themes were supported by the literature review of this study. The data from the study revealed that overall, teachers could not accurately identify the research-based instructional strategies which yield high effects on student achievement and did not implement research-based strategies thoroughly or with fidelity in their classrooms. Teachers' perceptions were mixed on college preparation and district-provided professional development in terms of preparation in research-based instructional strategies. These data confirm teachers' lack of knowledge of research-based instructional strategies as a possible reason for the theory-practice gap in education.

An area of concern for the field of education is the gap which exists between research and actual practice in the classroom (Ford, 2018). In studying the theory-practice gap in education, Ford (2018) found, "Teachers use effective practice instructional strategies at a rate of 65%," and "as level of education increases, the likelihood of strategy use does not increase, but the intensity of the use increases" (p. 158). These data are similar to the data revealed in this study. In identifying research-based instructional strategies, the mean score for teachers in all three strategy themes was around 50%-60%. A reasonable observation is to assume if teachers have difficulty identifying the impact of research-based instructional strategies, the rate with which teachers use these strategies in their classrooms may also not be high.

The data from the survey and teacher focus groups provided insight into actual classroom practice and teacher preparation. Consistent and ongoing training is essential

for new and veteran teachers. Providing training by building background knowledge on the why behind research-based instructional strategies can help teachers understand the impact of strategies on student achievement. Connecting relevant professional development rooted in educational research to the classroom helps teachers see success in the implementation of strategies at any grade level or in any content area. Closing the theory-practice gap is imperative for increasing student achievement and improving the effectiveness of teachers.

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Appendix A

Survey Questions

Section 1: 3 Questions

Please answer the following demographic questions as they best describe you.

1. What grade do you teach?
    a. Kindergarten
    b. 1st grade
    c. 2nd grade
    d. 3rd grade
    e. 4th grade
    f. 5th grade

2. How many years have you been in education?
    a. 0-5 years
    b. 6-10 years
    c. 11-20 years
    d. 21+ years

3. How familiar are you with research-based instructional strategies?
    a. Very familiar
    b. Moderately familiar
    c. Slightly familiar
    d. Not familiar

Section 2: 18 Questions

Complete the statements below based on your knowledge of how impactful the following instructional strategies are on student achievement.

Fill in the blank with *high, medium,* or *low* to make the statement correct.

Teacher Attributes

1. A teacher's knowledge of the subject matter he/she teaches is likely to have a _____ impact on student achievement.
2. A teacher who collectively believes all students can learn at high levels is likely to have a _____ impact on student achievement.
3. A teacher who has a positive relationship with his/her students is likely to have a _____ impact on student achievement.
4. A teacher who has a deep understanding of the content he/she is teaching is likely to have a _____ impact on student achievement.

5. A teacher who celebrates and recognizes students is likely to have a _____ impact on student achievement.
6. A teacher who empowers students to believe they can learn at high levels is likely to have a _____ impact on student achievement.

Curricula

7. A teacher who teaches reading through language and experiences rather than through strategies is likely to have a _____ impact on student achievement.
8. A teacher who provides time for students to share how their knowledge has changed after learning a new concept is likely to have a _____ impact on student achievement.
9. A teacher who uses an integrated curriculum approach where several subject areas are combined to teach one theme is likely to have a _____ impact on student achievement.
10. A teacher who uses a whole-language approach to teach reading is likely to have a _____ impact on student achievement.
11. A teacher who provides time for students to discuss what they do not understand or what is difficult about a new concept is likely to have a _____ impact on student achievement.
12. A teacher who designs lessons where students engage in relevant, meaningful activities that can be connected to real life is likely to have a _____ impact on student achievement.

Teaching Strategies

13. A teacher who provides opportunities for students to work in collaborative groups where students teach concepts to other students is likely to have a _____ impact on student achievement.
14. A teacher who utilizes cooperative learning is likely to have a _____ impact on student achievement.
15. A teacher who teaches a subject through the experience of solving an open-ended, real-world problem is likely to have a _____ impact on student achievement.
16. A teacher who uses the jigsaw method is likely to have a _____ impact on student achievement.
17. A teacher who provides opportunities for students to work in small teams with students of different levels of ability to improve understanding of a subject is likely to have a _____ impact on student achievement.
18. A teacher who uses problem-based learning is likely to have a _____ impact on student achievement.

Appendix B

Focus Group Definitions and Discussion Questions

Focus Group Definitions

Collective teacher efficacy. Collective teacher efficacy refers to a staff's shared belief that through their collective action, they can positively influence student outcomes for all, including those who are disengaged and/or disadvantaged (Hattie, 2009).

Conceptual change program. Conceptual change program is a strategy used to strengthen understanding by encouraging students to question their own (or society's) preconceived notions (Hattie, 2009). Teachers confront each student's current paradigms and clarify misconceptions rather than teaching as though the student has no background knowledge (Hattie, 2009).

Jigsaw method. Jigsaw is a cooperative learning strategy which enables each student of a "home" group to become an expert in one aspect of a learning unit (Hattie, 2009). Students meet with members from other groups who are assigned the same topic, and after mastering the material, return to the "home" group to teach the material to the rest of the group (Hattie, 2009).

Research-based instructional strategies. Research-based instructional strategies are teaching strategies, techniques, or influences informed by objective evidence such as educational research or performance data of schools, teachers, and/or students to determine effects on student performance (Marzano, Pickering, & Pollock, 2001).

Focus Group Questions

1. How has the training or professional development you received from your school district prepared you about which research-based instructional strategies have the most impact on student achievement?

2. How did the teacher education program you attended in college prepare you with training and knowledge about which research-based instructional strategies have the most impact on student achievement?

3. How confident do you feel in knowing and using research-based instructional strategies that yield the highest impact on student achievement?

4. How frequently do you use research-based instructional strategies in your classroom?

5. In what ways do you use the jigsaw method in your classroom?

6. In what ways do you use a conceptual change program when developing a lesson?

7. How do you know if there is a high level of teacher collective efficacy in your school?

Appendix C

Focus Group Script

Moderator Introduction and Purpose of Group

Hello, my name is Laura O'Quinn. I'd like to start off by thanking each of you for taking time to participate today. This focus group interview will last approximately 45 minutes.

The reason you have been asked to participate in this focus group interview is to gain further knowledge of your perceptions of which research-based instructional strategies are most effective in terms of student achievement. During this interview, you will be asked about your perceptions of the preparation from your teacher education program as well as professional development received on research-based instructional strategies. You will also be asked about your overall knowledge of research-based instructional strategies as well as the frequency of use and confidence of use on those strategies that yield the highest impact on student achievement.

I'm going to lead our discussion today. I will be asking you questions and then encouraging and moderating our discussion.

I also would like you to know this focus group will be audio recorded. The identities of all participants will remain confidential. The recording allows me to transcribe your responses for the purpose of answering the research questions in my study.

Focus Group Rules and Expectations

To allow our conversation to flow more freely, I'd like to go over some ground rules.

1. Only one person speaks at a time. This is doubly important as I will be creating a written transcript of our conversation today. It is difficult to capture everyone's experiences and perspectives on our audio recording if there are multiple voices at once.
2. Please avoid side conversations.
3. Everyone doesn't have to answer every single question, but I'd like to hear from each of you today as the discussion progresses.
4. This is a confidential discussion in that I will not report what was said in this interview to your colleagues or supervisors. Names of participants will not be asked at any time during the interview, and the coded index card (e.g., 1A, 2A) will be used as identification for responses.
5. Before answering a question or commenting, please remember to announce your participant identification label from your index card.

6. There are no "wrong answers," just different opinions. Say what is true for you, even if you're the only one who feels that way. Don't let the group sway you. If you do change your mind, let me know.
7. Are there any questions?

Introduction of Participants

Before we start, I'd like to know a little about each of you. Please tell me:

1. Your identification label on your index card.
2. How many years you have been in education.

Focus Group Questions

At this point, the moderator will move through the seven focus group questions.

Closing

Thank you for coming today and talking about your perceptions of research-based instructional strategies. Your comments have provided me with valuable information which will assist me in completing my dissertation. I appreciate the time you have given me today.

Appendix D

Survey-Only Letter to Superintendents

<Date>

Dear <Superintendent>:

I am writing to request your participation in my doctoral dissertation research project at Lindenwood University. I believe the information gathered in this study will positively contribute to closing the theory-practice gap between educator knowledge and implementation of effective research-based instructional strategies.

The purpose of this research is to gain teacher perceptions of which strategies are most effective in terms of student achievement and how these perceptions correlate with research. The participants will be asked to complete a survey and will be asked about what grade levels they teach, number of years in education, and familiarity with research-based instructional strategies. Participants will also be asked to determine the high, medium, or low impact correlation to nine different strategies based on their perceptions and knowledge of which research-based instructional strategies are the most effective.

Attached is a link to an electronic document survey. Please forward this to your kindergarten through fifth-grade teachers and their building principals. Your participation is voluntary, and you may choose to withdraw at any time. Confidentiality and anonymity are assured.

If you have any questions, you can reach me at [redacted], or you may contact my dissertation chair, Dr. Shelly Fransen, at [redacted].

Please open the attached link to view the Informed Consent Form and to complete the survey.

Thank you for your time and participation,

Laura O'Quinn
Doctoral Candidate
Lindenwood University

Appendix E

Institutional Review Board Approval

LINDENWOOD

From: irb@lindenwood.edu <irb@lindenwood.edu>
Sent: Friday, March 29, 2019 9:59 AM
To: kgrover@lindenwood.edu; OQUINN, LAURA (Student); SFransen@lindenwood.edu
Subject: IRB-19-202 - Initial: Initial - Exempt

Mar 29, 2019 9:59 AM CDT

RE:
IRB-19-202: Initial - Addressing the Theory-Practice Gap Relative to Teacher-Perceived Knowledge of Effective Instructional Strategies

Dear Laura O'Quinn,

The study, Addressing the Theory-Practice Gap Relative to Teacher-Perceived Knowledge of Effective Instructional Strategies, has been Exempt.

Category: Category 1. Research, conducted in established or commonly accepted educational settings that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

The submission was approved on March 29, 2019.

Here are the findings:

- This research has been determined to be minimal risk because the researcher is not collecting data constituting risk greater than that experienced in daily life.

Sincerely,
Lindenwood University (Lindenwood) Institutional Review Board

Appendix F

LINDENWOOD

Survey Research Information Sheet

You are being asked to participate in a survey conducted by Laura O'Quinn under the guidance of Dr. Shelly Fransen at Lindenwood University. We are conducting this study to gain teacher perceptions of which research-based instructional strategies are most effective in terms of student achievement and how these perceptions correlate with research. You will be asked to complete a survey and will be asked what grade level you teach, number of years in education, and familiarity with research-based instructional strategies. You will also be asked to determine the high, medium, or low-impact correlation to 18 questions based on your perceptions and knowledge of which research-based instructional strategies are the most effective. It will take about five minutes to complete this survey.

Your participation is voluntary. You may choose not to participate or to withdraw at any time by simply not completing the survey or closing the browser window.

There are no risks from participating in this project. We will not collect any information that may identify you. There are no direct benefits for you participating in this study.

WHO CAN I CONTACT WITH QUESTIONS?

If you have concerns or complaints about this project, please use the following contact information:

Laura O'Quinn at lo446@lindenwood.edu

Dr. Shelly Fransen at sfransen@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

By clicking the link below, I confirm I have read this form and have decided I will participate in the project described above. I understand the purpose of the study, what I will be required to do, and the risks involved. I understand that I can discontinue participation at any time by closing the survey browser. My consent also indicates I am at least 18 years of age.

You can withdraw from this study at any time by simply closing the browser window. Please feel free to print a copy of this information sheet.

Appendix G

Survey/Focus Group Letter to Superintendents

<Date>

Dear <Superintendent>:

I am writing to request your participation in my doctoral dissertation research project at Lindenwood University. I believe the information gathered in this study will positively contribute to closing the theory-practice gap between educator knowledge and implementation of effective research-based instructional strategies.

The purpose of this research is to gain teacher perceptions of which strategies are most effective in terms of student achievement and how these perceptions correlate with research. The participants will be asked to complete a survey and will be asked about what grade levels they teach, number of years in education, and familiarity with research-based instructional strategies. Participants will also be asked to determine the high, medium, or low-impact correlation to nine different strategies based on their perceptions and knowledge of which research-based instructional strategies are the most effective. The second portion of the study will involve focus groups to gather teacher perceptions about frequency of use, confidence of use, and knowledge of research-based instructional strategies.

Attached is a link to an electronic document survey. Please forward this to your kindergarten through fifth-grade teachers and their building principals. I will also follow up with a phone call to gain your permission to participate in the focus group portion of the study. Your participation is voluntary, and you may choose to withdraw at any time. Confidentiality and anonymity are assured.

If you have any questions, you can reach me at [redacted], or you may contact my dissertation chair, Dr. Shelly Fransen, at [redacted].

Please open the attached link to view the Informed Consent Form and to complete the survey.

Thank you for your time and participation,

Laura O'Quinn
Doctoral Candidate
Lindenwood University

Appendix H

Recruitment Letter – Qualitative

Dear Teacher:

This is an invitation to participate in a focus group for a research study entitled, *Addressing the Theory-Practice Gap Relative to Teacher-Perceived Knowledge of Effective Instructional Strategies*. I am conducting this study to gain teacher perceptions of which research-based instructional strategies are most effective in terms of student achievement and how these perceptions correlate with research. I am completing this study in partial fulfillment of the requirements for a Doctorate in Educational Administration through Lindenwood University. Attached are the focus group questions and key definitions. On the day of the interviews, I will bring a paper copy of the letter of consent for you to sign.

Thank you,

Laura O'Quinn
Doctoral Candidate
Lindenwood University

Appendix I

LINDENWOOD

Focus Group Research Information Sheet

You are being asked to participate in a research study. We are conducting this study to gain teacher perceptions of which research-based instructional strategies are most effective in terms of student achievement and how these perceptions correlate with research. You will be asked to participate in a focus group and will be asked about your perceptions of the preparation from your teacher education program as well as professional development received on research-based instructional strategies. You will also be asked about your overall knowledge of research-based instructional strategies as well as the frequency of use and confidence of use on those strategies that yield the highest impact on student achievement. It will take about 45 minutes to complete this study.

Your participation is voluntary. You may choose not to participate or to withdraw at any time.

There are no risks from participating in this project. There are no direct benefits for you participating in this study.

We will not collect any data which may identify you.

We will do everything we can to protect your privacy. We do not intend to include information that could identify you in any publication or presentation. Any information we collect will be stored by the researcher in a secure location. The only people who will be able to see your data are members of the research team, qualified staff of Lindenwood University, and representatives of state or federal agencies.

Who can I contact with questions?

If you have concerns or complaints about this project, please use the following contact information:

Laura O'Quinn at lo446@lindenwood.edu

Dr. Shelly Fransen at sfransen@lindenwood.edu

If you have questions about your rights as a participant or concerns about the project and wish to talk to someone outside the research team, you can contact Michael Leary (Director - Institutional Review Board) at 636-949-4730 or mleary@lindenwood.edu.

Vita

Laura Danielle O'Quinn is currently the Assistant Superintendent of Academic Services for the Lebanon R-III School District in Lebanon, Missouri. Laura has worked in the Marshfield School District as an elementary principal and in the Camdenton School District as an assistant principal and kindergarten teacher. She holds a Bachelor of Science degree in Elementary Education from Drury University in Springfield, Missouri; a Master of Science degree in Education Administration from Southwest Baptist University in Bolivar, Missouri; and a Specialist degree in Educational Administration from William Woods University in Fulton, Missouri.

Laura lives in Phillipsburg, Missouri, with her husband, Jared O'Quinn. Laura and Jared have three children, Jayce, Jordan, and Harper. Laura enjoys camping, traveling, and spending time with her family.