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The Perception of Elementary School Principals Regarding Constructivist Approaches

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The Perceptions of Elementary School Principals Regarding Constructivist Approaches

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In the judgement of the following signatories, this Dissertation meets the academic standards that have been established for the Doctor of Philosophy degree.

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Abstract

While it is widely accepted among education scholars that constructivist instructional approaches improve student learning, there is little evidence to suggest that school leaders and teachers are actively supporting or regularly incorporating such approaches in their practice. The purpose of this qualitative study was to examine the perceptions of elementary school principals regarding their role in promoting constructivist approaches to teaching and learning. A phenomenological approach was selected in order to develop a complete and accurate understanding of the participants' feelings and experiences around supporting and implementing constructivist approaches in their schools. Specifically, the study explored the extent to which elementary school principals considered constructivism critical in improving teaching and learning, how they assisted teachers in implementing constructivist practices, and what factors and conditions promoted or inhibited their efforts. Sixteen elementary school principals in Massachusetts answered surveys and 12 out the 16 participated in interviews. The study revealed that principals believed constructivism has a profound influence on the critical thinking and problem-solving skills of students and that principals developed teachers' capacity to implement constructivist approaches. The study also found that barriers existed in implementing constructivist practices at the district level and that creative scheduling allowed adequate planning time and increased opportunities for constructivist approaches. These findings suggest that, despite impediments that prevent its full implementation, constructivist teaching and learning is important to elementary school principals.

Keywords: constructivism, constructivist approaches, principals, teaching, student learning, perceptions, promote/promoting

DEDICATION

To Jerry, my hero, and best friend—thank you for believing in me—I love you. To Elisha, Melissa, and Theresa, my biggest cheerleaders—you are and have always been my inspiration-I love you all dearly. Finally, a thank you to each of my grandchildren. David, thank you for your love of reading and for your willingness to listen and share your thoughts. Courtney, your daily encouragement was a source of inspiration. Jessica, your endless texts supporting me, praising me, and lifting me up kept me motivated. Jacob, your wonderful, gentle smile reassured me that I could do anything. And Evan and Luke, my little loves from across the pond—you, of course, believed that there's nothing I couldn't accomplish; therefore, I had no choice but to succeed! I hope that this process serves as a source of inspiration to all of you.

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CHAPTER ONE: INTRODUCTION

Personal Background

After 32 years in the field of education in numerous roles, including teacher, writing specialist, curriculum specialist, intervention specialist, braillist, and administrator, I decided to pursue a role in school leadership. During my time in these roles, I observed teacher-student interactions and approaches used to teach students. Not all approaches, however, reached all students. As an intervention specialist, I became aware of the many differences and experiences that children brought with them. As a teacher, I learned about approaches that worked with the diversity of learning styles that enabled students to grow and learn to their potential. Then, as a curriculum specialist, I realized that I had the ability to impact teaching and learning in the classroom. When I realized that teachers needed even more support, I knew that I wanted to pursue a leadership role. Finally, as an administrator, my responsibility was to ensure that teachers received continuing professional development that provided them the necessary knowledge to best support their students.

Before assuming these positions, however, I traveled across Europe and interacted with many individuals from diverse backgrounds and cultures. These interactions helped shape my perspective as well as increase my cultural competence in examining my own ethnicity. This helped me to understand and respect the cultural differences of children and the impact it made on students learning in the classroom.

While I was an undergraduate, I held a position as a psychology intern at the University of Massachusetts (UMass) Medical School in Worcester, Massachusetts. While there, I served as an intervention specialist in the intensive care unit. I worked with children from diverse ethnic backgrounds in the pediatrics unit and connected with children and family members from many

different cultures. The life events and stories of these families helped shape the course of my life and caused me to reflect on effective communication that has purpose and meaning.

I also conducted research at one of the largest elementary schools in New England while completing work on my master's degree in education. There were approximately 800 kindergarten to 6th grade students who received free or reduced lunch due to economic disadvantages. I wondered how we could promote teaching and learning experiences that supported all students in achieving higher levels of learning. These students were my first "subjects," and I was intrigued by how they constructed knowledge. For example, students often approached science by applying a constructivist approach, and students of all levels and ethnicities were actively engaged and seemed motivated to learn. With guidance from teachers and collaboration with their peers, learners focused on socially shared activities to internalize learning procedures and achieve higher mental processes (Vygotsky, 1978). I was both encouraged and excited to see students achieving what they had struggled over previously. They were grasping ideas and making connections through critical thinking. Over the years, my experiences as a school leader have helped frame my understanding of the importance of the principals' role in promoting effective approaches to teaching and learning. In my experience, however, the adoption of evidence-based teaching practices seems rare. Districts often adopt too many initiatives that do not match the goals of their schools, a situation that is compounded by a lack of support through professional development.

The objective of education is not merely to convey a body of knowledge; it must enhance the ability of learners to access and apply knowledge, solve problems, evaluate, think independently, apply appropriate judgment, and collaborate with others to make sense of new situations. It is vital for today's students to think critically and creatively. The Chinese proverb

"Tell me and I forget; show me, and I remember; involve me, and I understand" articulates succinctly the philosophy behind inquiry-based learning that leads to critical thinking. In the schoolhouse, the leader ensures that their faculty members are aware of and have access to current theories and best practices (Marzano, Walters, & McNulty, 2005). This access requires that principals stay current with emerging research to facilitate the passing of new knowledge on to faculty for implementation in the daily functions of the school. Making instructional changes can be a challenging task for school leaders; however, the principal must be willing to challenge the status quo (Marzano et al., 2005).

Despite sweeping changes in modern educational standards, there has been little change in the basic structures and approaches used to help students reach higher standards of learning (Lambert, 2002). Brooks and Brooks (1999) noted that students do not learn to apply knowledge to new settings or solve real-life problems when instructional strategies promote test-taking skills. The objective of education is not merely to convey a body of knowledge; it must enhance the ability of learners to access and apply knowledge, solve problems, evaluate, think independently, apply appropriate judgment, and collaborate with others to make sense of new situations.

Statement of the Problem

The standards and accountability movement impacted schools significantly, as states adopted standards for testing student learning while demanding high achieving results of school administrators. The changing demands on student learning shifted emphasis from student improvement to test results (Lambert, 2002). Students are at a distinct disadvantage in learning today due to the rapid transformations taking place around the world—including in education (Stewart, 2012). "Overall, the United States has lost ground" (Stewart, 2012, p.13). The United

States has fallen from 1st to 8th place globally for students receiving a high school diploma since 2009 (Stewart, 2012). As other countries expanded their primary and secondary programs, they demonstrated substantial gains in student achievement, thereby increasing the levels of college attendance. The United States struggles to expand and develop programs to ensure attendance and graduation rates of all students. Sadly, The United States educational performance has been level for decades (Stewart, 2012).

Constructivist leadership engages the school in a shared purpose and involves the application of concepts of constructivism to the learning community to enhance teaching and learning (Lambert, 2002). Critical thinking and problem-solving skills foster effective decision-making and must be considered in decision making in the educational change process.

Constructivism is a learner-centered approach emphasizing the cognitive change that takes place when a learner goes through a process of disequilibrium based on their previous conceptions (Slavin, 2015). The density of the learner's cognition in constructivism drives their learning needs. The value of providing learners with the ability to have choices in their learning as well as a variety of opportunities for learning is that they become motivated contributors to the learning-teaching experience. Providing learner-centered experiences and opportunities for learner collaboration encourages individuals to make sense of information for themselves and to assist novice learners in the development of expertise. The use of representational activities linked to culturally shared systems (e.g., language) supports all learners in the classroom (Steiner & Mahn, 1996).

Knowledge is the driver of productivity and economic growth (David & Foray, 1995). For students to be competitive in a global job market, they must be aware of the complexities of real-world problems and ways to solve them (Lombardi, 2007). Cultural knowledge emerges

within classrooms with co-participation and joint discovery; students build upon shared value systems that they bring to school (Steiner & Mahn, 1996).

The focus of much past research was the consequence of high-stakes testing and accountability for teachers, administrators, students, and schools (Brooks & Brooks, 1993). In contrast, constructivist theory places students at the center of teaching and learning. The 21st-century global workforce requires an education that enables imagination (Friedman, 2007).

Many public schools struggle to adequately prepare students for success in the 21st-century workplace. Students in the United States trail their foreign counterparts by two to three years academically (Hanushek, Ludger, & Woessmann, 2012). Since 1970, the United States has fallen from first to twelfth in education among developed nations (Bettelheim, 2010). Overall, the U.S. ranks as an average performer in reading (14 in OECD) and science (17), but the U.S. drops below the OECD average in mathematics (25) (OECD, 2009). Additionally, there is a gap between the top 10% and the bottom 10% of 15-year olds in the U.S, a gap similar to that observed between top and bottom performing PISA countries (OECD, 2009).

Students are widely viewed by society as graduating from high school and college unprepared to enter the workforce, and many employers report that young college graduates are unprepared to succeed in the 21st-century global economy (Bettelheim, 2010; Friedman, 2005). The 2009 Program for International Student Assessment (PISA) revealed that American students were poorly prepared to compete, and the school system did not provide students with problem-solving and critical-thinking skills (OECD, 2009). In 2012, U.S. Secretary of Education Arne Duncan (2012) observed that American students were poorly prepared to compete in today's knowledge economy. These deficiencies have serious implications for education and the place of the United States in a competitive global society (Stromquist, 2002). Students need to think,

reflect, problem-solve, and work collaboratively to create new knowledge and meaning rather than memorizing facts and regurgitating information (Taylor, 2002). Schools, however, often teach skills consistent with early 20th century models of workplace and society that focused on creating compliant workers for an industrial age (Hoerr, 2013). The modern job market demands a different way of thinking in a globalized economy, and jobs in the globalized workforce require a flexible mindset to comprehend new knowledge (Rand, 2004). As a result, schools must prepare students for jobs that are not yet created, technologies not yet invented, and problems not yet apparent (Schleicher, 2010). Only through a paradigm shift in current teaching approaches can schools accomplish this goal (Vogel, 2012).

One approach that might facilitate improvement in students' critical thinking skills is a more effective integration of constructivism into the daily practice of teachers. Constructivism is a learning theory that explains how individuals acquire knowledge. It is a philosophy that enhances students' logical and conceptual growth (Driscoll, 2000) and, therefore, has direct application to education. Constructivism allows teachers to understand the different dimensions of the learning process, ranging from the personal to the social (Tobin & Tippins, 1993). Critical components of constructivism include critical thinking, problem-solving, communication, and collaboration skills (American Management Association, 2010). To meet the challenges of the 21st century, students must be proficient in each of these, but critical thinking is the most significant. Developing these skills may be a key organizing concept for all educational reform (Bulach, Lunenburg, & Potter, 2012).

Critical thinking and problem-solving require careful analysis and evaluative reasoning skills (Nosich, 1982). Students must be systems thinkers; they must be able to analyze how parts of a whole interact with each other to effectively make arguments and decisions (Hoerr, 2013).

Constructivism relies on critical synthesis of and reflection on learning experiences through teamwork, collaborative learning, and working with a diverse group of learners. Langer and Applebee (1987, p. 77) note that "A process approach, where students are able to explore new ideas and experiences is strengthened through constructivism [as] students elicit and support their own thinking." In a process approach to learning, teachers provide less information but elicit and support more individual thinking and meaning-making skills.

Critical thinking, collaboration, creativity, and communication are all important learning skills in an information-based economy. Students acquire more knowledge when they feel motivated to learn and apply more cognitive energy to classroom investigations and discussions when they find topics interesting. Students desire to know more about an idea or a question when they actively question and reason during the investigation (Brooks & Brooks, 1993). Teachers provide guidance and questioning techniques so that students increase engagement and persistence with activities. Constructivist teaching increases time on task, an important factor that influences how students learn and achieve (Brophy, 1988; Larson, 2000; Wigfield, 1994). By providing scaffolding for learning, constructivist teachers support students in building new skills and increasing motivation (Collins, Brown, & Newman, 1989). By engaging students in the construction of knowledge results in a sense of challenge, self-control, and curiosity; students gain recognition from others and become more motivated in the learning process (Malone, & Lepper, 1987).

Purpose of the Study

The purpose of this study is to identify perceptions of elementary school principals regarding their role in supporting teachers in implementing constructivist approaches to teaching and learning. I am interested in how elementary school principals understand constructivism, the

degree to which they feel constructivism is an essential instructional approach, and whether they consider it a vital part of their leadership roles. As well, this study will explore the various approaches elementary principals use to help teachers implement constructivist approaches. The following questions guided this study:

- To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?
- How do principals report they help teachers implement constructivist teaching and learning?
- What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

Definition of Terms

Constructivist approaches

Weber (1893) stated that constructivism is a learning philosophy that enhances students' logical and conceptual understanding based on their learning experiences. It is a philosophy that generates knowledge and meaning from interaction between a learner's experiences and ideas.

Elementary principals

Educators who work as principals for kindergarten through 6th grade.

Perceptions

The conscious recognition and interpretation of sensory stimuli as a basis for understanding, learning, and knowing. Perception is the ability to see, hear, or become aware of something through the senses, i.e., insight or intuition gained through use of the senses to form an opinion.

Promote/promoting

The efforts principals make to help teachers learn and/or use constructivist approaches.

Significance of Study

Constructivist approaches are vital in facilitating learning for all students. As school leaders seek to improve teaching and learning, understanding the essential principles of constructivist approaches to teaching will be a critical component. This study provides information for future leaders so that they are better able to help teachers and students develop critical thinking, cognitive, and problem-solving skills. Providing this information to universities is vital to the preparation of effective school principals and classroom teachers.

Glasersfeld (1998, p.16) stated that "The major effect of constructivism on teaching has been to open up new possibilities: it has justified the introduction of types of teaching practice which base the acquisition of knowledge on the elaboration of knowledge by the students themselves." The facilitation of these approaches depends on two conditions. First, a teacher's knowledge based on the theory and application of teaching constructivism must be relevant and adequate to the didactics of constructivism. Second, a teacher's ability to interpret students' cognitive activity must be relative to the implementation of their strategies. The field of education has undergone a substantial shift in the nature of human learning as well as the conditions promoting best practices. For over a quarter of a century, the constructivist perspective on learning has become so influential that it represents a change in the epistemology of knowledge and theory of learning (Cooper, 1993).

This study offers new insights into the potential impact that constructivist approaches may have on teaching and learning. Groups that might benefit from this study include administrators, curriculum directors, teachers, superintendents, colleges, and universities as well

as district and state personnel working in capacities involved with teaching and learning. The results of this study may reveal perceptions of elementary school principals regarding their role in promoting constructivist approaches that will benefit others in the field of elementary education.

Review of the Literature

The review of the literature served to frame this study. Chapter Two summarized the literature and bodies of research on constructivist teaching and learning and is comprised of four sections. The first section focused on the definition and philosophy of constructivist learning. The second section considered knowledge construction and implemented approaches that promote constructivism as an effective approach for classroom teaching and learning in elementary schools. The third section examined the conditions necessary in the classroom to promote constructivism, and the fourth section examined the responsibility of the school principal influencing changes in the culture of teaching and learning in constructivist environments.

Constructivist Learning

This section explored the literature regarding constructivism and the philosophy of learning. The work of Dewey (1916), Piaget (1972), Vygotsky (1962), and Bruner (1960) are reviewed. As well, the researcher also investigated the construction of knowledge and the numerous benefits attributed to constructivist approaches through the work of Woolfolk (2004), Fosnot (1989), Omrod (2009), Mason (2010), Numerich (2010), Ward (2001), Tam (2000), and Duckworth (1987).

Significant constructivist approaches to teaching and learning

This section explored the literature regarding the strategies, techniques, and methods in implementing constructivism in elementary classrooms. Books and journal articles as well as National Research and international publications were reviewed. Researchers included Chaille (2008), Reigeluth & Curtis (1987), Hmelo-Silver, Duncan, & Chinn (2007), Zhan (2008), Brooks & Brooks (1999), Maddux, Johnson, & Willis (1997), Resnick (1987), Sergiovanni (1992), and Schmoker (1996).

Factors and Conditions that Inhibit and Promote Constructivism

Multiple factors and conditions contribute to the effectiveness of the learning environment. These are reviewed through the writing of Gould (1996), Brooks & Brooks (1993), Wilson (1998), and Shapiro (2002). Also considered is the responsibility of the school principal in influencing changes in the culture of learning. Some researchers in this section include Fullan (2001), Lambert (2002), and Senge (1990).

Design of the Study

The study is a phenomenological qualitative study. This methodology was chosen in order to arrive at common themes and perceptions of the individuals experiencing similar phenomenon. The research was guided by three questions regarding principals' perceptions of their role in fostering constructivist teaching and learning in elementary schools. Phenomenology relies on the lived experience of multiple individuals; it is a way of researching essential meanings of phenomena (Creswell, 2007). Patton (2002) noted that it is crucial for the researcher to experience the phenomenon as directly as possible, either through participant observation or in-depth interviewing. The results and analysis of the data informed the findings of the study.

Delimitations

The focus of this study is delimited to the perspective of elementary principals (kindergarten through 6th grade) who work in public schools in Massachusetts. The researcher collected only the self-reported beliefs of elementary school principals. The survey consciously excluded the socioeconomic, cultural, and racial backgrounds of participants. Further delimitations included sample size and demographics. Due to time constraints, the researcher did not observe students or teachers. This study examined conditions that inhibited or fostered constructivism for students from the perspectives of principals. It did not include the perceptions of any other school personnel.

Selection of Participants

To achieve a sufficient sample, the researcher contacted a minimum of 185 elementary school principals throughout Massachusetts in grades K-6 using simple random-theory selection. The goal of the simple random theory sample was to reduce the potential for human bias in the selection of subjects. The sample was highly representative of the study population. Moore and McCabe (2006) explained that "a simple random sample (SRS of size *n*) consists of individuals from the population chosen in such a way that every set of *n* individuals has an equal chance to be the sample actually selected" (p. 219). This method allows for generalization, i.e., statistical inferences, from the sample to the community, which is a significant advantage because generalizations are more likely to have external validity. This process allows the researcher to study a statistical subgroup whose corresponding data may determine the trends of the population, and it simplifies the calculations thereby reducing the margin of error for statistical analyses.

The researcher contacted principals by accessing the Department of Elementary and Secondary Education (DESE) contact listing. The criteria for the selection of participants included K-6 principals currently working in a Massachusetts public school and holding a current license. The interview protocol and questions appear in Appendices D and F. The researcher randomly selected and recruited participants through electronic email. Electronic invitations (Appendix A) were sent to Massachusetts elementary principals. This letter described the researcher, the purpose of the study, protected anonymity of the participants, time requirements, and confidentiality for participants. It also included a consent form for participation in the study. Participants were requested to return the letter within two weeks.

There was no limitation on the location of elementary school principals, e.g., urban, rural, suburban. In choosing schools to invite for participation, the researcher sought elementary schools that included a range of socioeconomic and ethnic populations as well as a range of performance outcomes and goals. There were no restrictions on the types of elementary school principals that were allowed to participate other than they must function as principals in a public elementary school in Massachusetts.

A sample size of 12 principals completed follow-up interviews. Creswell (1998) suggests up to 10 participants is optimal for a phenomenological study. Furthermore, Creswell states that data saturation in research typically requires 10 participants. With the initial contact email, the researcher confirmed participants' consent for both stages of the study. The researcher employed a semi-structured interview protocol utilizing open-response questions during the interview process. All interviews were audio-recorded and transcribed. Participants were selected for follow-up interviews based on their responses. The researcher contacted all participants and informed them of the goals of the study, due dates for the questionnaire, and criteria for the

interviews. They were also informed of the requirements for the consent form (Appendix A) before the interview process begins. Follow up interviews took place at the interviewee's school at a time that was mutually convenient to the participant and the lead researcher.

Instrumentation

The data was gathered utilizing two instrumentation protocols. The first instrument employed an online web-based questionnaire, which was distributed electronically to 185 elementary principals in grades K-6th grade. The second instrument utilized an interview guide followed by a questionnaire conducted through an interview phase including a semi-structured, open-ended interview. The second instrument contained the subset of elementary principals responding to the electronic email and volunteering to be interviewed. Both instruments were designed to address the research questions.

Phase 1: Survey

The questionnaire instrument included both open-ended and closed questions using a Likert scale. Ten of the 12 questions are designed for principals focusing on learner-centered approaches in the classroom. Two of the twelve are open-ended questions eliciting principals' perceptions regarding learner-centered approaches and evidence of practices seen in the classroom.

Phase 2: Interviews

During the second phase, individual interviews were conducted with a subset of elementary principals in grades K-6 gleaned from the on-line questionnaire. The interviews were conducted in person at the principal's school. The interviewer used a questionnaire guide and the interview was designed to address the research questions. Each participant answered identical questions; however, the researcher asked additional questions to clarify participants' responses.

The questions were semi-structured and open-ended. Each interview was designed to be a face-to-face in-depth interview. Member checking was integrated throughout the interview process to ensure clarity and interpretation of the information.

Data Collection Methods and Procedures

All data were collected to answer the following three research questions:

- To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?
- How do principals report they help teachers implement constructivist teaching and learning?
- What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

Data was collected and organized in two phases. In the first phase of the study, the researcher sent an online questionnaire to participants. After participants returned questionnaires, a numeric code was assigned to each participant to ensure anonymity during analysis. During the second phase, the researcher interviewed participants in face-to-face interviews to ask clarifying questions based on the questionnaire. The researcher used a script of semi-structured, open-ended interview questions and provided brief descriptions of any key terms necessary for an accurate understanding of the interview questions.

The use of open-ended questions allowed participants to contribute rich and detailed information. The researcher collected the perceptions of elementary principals and examined responses for themes and patterns that reflected the guiding research questions. All interviews were audio-recorded and transcribed. Notes were taken during the meetings for analysis. Steps

were taken to address confidentiality, biases, validity and reliability, (trustworthiness) and are detailed in Chapter three.

Data Analysis Methods and Procedures

Data analysis reflected the research questions. Creswell (2013) noted that phenomenological studies often rely on interviews. Employing a phenomenological approach for data collection provided a more accurate understanding of the phenomenon in question. The researcher analyzed data from the semi-structured interviews using a systematic approach, which is common in qualitative research (Miles & Huberman, 1994). This procedure involved data collection and review to detect similarities and differences in interview responses. Thematic coding was utilized to identify passages of text with similar themes or ideas. Data were sorted into themes, patterns, and categories to establish thematic trends using data analysis (NVivo) software (Gibbs, 2007).

Creswell (2007) stated that the use of triangulation provides greater depth to a study and reduces the likelihood of misinterpretation. The researcher categorized each interview using independent numeric identifiers to ensure anonymity. Identifying codes were used on interview forms, in notes, on audio files, and on transcript documents. Data collection and sampling continued until there was data saturation (Miles & Huberman, 1994; Strauss & Corbin, 1998; Weiss, 1994). According to Strauss and Corbin (1998), saturation is a "matter of degree" (p. 136). The most significant problem in qualitative research work is not a lack of data but an excess of it. Therefore, as the analysis takes shape, the researcher cut data when necessary (Strauss & Corbin, 1998).

Each interview lasted between 40 and 60 minutes, depending on the interviewees' responses. All interviews were audio-recorded using a digital recorder. Triangulation was

accomplished by asking questions on similar topics with various phrasing of the question designed through a web-based survey and in-depth interviews (Creswell, 2003). Data was organized for each source and then read through to gain a clearer understanding of emergent themes. The researcher created codes and counted their frequency in order to identify patterns and themes that arose from the data. After transcribing interviews, the researcher read through each transcript, checked memos, and checked short phrases that summed up the text. Through the process of writing memos, the researcher tracked the emergence of patterns and any changes related to the category to refine the analysis.

The researcher analyzed and coded data using electronic analysis to ensure data accuracy in determining all connections between emerging themes and patterns. Data were analyzed by means of NVivo software. NVivo software stores data in thematic nodes and codes by specific themes using descriptive statistics when analyzing the results. Furthermore, data were coded by cases or specific entities that gathered more specific detail pertaining to the study. Steps were taken to address confidentiality, biases, validity, and reliability and are detailed in Chapter three.

Trustworthiness

To ensure reliability and validity, the researcher engaged in member checking, asking participants to read and judge the analysis and interpret it for themselves (Holloway & Wheeler, 2010). According to Lincoln and Guba (1985), member checking is the most critical credibility technique to ensure trustworthiness. Member checking aids the analysis by teasing out overarching themes. Reliability and validity were also ensured through triangulation involving individual interviews, questionnaires, and rich descriptions that form the major data collection of the study.

Confidentiality

Identities of individuals who agreed to participate in the study were confidential and in no way present in their responses (Creswell, 2003; Leedy & Omrod, 2005). The consent form and invitation letter guaranteed this confidentiality (Appendix A). The researcher attached no names or email addresses to the surveys. Once completed, the researcher assigned numeric identifiers to the surveys. Information was kept on the researcher's laptop in a secure location accessible only to the researcher. Steps were also taken to ensure that only the researcher had access to all information and data which is explained in detail in Chapter three.

Chapter Outline

CHAPTER ONE: INTRODUCTION

The first chapter introduces the dissertation and provides an overview of the study. The chapter begins with a personal statement that describes how I became interested in the topic. It also contains the statement of the problem, the purpose of the study, and the three questions guiding the study. In addition, Chapter One includes the delimitations and rationale for the study. Chapter One includes key terms, an overview of the proposed literature review, and the significance of the study.

CHAPTER TWO: REVIEW OF THE LITERATURE

Chapter Two establishes the conceptual framework for the study through a comprehensive review of the literature examining the philosophical underpinnings, major contributors, and theories surrounding constructivism. This chapter presents an examination of pertinent literature regarding the research questions. This review of the literature includes educational leadership, cognition, psychology, philosophy, and the work of Vygotsky, Piaget, Bruner, and Dewey.

CHAPTER THREE: METHOD

Chapter Three presents the methodology for the study. The design is a phenomenological qualitative approach. This chapter includes a discussion of the methods to identify participants, data collection procedures, and data analysis. Chapter Three also addresses issues of trustworthiness and confidentiality.

CHAPTER FOUR: RESULTS AND FINDINGS

Chapter Four consists of the presentation of data analysis and results. It organizes the data according to the three guided research questions that serve to frame the study. This chapter provides data that is relevant to each research question and concludes with findings for each question. There is a summary to conclude this chapter.

CHAPTER FIVE: SUMMARY DISCUSSION, FUTURE RESEARCH, AND FINAL REFLECTIONS

Chapter Five provides a summary and conclusion of this study. It includes a discussion of the findings and implications for future research regarding the subject area of constructivism as well as other areas related to this field.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter offers a detailed examination of constructivist theory and how it contributed to present understandings of educational approaches to teaching and learning. The review also includes an exploration of the philosophical and historical underpinnings of constructivism as well as its definition and applications. The researcher also investigated studies examining constructivism in practice as well as the numerous benefits attributed to constructivist approaches specifically related to constructivism in elementary schools. Finally, this review will explore the scholarship surrounding strategies and procedures for implementing and sustaining successful constructivist approaches to teaching and learning in elementary schools.

There has been much scholarship dedicated to the concept of constructivism over the last 30 years. Constructivism dates back to Socrates and Kant and its roots are firmly planted in philosophy and psychology. Current constructivists' pedagogies, however, draw on the writings of early 20th-century Russian psychologist Lev Vygotsky and American philosopher/psychologist John Dewey. Vygotsky posited that learning is a social construction, and, as such, is socially, developmentally, and culturally mediated (Fosnot 1996). Constructivist classrooms offer significant educational benefits in supporting critical thinking and problem-solving skills. Learners' code, process, and construct meaning through their own unique understandings based on their previous experiences. There is a gap, however, between what occurs in traditional classroom instruction and what research indicates is effective instruction for all students.

Traditional methods typically include lectures, direct instruction, and seatwork, which often does not work for all students and has remained unchanged for decades. For any substantial

change to take place in instructional practice, there needs to be a paradigm shift in teacher preparation programming that incorporates constructivist approaches in the classroom. Most teachers who have received traditional training have had little to no exposure to constructivist approaches.

Philosophical and Historical Context

Since 1993, there has been a shift in the planning and design of instruction. According to Cooper (1993) this shift can be explained as a change from behaviorism to cognitivism and from cognitivism to constructivism. Furthermore, this shift indicates that education itself has experienced growth in its understanding of human learning that acknowledges learning.

Constructivism is a philosophy of learning founded on the belief that students learn by actively constructing their own knowledge based on prior experiences (Bruner, 1966). In constructivism, students are shapers of meaning and knowledge. Constructivism emphasizes the processes by which learners create and develop their own ideas; therefore, it stands to reason that in forging critical thinking skills, educators must develop curricula that not only matches students' learning styles and preferences but also challenges their understanding, fostering further growth and development of the mind (Mason, 2010; Baltes, 2007; Kincheloe, 2006; Leitner, 2010).

Throughout the 20th century, two conflicting views pertaining to child development and the purpose of education have framed the teaching and learning of pedagogy in teacher education. In the first view, the purpose of education is to support a child's interests and needs. The guiding principles of this educational method are based on a theory of cognitive development that identifies the individual as the subject of study. In the second view, the purpose of education is focused more on the social transformation and reconstruction of society in

alignment with democratic ideals. Central to this theme is that Piagetian constructivism is aligned with a focus on education for individual cognitive development while methods of Vygotskian constructivism are aligned with a focus on education for social transformation (Vadeboncoeur, 1997, p. 15).

There are several definitions of the term "critical thinking"; however, one of the earliest goes back to John Dewey in 1933 (Kwan & Wong, 2015). Dewey referred to critical thinking as reflective thinking and commented that "[t]o maintain the state of doubt and to carry on systematic and protracted inquiry — these are the essentials of thinking" (1933). Furthermore, Dewey contended that "the art of critical thinking becomes crucial when there is a demand for the solution for a perplexity" (1933, p.7). He stated that, like the scientist whose chief responsibility was to remain uncertain, the thinker must cultivate a capacity for not only welcoming but seeking doubt. If a suggestion is at once accepted, we have uncritical thinking characterized by a minimum of reflection.

Many theorists contributed to the constructivist theory, most prominently Dewey (1916), Piaget (1972), Vygotsky (1962), and Bruner (1960). According to Dewey (1916) the constructivist philosophy is the belief that individuals actively and subjectively construct all knowledge. In contrast, Piaget believed that learners should construct the meaning of the text and use it in context with others in the classroom (Piaget, 1972). This is an important understanding, as it is critical for the teacher to use the developmental stages of learning in order to monitor students' pace of learning and match further learning activities to their conceptual development. According to this view, learners must be self-initiated and actively involved in learning through multiple opportunities to explore and express their thoughts (Dewey, 1938). Dewey (1938) advocated that student interests should drive teacher instruction: "I believe that

the psychological and social sides [of learning] are organically related and education cannot be regarded as a compromise between the two or a superimposition of one upon the other" (Dewey, 1897, p. 2). Moreover, because learning is social, situational, and grounded in lived experience, learners should be grounded in realistic learning situations. Dewey's social learning theory can be witnessed in learner-centered classrooms to this day.

The chief theorists in cognitive constructivism are Piaget (1972) and Bruner (1960) while Dewey (1933) is considered the philosophical founder of constructivism. Vygotsky (1978) is the major theorist among the social theorists, and his ideas are considered central to current thinking about constructivism today. Contrary to Piaget, Bruner's (1973) theory is a more social process, whereby students construct new concepts and knowledge based on where they currently are situated in their knowledge. The work in developmental psychology by Dewey, Vygotsky, and Piaget during the 1980s complemented the work of other researchers who suggested that knowledge construction, cooperation, self-regulation, and transfer of appropriate problems are important aspects of learning and promoting achievement. While Piaget's theory focused on the stages that the learner passes through, Bruner's (1987) theory focused more on the impact that culture has on learning.

Constructivism is both a philosophy of learning and an instructional technique that has increased in popularity over the past few decades (Tobias & Duffy, 2009). It is a vigorous and convincing alternative to existing educational paradigms that avoids over-reliance on rote memorization (Lipman, 1991). Traditional classroom lessons often fail to effectively or reliably engage and motivate students (Dewey, 1938; Slator et al., 2006). Under traditional classroom instruction, students are often unable to answer complex questions, solve problems, or explain the underlying reasons or methods they use to reach conclusions (Staver, 1989).

Constructivism employs two major perspectives: cognitive constructivism and social constructivism. Cognitive constructivism pertains to how children learn and understand what they learned (Piaget,1972). Individuals learn by actively constructing new knowledge through authentic activities rather than through application of isolated skills. Social constructivism is the theory that social or cultural experiences influence an individual's construction of knowledge and methods of understanding (Airasian & Walsh, 1997; Eggen, 1997; Gergen, 1994; Vygotsky, 1978).

Both cognitive and social constructivist theories address teaching methods to facilitate student learning; however, the two perspectives differ regarding language development theory. Thinking precedes language in cognitive constructivism and language precedes thinking in social constructivism. The cognitive approach assumes that development is a natural biological process that all individuals experience and involves problem-solving that promotes integration of new information into the learner's existing knowledge for reflection and creativity. Bruner (1961) explained that learners use various processes for problem-solving and that these processes are the foundation of good learning.

Social constructivists suggest that students learn best through social interactions in the classroom (Vygotsky, 1962) and that these interactions can result in changes in conceptual understanding and thinking (Dewey, 1938). Vygotsky suggested that learners needed assistance to achieve goals. When students work cooperatively, they solve problems more quickly than when working individually. Collaboration with skilled partners provides intellectual guidance, and the learner masters complex tasks they might be unable to attempt otherwise (Vygotsky, 1978). Furthermore, the role of social interaction in the development of cognition strongly affirms community as playing a central role in the meaning-making process of the learner's

development (Vygotsky, 1978). Individual children actively construct knowledge by creating and testing their own theories of the world (Piaget 1952). Cultural influences are considered critical to cognitive development, and a person's sociocultural background and situation play a significant role in determining what types of information an individual will learn as well as in molding the cognitive processes that an individual will use to build and operate schemas (Kever, 2003). Vygotsky maintained that constructivism focused more on the transfer of the tools of knowledge, i.e., culture and language, while Piaget (1970) emphasized the individual creation of new knowledge, suggesting that the classroom must provide students with activities to challenge them to discover new ideas while constructing new knowledge.

Lastly, Bruner's (1961) theory on constructivism reflected the works of both Piaget and Vygotsky. Bruner focused on early learning and the development of thinking and suggested that learning is a process of discovery and that learners build their own knowledge through active dialogue with teachers, e.g., the Socratic method (Woolfolk, 2004).

Constructivism and Critical Thinking

Constructivist strategies include process approaches to learning that create autonomous, inquisitive thinkers (Fosnot, 1989). These approaches challenge students to explore questions while working cooperatively in solving problems at higher levels of thinking during which time students balance the use of creative and critical thinking. According to Bulach, Lunenburg, and Potter (2012) critical thinking may be a central organizing concept for all educational reform. Critical thinking changes how teachers teach and how students learn (Mason, 2010). Numrich (2010) suggested that only people who think through content critically really learn it. Students must understand, not memorize, content to truly internalize information and generate new ideas.

Constructivists emphasize creativity and collaboration among students to develop new ideas (Baltes, 2007; Kincheloe, 2006; Leitner, 2010).

Fosnot (1996) provided four epistemological assumptions of constructivist learning: (a) learners physically construct knowledge during active learning; (b) students create their own representations of action; (c) learners socially construct knowledge and convey meaning making to others; and (d) learners theoretically construct knowledge to explain things they do not completely understand. Langer and Applebee (1987) claimed that "students have the best chance to focus on the ideas they are writing about and to develop more complex thinking and reasoning skills as they defend their ideas for themselves" (p. 69). Applebee (1993) noted, "rather than emphasizing characteristics of the final products, process-oriented instruction focuses on the language and problem-solving strategies that students need to learn in order to generate those products" (p. 5). Constructivism allows for metacognitive reflection, which is critical to foster new knowledge (Brooks & Brooks, 1993, 1999; Resnick, 1989). When learners reflect and think about their thinking, they are internalizing the learning process.

There are, however, critics of constructivism as an educational approach (Brooks & Brooks, 1993). For example, Kirschner et al. (2006) indicated that minimally guided approaches as practiced through constructivist approaches ignore empirical studies demonstrating instructions that are unguided are not effective in learning environments. High-level thinking skills, such as problem-solving and analysis, may seem too abstract and difficult for students with learning differences; however, with additional guidance and preparation, it is possible to foster these skills for all students (Ellis, 1997; Grobecker, 1999).

Fundamental to the constructivist approach is a focus on key ideas and the relationships of ideas within and across subject areas (Grobecker, 1999; Ellis, 1997). When applying this

principle, teachers stress connections as well as key concepts and ideas rather than isolated bits of knowledge. In fact, Pintrich & Schrauben (1992) argued that student learning in the classroom can best be exhibited by their motivational and cognitive factors, which are affected by the nature of the instructional methods and academic tasks.

With a modified instructional approach, constructivism can offer an effective learning process for students with special needs due to its emphasis on sensory input. Students on the autism spectrum, however, may struggle to form relationships and work collaboratively. Driscoll (2005) noted a lack of attention to student behavior and entry skills as a requirement over higher-order goals that caused some students to lose focus on learning objectives. To this end, explicit strategies have been identified that support individual and social learning, such as anchored instruction, situated learning, and cognitive apprenticeship that draw from constructivist theories. Anchored instruction involves lodging instruction in an authentic problem-based story, case study, or situation in which students generate and test possible problem solutions while situated learning emphasizes learning through social interaction and collaboration in authentic contexts. And cognitive apprenticeship, like any traditional apprenticeship, relies on pairing a guide or an expert with a learner in an authentic study but focuses on making thinking explicit (Lowenthal, P., & Muth, R. 2008). Students, ultimately, transfer knowledge to other applications, which is vital to the learning process.

Contrary to the constructivist point-of-view, objectivists believe that knowledge is external and independent from the learner (Duffy & Jonassen, 1992). Objectivists presume there is one precise way of performing tasks that the teacher identifies in advance and models. Objectivists argue that constructivism is overly permissive, causing teachers to follow the

interests of students while disregarding the curriculum. Battista (1999) argued that constructivism lacks rigor.

Constructivist Teachers in the Classroom

Constructivist teachers create a context for student learning and establish learning practices in the classroom (Jaworski, 1991). In a constructivist classroom, the teacher fosters imagination and inquiry while stimulating engagement and active involvement rather than providing knowledge (Hmelo-Silver, Duncan, & Chinn, 2007). The instructor creates a learning atmosphere with minimal supervision and introduces opportunities for students to interpret and apply new knowledge. Constructivist teachers are constructivist learners themselves and understand the theory of constructivism, strategies, and techniques that combine social and cognitive learning methods. Teachers must complete professional development in which they experience activities that lead them to new actions in their classrooms (Hoover, 1996). Understanding the conceptual framework of constructivism is essential to its implementation.

Constructivist pedagogy includes teacher involvement in the social environment of the classroom and in the creation of activities grounded in constructivist theory (Richardson, 1997). According to Lester and Onore (1990), in order for teachers to truly become constructivist, they must shift their thinking. Brooks and Brooks (1993) suggested five guiding constructivist approaches: (a) pose problems of emerging relevance to students; (b) structure learning around primary concepts; (c) seek and value students' points of view; (d) adapt instruction to address student suppositions; and (e) assess student learning in the context of teaching. Constructivist design principles require understanding alternative views (Bednar, Cunningham, Duffy, & Perry, 1991). Knowing what students think about concepts helps teachers to differentiate instruction; when educators permit students to construct knowledge that challenges their current

assumptions, learning occurs (Bednar et al.,1991). Constructivist teachers structure lessons around big ideas, tailor lessons, and create situations that allow students to socially construct new knowledge (Reigeluth & Curtis, 1987). Guidelines for lesson planning identified by Windschitl (2002) include: (a) teacher awareness of student's prior knowledge of ideas, (b) clearly defined conceptual goals, (c) teaching strategies that challenge initial ideas, (d) plans that offer opportunities to utilize new ideas, and (e) a classroom environment that encourages students to propose and discuss ideas.

One way that teachers can facilitate student growth is by using student interests to guide instruction. Zhan (2008) proposes that through collaborative learning activities, students are engaged through interaction and participation by working together toward a common academic goal, an activity that increases their levels of satisfaction and feelings of connection and community. Constructivist teaching requires moving from a lecture model to a model of inquiry where the instructor poses questions and guides students through active methods of investigation and data to discover information in order to support their investigations. Windschitl (2002) notes that one of the main problems in implementing a constructivist approach in a classroom is that most teachers were educated using a different approach, and, as a result, do not have the conceptual experience to model in their classrooms. A common misconception made by teachers is that hands-on activities are synonymous with a constructivist activity (Alesandrini & Larson, 2002).

Research has demonstrated that people are limited in their ability to retain ideas and knowledge when they learn in decontextualized environments (Davis, Sumara & Luce-Kapler, 2000, 2008). Therefore, procedures and isolated facts that are learned as repetitive drills eventually lose their meaning and are discarded. "Constructivist frameworks challenge teachers

to create innovative environments in which they and their students are encouraged to think and explore" (Gould, 1996, p. 92). Teaching and learning using a constructivist model requires teachers to create long-term goals, an authentic learning environment, and materials that are of interest to students (Gould, 1996).

Teachers work with students to develop and refine big ideas by asking learners critical questions (Fosnot, 2005). The learning culture affects student development and is an important aspect for educators to consider when formulating lessons and organizing the classroom. As learners struggle to make meaning, structural shifts occur and "big ideas" are created (Schifter & Fosnot, 1993). These "big ideas" are self-constructed central organizing principles that learners can generalize across experiences.

Approaches to Constructivism

There are many approaches to teaching and learning in a constructivist classroom, but there are four guiding principles that apply to Vygotsky's theory: (a) learning is a social, collaborative activity; (b) the zone of proximal development (ZPD) is a guide for curricular and lesson planning; (c) school learning should occur in a meaningful context and (d) out-of-school experiences should be related to the child's school experience (Maddux, Johnson, & Willis, 1997). Tailoring students' learning styles to their personal understanding is integral to the constructivist learning theory (Brooks & Brooks, 1999). "Knowledge is not passively received, it is actively built up by the cognizing subject. That is, as much as we would like to, we cannot put ideas in students' heads, they will and must construct their own meanings" (Wheatley, 1991, p. 10).

Constructivism supports students using learning models such as discovery learning and problem-based learning. Certain strategies and techniques (e.g., inquiry-based learning, project-

based learning, scaffolded instruction, and reciprocal teaching) promote student growth. Constructivist strategies for learning depend on teachers establishing an educational objective and engaging students in meaningful activities.

The Socratic Method

The Socratic method is a line of pedagogical inquiry centering around the ability of students to gain access to information through a line of questioning techniques facilitated by a teacher and peers. This is a student-centered approach that challenges and engages students in analytical discussion and aids in expanding critical thinking skills. This process of discovery builds upon learners' own knowledge through dialogue with teachers and peers. The goal of the Socratic method is to help students analyze their beliefs and any new information they encounter while helping them to develop a sense of curiosity and sensitivity toward new information, all leading to a habit of inquiry and robust thinking (Resnick 1987).

Inquiry-Based Learning

Inquiry-based learning is a crucial element of constructivist learning developed during the 1960s in which learners discover facts and relationships for themselves (Bruner, 1967). This form of active learning helps students develop experimental and analytical skills. Inquiry-based learning is a student-directed approach; however, some structure is necessary. Like Dewey (1916) and Bruner (1996), many constructivists believe that direct instruction cannot be effective by itself; instead, educators should develop students' interests by asking questions and discovering things about them. It is integral that the facilitator has a clear understanding of students' knowledge levels and skills.

The connection between inquiry and experimentation links the learner's ability to make connections to past knowledge and the current issue. The basic principle is discovery: "[T]o

understand is to discover, or reconstruct by rediscovery and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simply repetition" (Piaget, 1973, p. 20).

Students are more likely to remember concepts and knowledge that they discovered on their own (Bruner, 1967). When students interact, engage in problem-solving, and execute experiments in situations of exploration, they often recall what they learned. Students engaged in inquiry go beyond information teachers provide and engage in a process of discovery. "Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving" (Bruner, 1961, p. 26). Facilitators guide students in inquiry-based learning as they advance to more complex tasks. Teachers must prepare, however, for students who lack knowledge. Inquiry-based learning methods share some of the same problems as discovery learning, so inquiry must be carefully planned and organized, especially for the less prepared students who may lack the background knowledge and problem-solving skills they need to benefit (Woolfolk, 2004, p. 332).

Project-Based Learning

Project-based learning (PBL) allows students to carry out complex tasks in rich and meaningful contexts. This approach promotes inquiry, self-assessment, reflection, and collaboration, which are essential to critical thinking and problem-solving (Resnick, 1989). Students engage in a community of scholars to learn through inquiry rather than through a series of disconnected activities (Resnick, 1989). PBL is a hands-on, minds-on, experiential approach that links interaction and experience in fostering coherent, coordinated, and meaningful transactions (Dewey, 1938). Through PBL, students gain a deeper understanding of concepts in an integrated manner and become critical thinkers through active involvement in the learning

process. They also engage in authentic tasks rather than merely engaging in repetitive tasks. Students have some choice in the project they will work on and co-construct criteria for the assessment of the project. One of the implications of constructivism in a PBL setting is that, while adopting the PBL approach, instructors should be involved in designing and developing the instructional strategies. This planning includes analyzing students' needs, identifying the objective of the lesson, developing teaching materials, and designing assessment methods.

Scaffolding Instruction

The theoretical origin of scaffolding is Vygotsky's (1978) work on the zone of proximal development or ZPD. Schunk (2004) defined instructional scaffolding as a process that extends the learner's knowledge and task management while functioning as a tool for supporting learners. Scaffolding is an essential element of constructivist teaching and learning. The ZPD is the "distance" between the student's current intellectual level of understanding and level that closely estimates the learner's potential (Vygotsky, 1978). Students build on prior knowledge and create new meaning when they are engaged in PBL. Scaffolding frequently supports PBL, which allows teachers to facilitate student understanding by providing a temporary framework for learning. Learners receive support until they can independently apply new skills and strategies (Rosenshine & Meister, 1992).

There are different ways to scaffold instruction for students. According to Bransford, Brown, and Cocking (2000), educators favor an apprenticeship model in which an expert demonstrates an activity while providing students with advice and examples. Students practice and the teacher reduces support until they independently perform the task (Bransford et al., 2000). Scaffolds are "concrete prompts specific to the strategy being taught and are used in order

to bridge the gap for students. They are general enough to allow the application of a variety of different contexts" (Rosenshine & Meister, 1992, p. 27).

There are many different scaffolding combinations and tools that either include tutors or the use of technology to help learners gain a deeper understanding than they would if working independently. Students develop new ways of sharing knowledge through dialogic interactions with teachers or small groups of students. Technology is increasingly serving a variety of purposes for the application of constructivist principles to learning. For example, software can be used in constructivist ways whereby students can design and create artwork, explore simulations, problem-solve in multimedia presentations, experiment in virtual worlds, and investigate web sites. These complex, collaborative, and authentic projects challenge the ways in which students learn and understand (Murphy, 1997).

The use of natural dialogue between children and adults outside the classroom should promote learning in school, as well (Palincsar and Brown,1994). Fostering dialogue among students is a way to encourage collaborative problem-solving. This process helps students build comprehension skills through literacy-building in large and small group sessions and improve students' problem-solving of difficult tasks (Palincsar & Brown, 1994). Scaffolding techniques reduce cognitive load (limited working memory), provide expert guidance, and increase the ability of students to acquire structured ways of thinking, acting, and learning (Hmelo-Silver et al., 2007).

Students construct knowledge when they engage in activities without predetermined outcomes. Cunningham notes that

> [t]he role of instruction in the constructivist view is to show students how to construct knowledge, to promote collaboration with others in order to show the

> multiple perspectives that can be brought to bear on a particular problem, and to arrive at self-chosen positions to which they can commit themselves, while realizing the basis of other views with which they may disagree (1991, p. 14).

When a learner is supported and guided by someone more knowledgeable, the learner works, to a certain extent, beyond their current level (Rodgers, 2004). Supporting the learner through scaffolding must begin with what is familiar to the student and build to concepts furthest from their experience. The ZPD involves all constituents in supporting the student as a learner (Vygotsky, 1978). Building knowledge in a community of learners is an integral part of the process.

Vygotsky's (1978) model demonstrates how students move from stage one (i.e., relying on teacher and peer support) to more explicit and guided instruction in stages two and three. In stage four, students internalize information (i.e., automatization) and gain independence. As students progress, teachers decrease supports so students take on more responsibility for their learning. If teachers remove scaffolds too rapidly, however, learning does not occur and the student can become frustrated (Dixon, Carnine, & Kameenui, 1993). Teachers must observe learners closely to determine exactly how they learn and what they know. Rosenshine and Meister (1992) agreed that scaffolding supports higher order thinking skills for students with higher level as well as lower level skills and abilities, and he proposed that teaching higher order thinking skills in the areas of comprehension, the scientific process, and mathematical problem-solving help students achieve at higher levels. Rosenshine and Meister (1992) noted, however, that students often fail due to inadequate instruction. Scaffolds help bridge the gap in abilities that students experience (Rosenshine & Meister, 1992).

Reciprocal Teaching

Palincsar and Brown (1984) developed the theory of reciprocal teaching based on Vygotsky's (1978) theory of scaffolding instruction in the classroom. Teachers begin the process by modeling techniques for students then allowing them to take on more responsibility as they begin to feel less risk in clearing up misconceptions through dialogue (Palincsar & Brown, 1984). The social nature of collaboration in constructing meaning allows students to focus on information gathering in meaningful contexts. Certain conditions, however, are necessary to promote collaboration among groups (Palincsar & Brown, 1998). Group members must work on similar concepts of the same type, for example. Reciprocal teaching also requires more classroom time than traditional teaching methods require, as assessment can be more labor intensive as instructors question students about their knowledge and meta-cognition in one-on-one interviews.

Classroom Conditions for Learning

Environment affects student engagement in inquiry and learning. Constructivist classrooms allow students to feel comfortable sharing their ideas because teachers value all contributions (Shapiro, 2002). Constructivist classrooms immerse students in experiences that engage them in meaning-making inquiry, action, and personal reflection. Students may work in small groups or individually. Activities are student-centered and interactive; students explore new ideas and experiences (Langer & Applebee, 1987). Teachers recognize how students use personal experiences, prior knowledge, perceptions, and their physical and interpersonal environments to construct knowledge and meaning. The goal in a constructivist classroom is to produce a democratic classroom environment that provides meaningful learning experiences for autonomous learners so that students co-construct meaning. For example, students may read

accounts of the effects of social or educational policies or they may choose to read the actual reports and generate their own inferences about them (Brooks & Brooks, 1993).

Constructivist classrooms are generally more informal in order to promote a close working relationship between teachers and students. Students should have room to explore and access resources (e.g., books, electronic search tools) with coaching support during learning activities (Wilson, 1998). Students should also have opportunities to examine case studies or undertake long-term projects.

Jonassen (1994) proposed eight characteristics of constructivist learning environments: (a) provide multiple representations of reality; (b) avoid oversimplification; (c) represent the complexity of the real world; (d) emphasize knowledge construction, not knowledge reproduction; (e) emphasize authentic tasks in a meaningful context; (f) provide learning environments with real-world settings or case-based learning; (g) encourage thoughtful reflection on experience; and (h) support "collaborative construction of knowledge through social negotiation versus competition among learners just for recognition" (p. 11-12). As well, teachers assess students' assignments through rubrics or written criteria that is available for students to review. These rubrics guide students by clearly defining tasks that students need to achieve in content areas and are designed for group, team, and individual learning.

In terms of assessment, constructivism can eliminate the need for a traditional grading system as well as the standardized testing system. Assessments can be made continuously in the constructivist classroom and potentially function as more formative in nature (Gregory, 2002). The use of checklists, project progress, collaborative work groups, self-assessment, journals and portfolios are useful in assessing student knowledge and understanding.

Implications for School Leaders

It is critical to the success of constructivist approaches that school principals support and guide teachers in constructivist practices. School leaders must be knowledgeable about constructivist practices in order to provide teachers with effective strategies and to support their practice. According to Schmoker (1996), "[s]chools improve when purposes and efforts unite" (p.26). The principal influences change in the culture of learning and guides the shift in teaching necessary for attaining 21st century learning goals. Sergiovanni (1992) stated, "In communities, leadership and learning go together, so does leadership and sense-making" (p. 40-41).

Lambert (1998) defined leadership as constructivist learning and emphasized the idea that leadership means learning together to collectively construct meaning and knowledge. Inquiring and generating ideas together, reflecting upon and making sense of work in the light of shared beliefs and new information, and creating actions that grow out of these new understandings all supply the foundation for the core of leadership (Lambert, 1998, p. 5-6). Educational leaders must have the knowledge, skills, and dispositions to build leadership capacities in others while creating learning communities that are exciting, caring places to teach and learn (Lambert, L., Walker, D., Zimmerman, D., Cooper, E., Lambert, M., Gardner, J., & Szabo, M., 2002). Constructivist leaders must also challenge current ways of thinking and align their leadership behavior, goals, and school practice with new approaches (Lambert et al., 2002).

Sound school cultures correlate strongly with increased student achievement and motivation as well as with teacher productivity and satisfaction. Before attempting to change a school's culture, however, leaders must consider and understand the existing culture. Relationships are at the very core of a school's stability (Stolp & Stuart 1994). A vision for creating a healthy school culture should be a collaborative activity among stakeholders e.g.,

teachers, students, parents, staff, and the principal. Fullan & Hargreaves (1992) suggests that principals "are blinded by their own vision when they must manipulate the teachers and the school culture to conform to it" (p.19). A more useful approach is to create a shared vision that allows for a collaborative school culture.

According to Senge (1990), organizations must have leaders who facilitate its members' learning. Teachers and students should learn together within a professional community, engage in inquiry-based learning, and reflect to expand learning opportunities. According to Fullan (2001), discourse between groups is essential to achieving organizational change by working toward a common goal. Constructivist practices must include a community approach to teaching and learning. The principal builds sustainability by enhancing teacher professional development and creating a community of teachers with strong professional relationships (Goleman, Boyatzis, & McKee, 2002). Moreover, strong leadership is required to foster a culture of collaboration and cohesion in order to develop effective communication to stakeholders and communities that ensures the feasibility of any education program. Program success depends on strong leadership ensuring that the elements are executed in an efficient, timely, and effective manner (Malone, N., et al, 2014).

Leadership theory in the 1960s foretold constructivist perspective studies by affirming that a leader's implicit view of human nature determined both style and effectiveness (McGregor, 1966). According to Manna (2015), principals are multipliers of effective teaching practices. The ability to think creatively, involve others in the process, provide opportunities for learning, while proving support for faculty development is key to development (Lunenburg, 2011).

Conclusion

This chapter examined existing theoretical and historical research on approaches to constructivism and constructivist approaches to teaching and learning in schools. This chapter also examined learning theories and how they relate to constructivist approaches as well as the theories of cultural, developmental, and social constructs of learning. Finally, this chapter explored school leadership in relation to student success. Chapter Three details the methods and procedures used to conduct the study.

CHAPTER THREE: DESIGN OF THE STUDY

Introduction

The purpose of this study was to examine the perceptions of elementary principals regarding their roles in promoting constructivist approaches to teaching and learning. The following three questions guided this qualitative phenomenological study:

RQ1. To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?

RQ2. How do principals report they help teachers implement constructivist teaching and learning?

RQ3. What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

This chapter includes a discussion of the design of the study and provides a rationale for the research design selected. A detailed description of the participants and setting as well as an explanation of the steps taken to limit the scope of the study is provided. The development of the instrumentation used in conducting the study is described, and the data collection and organization procedures are outlined. Data and analysis procedures including the tools and software used to analyze the data both manual and computational approaches and coding procedures are also described in detail. Issues of trustworthiness regarding the measures taken to enhance the credibility of the study are discussed. The chapter concludes with a comprehensive summary of the chapter.

Overview of the Research Design

A phenomenological approach was used in this study to understand and document the experiences of the participants. This approach aimed to develop a complete and accurate understanding of the human experience or experiential moment from the participants' perspectives (Merriam, 2009). The researcher's role required an examination and disclosure of the researcher's experiences and feelings about the phenomenon as well as the employment of a technique of phenomenological epoché or bracketing, a systematic procedure that involves steps to set aside various assumptions and beliefs about a phenomenon while examining how the phenomenon presents itself in order to ensure an unbiased course of questioning (Moustakas, 1994). This chapter includes an identification and explanation of the researcher's steps for participant recruitment, research instrument development, and data collection and analysis.

Research Method Rationale

In this qualitative study, the researcher used a phenomenological approach to examine elementary school principals' perspectives of constructivist approaches to teaching and learning. Creswell (2007) noted that qualitative research is appropriate when there is little information on a topic and the researcher is unsure what to expect. A phenomenological study design allows the researcher to develop a deeper understanding of the phenomenon through the lived experiences of the participants (Creswell, 2014). Phenomenological inquiry builds a crucial understanding of the significance and philosophy that people construct in their lives to make sense of the world.

Experience and behavior (i.e., the relationship between a phenomenon and the person experiencing the phenomena) are inseparable "because all knowledge and experience are connected to phenomena, things in consciousness that appear in the surrounding world, inevitably a unity must exist between ourselves as knowers and the things or objects that we

come to know or depend upon" (Moustakas, 1994, p. 44). In this study, the researcher sought to provide a better understanding of a phenomenon by increasing understanding of the knowledge and experiences surrounding it.

There are strong connections between phenomenology and constructivism (Armezzani, Chiari, & Nuzzo, 2014). In this phenomenological study, the researcher explored connections between principals' perceptions and their roles in implementing constructivist approaches to teaching and learning. In order to achieve these connections, the researcher recruited participants and asked them to complete two tasks: (a) an online survey and (b) a one-on-one interview as a follow-up to the survey. The researcher recruited survey respondents through an initial email that introduced the study and included a link to the online survey. The researcher initially emailed 185 elementary Kindergarten through Grade 6 principals selected randomly throughout public school districts in Massachusetts. The researcher sent a second survey request approximately two weeks after the initial request in an effort to solicit additional responses, which was then followed by a second request to conduct an interview as a follow up to the survey. At the end of the survey link, participants provided their contact information and volunteered for interviews.

The researcher informed all participants of the study focus, methods, and assurances of anonymity. The first page of the online survey included a required check box for participants who agreed to participate in the survey. All interviewees read and signed an informed consent statement prior to the face-to-face interviews. The researcher also informed participants pseudonyms would protect their identities. The study met all human subjects research and Internal Review Board (IRB) requirements at the university. Principals who answered affirmatively regarding constructivist approaches in their schools were selected. Face-to-face interviews were scheduled with qualifying participants.

Participants and Setting

The researcher conducted the study in districts of varying demographics and sizes in Massachusetts. All schools were elementary schools serving K-6 students. All participants were elementary principals who promoted constructivist approaches to teaching and learning and had some professional development experience in constructivism.

The researcher utilized purposeful selection of participants based on their experiences implementing constructivist approaches to teaching and learning as determined by responses to the Survey Monkey questionnaire they completed. The criteria for selection of participants included principals currently working in an elementary school setting who were licensed. Differences among participants included age, race, length of experience, grade level, and level of education or degrees completed.

Sixteen principals replied and 12 principals participated in the follow-up interviews. The interviews were conducted at each individual principal's school. These locations were intentional and provided both convenience for the principal and a sense of comfort due to familiarity with the surroundings. The location provided the researcher with a sense of the culture of the school.

Instrumentation

The instruments for this study consisted of a survey (Appendix B) and an in-depth face-to-face interview protocol (Appendix F). The online survey gathered information regarding principals' perceptions of constructivist approaches as they pertain to their individual school cultures. The researcher distributed the online survey using a Survey Monkey link inserted in the introductory email. The questions explored the extent to which professional development was offered to principals and the areas in which teachers received support from the principal, the district, or outside professional development.

There were five open-response questions in the survey and 18 multiple-choice questions. The last question asked respondents if they would be willing to participate in a face-to-face interview. The multiple-choice questions gathered a variety of data regarding constructivism and demographic information about respondents' schools and teaching approaches. The correlation between the research questions and interview and survey questions is shown in Table 1.

Table 1

Correlation Between Guided Research Questions and Interview and Survey Questions

GRQ1	Interview Questions	#1	#11	------	-------	-------	-------	------
	Survey Questions	#8	#13	#16	#17	#18	#19	#21
GRQ2	Interview Questions	#2	#5	#6	#9	#10	-------	------
	Survey Questions	#9	#10	#11	# 12	#14	#15	#20
GRQ3	Interview Questions	#3	#4	#7	#8	-------	-------	-------
	Survey Questions	#13	#22	#23	-------	-------	-------	------

Note. See Appendix: B for survey questionnaire for principals and Appendix F for the in-depth interview questionnaire.

Data Collection Methods

In order to mitigate bias, the researcher employed the use of triangulation. Triangulation provided more breadth and depth to the study and reduced the likelihood of any misinterpretation through the use of multiple sources of data (Creswell, 2007). The researcher provided participants with a description of the study in the invitation to participate (Appendix A) and a link to the questionnaire (Appendix B). The researcher emailed and called respondents to schedule interviews with 12 principals between May and September 2018. Random sampling was used to select participants for phase one and purposeful sampling was used for phase two.

Based on questionnaire responses, the researcher determined participant eligibility. Within a week of completing the online survey, participants received a request to schedule a face-to-face follow-up interview. During the interview, the researcher recorded the face-to-face interviews with participants' permission and took detailed notes during the process. Recording allowed the researcher to take field notes without missing relevant information while the participant was speaking.

The researcher kept all data on a personal laptop that only the researcher could access. Throughout the process, data was collected and analyzed using themes that surfaced during the questioning and interview process. The researcher collected data from the questionnaire using NVivo software and downloaded raw data for analysis using identification numbers to corresponding responses.

Data Analysis Methods

Data were analyzed using the six-step protocol for thematic analysis proposed by Braun, Clarke, and Terry (2014). The first step of analysis involved reading and re-reading the questions and the transcripts and to determine potential points of analytical interest. The second step involved using key descriptive phrases to code the dataset. In the third step, like codes were grouped into larger themes through the identification of larger patterns in the interview transcripts. The fourth step involved reviewing themes to identify relationships and organize the analysis, and the fifth step involved engaging in detailed analysis of the data in each theme to refine categories and their organization. Lastly, a final refinement of the analysis was completed.

The researcher coded, entered, and transcribed data during data collection (Creswell, 2014; Miles, Huberman. 2014). Coding occurred as data was being collected and transcribed

(Creswell, 2014; Miles et al., Saldana, 2011). The researcher collected, managed, and stored data using NVivo, a computer-assisted qualitative data analysis software (CAQDAS). The researcher examined and revised code definitions to ensure they reflected the most complete implication of each code.

The interview transcripts were read several times to gain an overall insight of the meaning of the data. The researcher completed analyses in several rounds for each piece of datum. Once the data were sorted among the three research questions, coding began. All data were sorted into types using the source of the data (i.e. survey, interview transcripts, use of a numerical identifier, pseudonyms). A second round of descriptive coding located any additional themes or descriptors. Within each round of coding, the researcher prepared analytical memos to summarize thoughts that emerged. Additionally, codes were reorganized to uncover overall patterns and themes within the data, then sorted into larger categories to create a hierarchy of codes reflecting the major themes of the analysis. The remaining codes fell into subcategories. During this code organization process, analytical memos were made to summarize thoughts on each stage of the analysis. A description of the experiences of participants began to emerge. Chapter Four expands further on the analysis and experiences of the phenomenon. After identifying themes, the researcher translated those themes into findings for each of the guiding research questions. The survey data analysis and write up of the findings took place concurrently with conducting the interviews.

Issues of Trustworthiness

To ensure unbiased and precise results, the researcher remained vigilant in managing any bias her own personal and professional experience and perspective might create. To establish credibility, the researcher used thick, rich description to explain the setting, participants, and

themes of this qualitative study. According to Denzin (1989), "thick descriptions are deep, dense, detailed accounts" while "thin descriptions, by contrast, lack detail, and simply report facts" (p. 83). The researcher also used a peer to compare coding. Adherence to Creswell's (2014) qualitative codebook ensured that definitions of codes were consistent throughout the study.

Finally, the researcher used member checking in which participants reviewed the researcher's interpretations of their data for validity and reliability. According to Lincoln and Guba (1985), member checks are "the most crucial technique for establishing credibility" in a study (p. 314). After identifying themes within the data sets, the researcher then translated them into findings for each of the guiding research questions. Those themes were then translated into findings for each of the guided research questions.

Delimitations and Limitations

The delimitations of this study include the location of the population that participated (i.e., Massachusetts elementary schools). Also, the researcher developed the data collection tools specifically for this study to only address the goals of this research endeavor and did not intend to measure student progress.

The study sample was limited to Kindergarten through Grade 6 principals in the state of Massachusetts. There was no limitation, however, on the location of elementary schools (e.g., urban, rural, suburban). The researcher sought elementary schools that included a range of socioeconomic and ethnic populations as well as a range of performance outcomes and goals. Other than being a public elementary school in Massachusetts, there were no restrictions on the type of elementary school principal allowed to participate.

Summary

The purpose of this chapter was to provide a comprehensive overview of the study design and rationale. The chapter began with an introduction of the purpose of the study and descriptions of instruments, data collection, and data analysis. This chapter also included details of the researcher's approach to ensuring trustworthiness, validity, and reliability of the research findings and the delimitations of the study. The use of software-collected data as well as the connection between the guiding questions and confidentiality and anonymity for the participants were also discussed. Next, the use of software in data analysis, coding procedures, and the connection of the codes to the guiding questions were described. This chapter also detailed procedures consistent with phenomenological studies and the process of analysis included for these studies; recording, analysis, and the use of CAQDAS in the coding process. The findings of the data from this chapter will be reported in Chapter Four.

CHAPTER FOUR: FINDINGS

Introduction

This chapter includes data from questionnaires completed by 16 elementary principals as well as information gathered in face-to-face semi-structured interviews with 12 elementary principals. Included is an analysis of the data, emergent themes, and findings for each of the following guiding research questions:

> GRQ #1. To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?
>
> GRQ #2. How do principals report they help teachers implement constructivist teaching and learning?
>
> GRQ #3. What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

These questions form a framework for organizing the data and findings in this chapter. The data for each question appears along with an explanation of each finding related to that research question. Twenty-four questions on a four-point Likert rating scaled questionnaire and 11 follow-up interview questions were developed to help answer the three GRQs. The four-point Likert scale choices range from 1 (strongly disagree) to 4 (strongly agree).

Guiding Research Question One

To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?

Constructivism and Teaching and Learning

Principals responded to an online survey and completed interviews to share their experiences, accomplishments, and challenges in implementing a constructivist approach. The relevant interview questions were 1 and 11, and the relevant survey questions were 8, 13, 16, 17, 18, 19, and 21.

For Question 8, 11 participants of the 16 (68.75%) strongly agreed that constructivist pedagogy was important to improving teaching and learning in their schools, four participants (25%) agreed, and one respondent (6.25%) strongly disagreed. The weighted average on the four-point scale for Question 8 was 3.6.

In general, the participants all agreed that principals had a fundamental role in developing the capacity of teachers to successfully engage students in learning and that constructivism was essential in supporting students' critical thinking and problem-solving skills. Engaging students in the learning process increases their attention and focus while promoting meaningful learning experiences. In order for all students to develop the critical thinking and problem solving skills necessary to compete with their peers in the 21st century global world, they concluded it is incumbent on principals to provide teachers with the approaches, techniques, and skills needed to teach students.

Commonalities among participants were found in creating environments where students felt free to take risks, to express themselves, and to collaborate during problem-solving activities. All interview participants viewed teacher collaboration as essential in this process. Building a sense of community by fostering collaboration also helped to build relationships among teachers, which contributed to the further development of strategies that promoted student success.

Participant 10, for example, noted that through teacher collaboration, staff were able to design constructivist activities in which students became actively engaged in authentic learning tasks.

Participants also discussed how teachers integrated strategies and techniques into the curriculum. For example, Participant 8 observed that it was less of an instructional approach and more about asking the students the right questions and helping them to use critical thinking and problem-solving skills:

> I do think it's critical especially here because we're a STEAM school and so, we have integrated science, technology, engineering, arts and math across the curriculum and what makes a STEAM education a constructivist education is applying the engineering design process, because kids have to identify a problem, they have voice and agency in that.

Irrespective of the content being studied, critical thinking and problem-solving skills supported students in anchoring their learning and solidifying their understanding of the subject matter, according to many of the principals interviewed. These skills allowed students to go beyond the content and apply their learning to real-world applications. Therefore, it makes sense that experiential learning is significant in the context of the subject being studied. For learning to be useful, participants noted that students need to place their new understanding in a context that is relevant to them. If they cannot see how learning is useful to them, then it is likely new knowledge will be forgotten quickly. Participant 6 noted that "[t]he more they do, the more they learn. To me it's one of the most important things. Everything is hands-on, writing, everything!"

Each participant's experience informed the intricacies and characteristics within their schools. Training, budgets, and culture determined the extent to which each school participated

in constructivism. The one factor that remained constant, however, was that participants agreed it was critical for students to understand the "why" when seeking out new knowledge. During interviews, the significance of implementing constructivism as well as the level in which participants believed in it was emphasized. The consensus was that constructivism was an integral approach that allowed students to make meaning of what they were learning rather than just taking in information and regurgitating it. The study data showed that 93.75% of participants believed that implementing constructivism was important to the achievement of their students.

Constructivist approaches were significant, as well, in fostering a community of learners that were not dependent entirely on the teacher. According to one participant, "the student […] constructs knowledge themselves. So, I kind of look at it as how I believe cognition happens, not just pedagogical, you know we use it to design but it's how people learn."

Teachers as Facilitators

With respect to their agreement with the Question 13 statement that "[t]eachers guide students as facilitators in the learning process rather than using an overt means of delivering information to all students, three out of 16 participants (18.5 %) strongly agreed, 12 participants (75 %) agreed, and one participant (6. 25%) disagreed. The weighted average on the four-point scale for question 13 was 3.13.

Interview participants reported that constructivism encourages a wider array of students to participate in the learning process. Participants noted that all grade levels were involved in constructivist approaches in classrooms at various stages and levels of developmental appropriateness through both large and small-group configurations. Students benefitted through a student-centered approach and discovery learning rather than overt teaching of facts.

Participant 6 described how a Kindergarten teacher used an independent discovery play format as an opportunity to see what the student knew and how the student was able to learn on their own:

> A kindergarten teacher, she did a very nice job. She talked about play versus meaningful play, which meaningful play then becomes about maker spaces, which then becomes your child becoming an entrepreneur and solving a world problem.

Participants noted, also, that the philosophy of constructivism supports meeting the goals and values of their schools through shared personal experiences and knowledge. In order to construct their own learning, one participant offered:

> Walk around this building on any given day. So, I went into a math lesson and kids were struggling with multiplying decimals by 10. So, she had them standing up there with numbers and they were actually moving as she would multiply by 10.

One interview with Participant 8 revealed that in their school, constructivist approaches were utilized in classrooms during math, music, and science labs. For example, teachers built a replica of soil erosion in the lab and students were placed in groups so that each group could then demonstrate how water eroded the earth's surface. Throughout this interview, this principal consistently expressed the value of an inclusive quality regarding teachers and students and spoke to the nature of the culture of the school community. Participant 8 noted their investment in pursuing constructivist techniques and strategies that supported teachers and students:

> [Whether it's] field studies, going out to the nature trail, going to a maker space, there are so many things that I see every day, but I don't think there's any one

> time I haven't seen a teacher really use a scale that isn't a constructivist approach. It's just, all over this building. But again, they're safe, they can take a risk.

Constructivist Practice in the Classroom

In response to the statement, "I monitor teachers to ensure that constructivist pedagogy is implemented with fidelity in my school," 15 principals responded. Three participants (20.00 %) strongly agreed, 11 (73.33%) agreed, and one participant (6.67%) disagreed. The weighted average for Question 17 was 3.13. In response to the related statement, "I have participated in professional development opportunities to improve my knowledge and skills of constructivist pedagogy" in Question 19, three (18.75%) out of 16 participants stated that they had often participated in professional development opportunities while 10 participants (62.50%) sometimes participated, two participants (12.50%) stated they rarely participated, and one participant (6.25%) stated that they never participated in professional development opportunities. The weighted average for Question 19 was 2.94.

The majority of participants (81.25%) noted that they had enlisted in some form of professional development during the school year. When investigating further as to how often and what type of PD principals participated in, they admitted that training wasn't always connected to the goals of the school due to district mandates. In fact, in most cases, participants reported funding their own PD. Participant (8) explained that

> PD is being totally teacher-driven, you know, I think it is important. You see when we go around and do our walkthroughs, here in town, we do educational rounds. That's been a big topic over the past few years, you know teacher-centered versus student-centered. I would say they are much more constructivist.

Participants indicated that they valued critical thinking and problem-solving skills by explaining that when other students learn and apply these processes, all students benefit. Students were able to think through problems and benefit from exposure to how other individuals process information. In interviews, participants often used specific references that pointed to the successful implementation of constructivist approaches in their schools, such as creating environments where students felt challenged while gaining knowledge. Participants discussed strategies that helped drive students to achieve higher levels of thinking and learning, noting that these strategies are an integral part of fostering critical thinking skills and forging independent learning.

Similarly, principals shared that creating an environment where students felt free to take risks was important to their willingness to express themselves and exchange ideas during problem-solving. Students were guided by their teachers while they took ownership of their learning and actively constructed new knowledge. The importance of teachers creating engaging activities designed to improve students' critical thinking was commonly articulated. Participant 11 noted that "they've got to have the conceptual knowledge of anything they do to be critical thinkers."

Interview data as well as responses to the survey questions were consistent when discussing and describing certain characteristics of classroom approaches. For example, all the grade levels were mentioned as having conducted some form of project-based learning throughout the curriculum. Participant 3 observed that the constructivist approach takes into consideration that students are reflecting on and processing information based on their prior knowledge in order to discover and construct their own understanding while assimilating prior experiences to actively construct new information.

Teachers were supported by their principals through classroom observations designed to enhance their pedagogy. A culture of collaboration was frequently encouraged through educational rounds and were facilitated by either a lead teacher, administrator, or an instructional coach. Participants noted that the primary purpose for conducting rounds was for observing teachers in order to compare their instructional practices with those of their peers. The benefit of this approach cultivated a discussion among observing teachers at the end of the observation as well as encouraged self-reflection on student-centered activities. These discussions supported teachers as practitioners in developing a common understanding of constructivist strategies. A discussion with Participant 8 revealed that students developed their own understanding of the topic they were studying without it being totally "teacher-driven," which the participant believed was an important factor in critical thinking.

The value of constructivist approaches was illustrated through numerous conversations with participants in which they described the benefits of creating an environment in which students felt free to express themselves during problem-solving, particularly during project-based learning situations. Participant 7 commented that

> some really neat ideas and some things that teachers are putting together, is exciting to watch because the level of engagement and interest of the students is really just skyrocketing. Not that it makes everything easy and sunshine and rainbows, but it's been a real benefit to the students', I think.

Engaging activities for students actively involved them in the learning process using critical thinking skills, which principals considered to be one of the most important components of classroom instruction. The participants primarily favored authentic assessment that was based on measuring learning that demonstrated meaning for the learner, as well. However, students

were still required to take part in district and state mandated assessments, which did not always align with the goals of the school. Participant 11 shared how they used authentic assessments in their building:

> Most of our assessments are done informally, done through the computer, hands-on activities, it's a matter of observations. Just, knowing your children what they know, what they don't know. As far as true assessments, we stay on project based. So, the ability to assess research projects, their writing. It's all assessed by the research projects that they create.

All participants noted that they encouraged some form of authentic assessment to determine how their students thought and understood what they were learning. As Participant 2 noted, "other schools use art and writing together in portfolio assessments of student work: um, it's more authentic work representation than it is portfolio assessment, we use kids work to sort of reflect their growth."

Ultimately, principals agreed that a combination of real-world experiences partnered with creativity is the quintessence of constructivism. Participant 8 summed up the value of performance-based assessment by sharing an example from the fourth-grade team. Over the last two years, their teachers involved the students in the reading of *The Lemonade War* followed by a simulation of details in the book performed out on the playground. The participant noted that the activity "demonstrates economics and competition" and that "it's also about how the real world works and what you have to do to market and advertise."

Guiding Research Question One Themes

Following is a summary of the themes and sub-categories that emerged as well as the findings from the analysis. Thirty-nine data units from 12 individual interviews were used to

indicate the extent to which elementary school principals consider constructivism to be critical to the improvement of teaching and learning. Data from the questions used to answer GRQ1 were grouped into 11 codes that established connections between constructivism and student-centered classrooms, critical to progression in the student thinking process, highly critical-10 out of 10, perpetual evolution in pushing higher order thinking, second critical focus on students, and teaching the teachers is critical as listed in the coding summary. Interview data revealed that principals' reflections demonstrated that they believed constructivism to be critical to the improvement of teaching and learning. Data also revealed similarities across themes regarding the critical nature of constructivism; many principals expressed a common theme about the essential nature of constructivism to the progression of critical thinking. Several principals described critical thinking as a continuous evolution that pushed higher order thinking. Most principals in this study reported that the critical nature of constructivism was the highest indicator of progression and stated that it made the most influence in student thinking. Table 2 below shows the distribution of data that demonstrates that principals strongly agreed that constructivist approaches helped students achieve higher levels of learning:

Table 2

Research Question One Themes and Codes

Theme (bold type and left-aligned) or code (italicized and indented)	Number of sources contributing to theme or code	Number of data units included in theme or code
Theme 1: evaluation of critical nature	12	24
connection between constructivism and student-centered classrooms	2	2

critical to progression in student thinking process	8	10
highly critical-10 of 10	3	3
perpetual evolution in pushing higher order thinking	3	5
second critical focus on students	1	1
teaching the teachers is critical	3	3
Theme 2: impact on student outcomes	8	14
data from HS matriculation	1	1
determining impact via formative assessments	2	2
higher level of awareness	3	3
higher outcomes in advanced HS Univ courses	1	1
successful student projects	6	7

Guiding Research Question One Findings

One finding emerged from Guiding Research Question One.

Finding #1

Principals believe constructivism has a profound influence on the critical thinking and problem-solving skills of students. According to the data, constructivist approaches proved to be integral in successfully matching school outcomes to school goals. Principals also agreed that the implementation of constructivist approaches further developed critical thinking and problem-

solving skills in students. By involving students in their own learning, students felt comfortable taking risks and were more likely to actively engage and work collaboratively to solve problems. Participants also reported that when teachers implemented constructivist approaches, environments were created in which students expressed themselves and felt challenged while engaging in problem-solving strategies. Techniques and strategies reportedly drove students to higher levels of thinking and learning and were an integral part of fostering critical thinking skills and independent learning.

Descriptions by principals provided insights into the significance that they assigned to constructivism as well as how students made sense of their ideas and were able to develop important critical thinking skills and problem-solving through dialogue and scaffolding.

Guiding Research Question Two

How do principals report they help teachers implement constructivist teaching and learning?

The goal of the second research question was to determine how principals helped teachers implement constructivist approaches in the classroom. Interview questions and survey items were designed to determine the strategies that principals used to support teachers in utilizing constructivist approaches to teaching and learning in the classroom. For Guiding Research Question Two, the relevant interview questions were 2, 5, 6, 9, and 10. The survey questions were 9, 10, 11, 12, 14, 15, and 20.

Supporting Student-centered Learning in the Classroom

In Question 9, principals described how they encouraged and supported teachers to practice student-centered learning in the classroom. Out of 16 respondents to the survey, 10 participants (62.5%) strongly agreed and 5 participants (31.25%) agreed that they supported and

encouraged teachers in their schools to practice student-centered learning in the classroom. Only 1 participant (6.25%) strongly disagreed. The weighted average for Question 9 was 3.5.

According to most participants, student-centered learning was an area of focus for their schools, which resulted in instructional opportunities as well as professional learning opportunities for teachers. Specifically, many of the principals interviewed discussed topics such as project-based, experiential, and real-world learning to support students in the classroom. Opportunities for improving students' skills through techniques like the reading-writing workshop model was used for scaffolding the learning process. The scaffolding process was embedded into the curriculum to build critical thinking skills and support students in the classroom. Participant 8 articulated the reasons scaffolding was important to their school:

> So, let's say their mini lesson was on character analysis and the students are independently reading, the teachers are going around and they're conferring with three students during that class time. So, they should have notes already where the students are. So that's where the scaffolding will happen.

Principals also shared that teachers often need support in identifying and developing student projects that relate to content. Participants also noted that strategies implemented as a school were an integral part of the process of achieving their goals.

Participant 11 observed :

> I think that is what my teachers need help with because it's not necessarily something that can just be taught. They need to see it, they need to have it modeled, which we have people coming in to do that. But it's a process and they're not used to it.

Several noted, however, that mandated state and district standards covering curriculum content was a limiting factor in how schools could weave strategies and techniques into subject areas.

Principals indicated that implementing constructivism was part of the schools' regular routine. Each school decided how they would implement approaches based on a variety of factors, including availability of specialists, time, training, and coverage. One school choose to implement approaches by grade level gradually based on teacher input. Participant 9 stated that they sent teachers to a two-day training conference one year, which they believed was successful due to the ability of teachers to implement the new strategies immediately. This participant also noted that professional development and training like that created excitement about the approach and kept staff interested in digging deeper into how they might guide their students in this process:

> And it's the same thing for the teachers as it is for kids. That different people need different things. I find that because I'm new this year I went to the first, one of the first trainings that we had, on the reading workshop because I was new to them, it was right before school started.

Active Assistance in Implementation

For Question 10, 12 participants (80%) out of 15 often helped teachers implement problem-solving approaches with their students, two participants (13.33%) sometimes helped teachers implement problem-solving approaches with their students, while one participant (6.67%) rarely helped teachers implement problem solving approaches with their students. The weighted average for Question 10 was 3.73.

Implementation of student strategies was referenced in all interviews. Survey items included questions pertaining to strategies teachers implemented in the classroom and ways in

which principals supported teachers in their implementation. Interview responses included participants' explanations and descriptions of improvements they noticed after implementing constructivist approaches. The degree to which principals understood and articulated the significance of teaching strategies indicated the degree to which they considered constructivist approaches effective. In interviews, principals openly shared the processes and outcomes of using constructivism in the classroom.

The study data reflected that principals supported teachers in building students' repertoire of strategies in critical thinking skills. Through authentic activities, students' understanding of conceptual knowledge supported their learning. Participant 8 compared these authentic activities to going back to the engineering design process. By embedding the process into the curriculum, students became true problem-solvers as they had acquired enough conceptual knowledge to solve the larger problems they encountered.

Principals also found that by encouraging and supporting teachers through professional development, teachers gained more knowledge and were more confident in implementing strategies. Interview data also referenced student-centered strategies as integral to improving teaching and learning. Training, however, was fundamental to the implementation of constructivism. Participant 1stated:

> It is a philosophy of teaching and learning where students construct their own learning through their personal experiences and knowledge. So, it's more student centered. Discovery learning versus overt teaching of facts. It's not just a set of instructional approaches that teachers have, it's a way of thinking. It's a fundamental change in the culture. Students learning through critical thinking skills, higher order thinking skills, and being guided through.

With respect to the statement, "I help teachers use inquiry-based teaching" in Question 11, six participants of 15 (40%) often helped teachers use inquiry-based learning, eight participants (53.33%) sometimes helped, and one participant (6.67%) rarely helped teachers in this way. The weighted average for Question 11 was 3.33.

Question 13 explored the degree to which principals believed that teachers guided students as facilitators in the learning process rather than use an overt means of delivering information to students. Three out of 16 participants (18.75%) strongly agreed with this statement while 12 (75%) agreed, and one participant (6.25%) disagreed. The weighted average for Question 13 was 3.13.

Question 14 measured the degree to which principals collaborated with teachers in determining constructivist instructional strategies to implement in the classroom. Out of 15 respondents, seven (46.67%) responded that they often collaborated, six (40%) sometimes collaborated, and two (13.33%) rarely collaborated with teachers in this fashion.

Principals reported that support was provided for teachers through district-sponsored PD, student-centered classrooms, faculty meetings, coaches' meetings, consultants, colleges, summer meetings, and conferences. Participants noted that professional development strengthened teachers' abilities to foster students' critical thinking and problem-solving skills and that such training was essential. Planning for student-centered classrooms included developing lesson plans that provided embedded strategies. Participant 8 stated that "not everybody's there yet because we now put out different materials and have kids come up with problems on their own. We want their brains ready to engage and be going into all of it to think and not just do a paper."

Principals commented, as well, that teachers' knowledge regarding constructivism varied. One principal noted that when they were newer to the field, their experience was that

constructivism was composed of various elements required for students to learn and do, depending on their learning styles. Principals also expressed similar views towards professional development and its importance in supporting teachers' growth. Among 12 participants, PD was mentioned on 56 different occasions, totalling 72%. As Participant 6 commented, "I don't think it necessarily comes naturally. Because if they haven't tried it out or done it it's one of those things, I think, as you teach a few lessons like that you start to see if your kids are making a connection or not."

Another factor that principals thought helped to improve teacher strategies and implementation of constructivism were walkthroughs, which provided teachers with immediate feedback on classroom practices. Several principals created their own professional development within the school rather than use outside vendors in order to provide teachers with a train-the-trainer model. Participant 4 explained:

> So, basically, we are a school that is constantly professionally learning. We have a relationship with Teacher's College, which is the reading and writing, um, people there who send consultants to work with us over the course of the year. And then we spend time analyzing and reflecting on what we've been doing over the course of the year. Um, I think that the lion's share of professional learning comes out of my budget and we are very school based.

Most of the principals expressed that professional development was provided through the district and that, as a result, not all PD met the needs of schools or teachers. Some principals noted that they received additional staff to support their PD goals when the district was unable to afford an outside vendor. Sometimes, Participant 5 explained, they provided the PD themselves:

> We were fortunate here; to have elementary curriculum coordinators in math, social studies and English language arts. So, every month, the principals meet with the curriculum coordinators, the superintendent, the assistant superintendent, and the tech director and the special ed director.

In Participant 5's district, principals, curriculum coordinators, and district level personnel were fortunate that they could gather monthly and talk about the needs of schools in each subject. In addition, PD was also discussed at different times of the year to determine, as a group, what the needs of the district were and in what areas, as well as how to approach them. Interview participants reported that they would allow teachers to request topics or send people to outside training, depending on whether the request was pertinent to the school's goals. Participant 6 explained:

> So, it's whatever I've had in my life. like I would take the findings of what you're doing now I would add that to my collection, and then I would be able to pick through that and say now I'm going to provide this professional development for you. There isn't a lot that I can send people to that's very cost effective.

Other than the one or two days of professional development that principals were offered, principals generally brought people in for PD on early release days. Participant 8 noted the financial constraints associated with funding relevant to professional development:

> Budgets were tight, under $5,000, therefore grant writing became imperative for PD for staff particularly if you're not in an underperforming district. I ran professional development the first day of school. I would take the findings of what you're doing now and present that to my faculty, then I would use that to

> present that to them and provide them with professional development opportunities during PD days or faculty meetings.

Several principals noted that professional development is critical "because it's how people learn." Like embedded student learning, adults need new learning situations to ensure cognition occurs.

Not every principal provided feedback in the same way, however. Much depended on the culture and community of the school:

> The biggest way to support them is to evaluate them and give them feedback. And it doesn't have to be the evaluation that goes into the system. Like I have two systems, I do the evaluations that are required for their contract and those need to be signed off on. And I have another system which I worked out with them a few years ago and they're called walk-throughs.

Another principal noted that they used a Google form (which they did not require teachers to sign). They just printed out the form and placed it in the teachers' mailboxes for immediate feedback. This was what the principal called "quick glimpses" of feedback in which the principal would conduct walkthroughs, sit for ten minutes, write down their feedback, and share it. The idea behind it was that it was done so frequently that teachers became used to it and viewed it less as an intrusion on their classroom. As one participant stated:

> Analyzing the strategies that students use [during reading conference], providing direct instruction coaching of a needed strategy and follow up to note if students made the strategy their own. I often ask, "Who is doing the work?" to make the point that just because the teacher is teaching something, doesn't mean that the kids are learning. It's a constant reminder to attend to active learning.

Through active participation in classroom rounds, participants noted an opportunity to assess student and teacher knowledge. The phrase "assessing student and teacher knowledge" was a high priority with several principals. They agreed assessment was a key factor in gauging the fidelity of constructivism implementation. They also mentioned various district-and state-mandated assessments as well as project-based assessments in evalutating students' progress; however, daily assessments were more informative as to students' knowledge and overall progress. Participant 6 noted that when the raw data from standardized testing is available, it is reviewed and then passed to staff to create their own charts. In this school, the participant claimed students were not only more willing to take risks but were also enjoying learning more. The greatest inventions, according to this school principal, were "mistakes" and that's where they felt their students excelled. These students became "more excited and had more self-esteem" because they felt that "ah-ha" moment when they finally get it.

In terms of promoting constructivist learning in the classroom, teachers employed strategies such as the workshop model in reading, and writing, and math, reciprocal teaching, scaffolding, and differentiated instruction. The workshop model in reading and writing focused on creating authentic readers and writers, engaging students in having a choice over texts as well as the pieces they wrote. Reciprocal teaching offered instructional activities for students in the form of dialogue between teachers and students. This approach takes segments of a text and constructs the meaning while promoting students' reading comprehension using four specific reading strategies to support comprehension: questioning, clarifying, summarizing, and predicting. Differentiated instruction provided all learners with a range of assorted avenues for understanding new information and acquiring content, such as processing, constructing, or

making sense of ideas. These strategies provided the basis for improving, enhancing and generating students' knowledge.

Participants also noted that once students began to develop a sense of comfort, they were relaxed before entering the classroom. Both principals and teachers, participants claimed, played an important role in encouraging students to be independent, to feel safe, and to grow their confidence. Administrators worked with teachers to discuss ways to provide appropriate activities that allowed students to make autonomous choices. Participant 5 stated that in order to achieve this, principals worked cooperatively with staff to identify learning activities that were complex. Across the data, there were many indicators that evaluation and feedback was imperative to moving teachers forward in their practice. Participant 3 commented:

> It doesn't need to be a summative evaluation to help provide teachers with their feedback and professional development. We have enrichment meetings to discuss curriculum and learning and where the gaps are.

It was clear that participants viewed PD offerings and working closely with teachers as essential in creating a culture in which students could make mistakes and take risks. Project-based learning became a roadblock at times due to a lack of resources, however. It is important to note that one special education facilitator practiced constructivism, as well, and had not found anything else that really worked that wasn't costly or time consuming. As a type of pre-referral for academic testing, some principals placed students in a class with a teacher who had more of a constructivist mindset and strong practices, noting "we kind of use it as a way when we're sort of claiming classes that you don't get in a more traditional mindset."

Guiding Research Question Two Themes

Table 3 indicates the themes that were relevant to Guiding Research Question Two and the codes that were grouped into themes. To indicate how principals reported they helped teachers implement constructivist teaching and learning practices, 250 data units from 12 interviews and one survey were used.

Table 3

Research Question 2 Themes and Codes

Theme (bold type and left-aligned), sub-theme (standard font and partial indent), or code (italicized and full indent)	Number of sources contributing	Number of data units included
Dialoguing on best practices	**12***	**29***
encouraging teacher initiative	8	11
how to dig deeper	6	7
Implementing successful strategies	**13***	**104***
strategies: teacher development	12*	37*
collaboration and team teaching	6	8
teacher observation-feedback	10	15
student-related strategies	13*	67*
differentiating instruction	7	10
problem solving skills	7	11
project based learning	4	6
student to student-group-workshop model	8	18
Support through professional development	**11***	**56***
district sponsored PD-curriculum coordinators	5	7
STEM related PD	1*	12*
student centered	4	5
Using knowledge of constructivism	**13***	**52***
assessing student and teacher knowledge	13*	40*

	anecdotal informal evidence of progress	9	12
	CPT5 and benchmark assessments	10	18

Note. An asterisk indicates that the source count or data unit count represents the aggregated values for any sub-themes and codes included in the theme.

Guided Research Question Two Findings

One finding emerged from Guiding Research Question Two:

Finding #2

Principals develop the capacity of teachers to use constructivist approaches through communicating its value, providing professional development, creating opportunities to collaboratively develop constructivist practices, and observing constructivist practices in the classroom.

Participating principals supported teachers' use of constructivist approaches by facilitating professional development, collaboration, and dialogue. They ensured that teachers received the training they needed by contacting consultants and scheduling training during faculty meetings as well as during instructional coaches' sessions. These sessions occurred using creative scheduling for coverage, faculty meetings for training, and coaches to block times to meet with teachers for dialogue and discussion.

Principals fulfill fundamental roles in developing the capacity of teachers to use constructivist approaches through their leadership. Interview data showed that principals supported teachers' by sharing data, techniques, and strategies and by ensuring that the main schedule provides time for learning opportunities.

Principals also supported teachers' by designing the school environment to allow more freedom through scheduling. Schedules were arranged to provide coverage for classrooms using

specialists to provide additional opportunities for classroom teachers to observe their colleagues, and prepare activities suited for individual students and group work. This afforded students with additional support and increased students' opportunities to problem solve and think critically.

Guiding Research Question Three

What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

The goal of the third research question was to determine the factors and conditions principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning. For this question, the relevant interview questions were 3, 4, 7, and 8. The survey questions were 21, 22, and 23.

Partnering with Districts

Question 21 on the survey gauged the extent to which principals considered themselves as working as partners with their district to align curricula standards with constructivist approaches to teaching and learning. The data revealed that, out of 16 respondents to the survey, one participant (6.25 %) strongly agreed with the statement, eight participants (50%) agreed, and seven participants (43.75%) disagreed that they worked as a partner with the district in this fashion. The weighted average for Question 21 was 2.63

During an interview with one principal, they were candid in stating that principals have only some control over certain aspects of their ability to align curriculum. Interview data demonstrated that all the principals who were interviewed strongly agreed that curriculum factors played a role in implementing constructivist approaches. Principals agreed that a willing team was necessary to implement constructivism and to create a plan to address student independence, discovery, and problem-solving, which are integral to the process:

> You have to be an administrator, and I've worked with administrators who are now that and I grew over time as an administrator what I wanted to be and what I didn't want to be. If you have someone who is a "gotcha" person taking a risk, or you just do scores. That is ultimately a decision one must make as an administrator.

One principal's online survey response included the need for a more flexible curriculum that allows staff to respond to learners' individual needs and interests. Other interviewees also expressed a need for flexibility:

> If we could shift away from such content heavy curriculum and move towards more thematic learning that allowed for greater freedom and in-depth exploration of one theme over the course of the year, we could dramatically shift towards more constructivist learning. The amount of content teachers are required to "deliver" set forth by the district really hampers the ability to have students engage in authentic problem-based learning.

This type of flexibility gives principals the freedom to allow teachers to explore concepts over time and develop a sense of exploration for students who discover meaningful learning. One principal discussed that collegiality and a willing team helped to drive trust and to ensure that all teachers were on board. This sense of team was accomplished by walking around the building and talking to staff, asking them how things were going. It wasn't just a quick check in; it was a two-way conversation asking for feedback about what was working and what teachers felt needed improvement. Participant 1 talked to one person in each grade level and asked, "how are things going." Sometimes sending an email would suffice. But there was always some form of

communication to ensure that if something needed addressing, it was performed as a team. Participant 1 stated:

> I use a rotating schedule. Once every 6 weeks, each grade gets 30 minutes time. For prep, that have one every day and they have an additional one every six days. I feel like it gives them freedom to create to take the curriculum that they must teach, they know what they must teach.

This arrangement provided teachers with time to be creative as well as time to incorporate the standards and district requirements into the curriculum and still be accountable. If teachers used the strategies and techniques applied to constructivist approaches, they could take ownership of their lesson implementation. Participant 4 chimed in by stating, "I feel like it can be a, a modality that holds people just as accountable as standardized testing does. It's just in a different way."

There was also a belief by some principals that constructivist schools and thinking can change the world. When asked about where that belief came from, Participant 6 explained:

> To me that's where I think some of that constructivist approach came from. They had someone in their life whether it was in boy scouts or it was a mentor, or it was their school, whether it was a charter school, a Montessori school, a public school, a renaissance school, your typical school, homeschooling. What was it in your life that made you think a little, not even in a box? Just the glass is not half full, half empty, it's not even a glass. It's a container. What led you there?

Participant 6 noted that transforming teaching and learning involves a leader who thinks differently and approaches teaching with a different perspective, that staff must be willing to take a risk. Indeed, it is vital that "you have someone who is willing to allow your staff to take risks rather than being a "gotcha" or someone who is simply concerned with scores."

According to participants, most of their teachers stayed within their buildings regardless of the population, socioeconomic issues, learning issues, or any second language learners, which they all believed was "good." As participant 8 noted, "It was apparent that they [teachers] are the ones putting in all that extra time and there's not a ton of support as far as money or resources go from the district or the state and they figure it out. It comes out of their pocket and out of their time with family."

Interview and survey data suggested that the most prominent barriers to constructivism in schools included: (a) curricular-instructional challenges, (b) less successful teacher strategies, (c) moving teacher comfort zones, and (d) funding or other issues outside the curriculum. Principals acknowledged the challenges for principals who must determine best practices for teaching and learning. Instructional strategies for helping students engage in meaning-making with peers varied across schools. Principals also reported that district-mandated curricular requirements were a common challenge. Interview data revealed that most principals interviewed agreed that these mandates hindered them.

In the interviews, principals often described curriculum that no longer aligned with their goals or with student assessment as an issue. This left principals with designing ways to be creative with the curriculum to align with teaching and learning. The majority of responding principals discussed challenging teachers' comfort zones. One principal noted that some teachers are strongly committed to programs and curriculum and are uncomfortable with change:

> When we added the makerspace, one grade level was reluctant to go to the space while others embraced this hands-on activity. It took several meetings and conversations to get teachers comfortable with using this space and this experiential learning. Moving teachers out of their comfort zone is always difficult but can be done successfully.

Similarly, other participants described teacher comfort zones as a limiting factor in facilitating teachers' embrace of constructivism. In order to make sense of strategies and concepts in a new way, participants agreed that this area was more problematic for some teachers. Teachers without training and less experienced teachers were less able to execute constructivist approaches. One of the more difficult trends has been teachers coming from a very standardized approach where, according to Participant 10:

> It takes them [teachers] a while to see it happen. Building teacher confidence and allowing them to take risks and feel that they were not being judged also helped them to feel more comfortable in building strategies. Creating a feeling of trust where teachers could learn from each other helped to define the schools' climate and it was pervasive in all the activities within their schools.

A challenge in implementing a constructivist approach is teachers' confidence combined with the time involved in becoming proficient, particularly as a new teacher. Participant 4 stated that "[t]here needs to be a belief that when a principal enters a classroom they will see certain techniques and strategies and be able to evaluate you on them, while still allowing you to feel secure because the evaluation system has changed."

Age, training, and the stage a teacher is at in their career also affects their confidence level. Novice teachers are used to having a program that prescribed what they need to do in

somewhat of a scripted format, according to some principals. Therefore, newer teachers can be somewhat intimidated when they are not provided with a formalized directive or plan. They require more support and modeling from the instructional coach and from the principal through classroom observations.

Some participants transferred teachers into new roles due to control issues. Principals believed that by distributing these teachers it would help to disband any controlling personalities and perhaps help to improve any negative attitudes.

Project-based learning was also described as a roadblock by one participant due to the difficulty funding resources at times. Some staff struggled to generate new ideas for projects after years of being handed a boxed curriculum, leading some participants to wonder if teachers' creativity had been stifled.

Managing less successful teacher strategies was also a concern of principals. They noted that understanding teachers' areas of weakness is integral to building up strategies for student success and that involving teachers in identifying areas that need improvement is key to helping them achieve a mastery of strategies.

According to Participant 1, an area teachers excelled in was analyzing summative data, observing that "[t]o me it's what separates the good from the great." An area teachers grappled with, however, was determining the various types of learning styles:

> We did a survey of all the teachers. We did a survey of the students to get there, the students' perceptions of themselves as it relates to the school and their own learning. And these, the teachers' perception of learning and their own practice. Then we did a walk-through to see, we identified certain elements of metacognition and elements of construct, what is the world, um problem-solving.

Some principals reported the importance of helping teachers to understand and recognize strategies to increase critical thinking and problem solving. Participant 5 stated:

So we'll see kids out in hallways with iPads and making movies and writing scripts or we'll turn the corner and see 3rd graders doing some sort of physics activity and um, you know. So we see it also in kindergarten and 1st grade, with varying degrees, but as I walk through the building, I'll see kids in the halls in groups, in their classrooms, and just collaborating with each other and asking why are you doing this or oh could we do this a better way?

On deeper questioning, some principals expressed that not all curricula are equal and that teachers must create a safe environment for students to take risks. They asserted that learning should not be all about test scores because scores do not tell the whole story. Principals reported that they have no way to measure soft skills or executive function skills unless students see a neurologist with a specialty in developmental psychology. Most students do not have that opportunity and there is no other metric available. One principal questioned this dilemma:

> How do you measure these other skills about taking turns, listening, hearing an idea and adjusting it? How do you measure that other than what you see and do? Same thing with staff. Our staff are more willing to try, go back to what their life was like, or they see the value particularly in classes where kids are more open to talking about really just don't have a meltdown on the ground because they couldn't figure something out right away or work on something. They have, I think constructivist gives a little bit of coping strategies. Because you learn about support teams. It's not called that, but I could be way off, but that's how I see it.

District and national mandates also have an impact on principals' ability to operate. Over 58% of the principals who were interviewed agreed that both district and national mandates

affected their ability to shape the curriculum and assessment in their schools as well as their professional development decisions. Principals made comments such as "release from district mandates on particular assessments (writing prompts)," "less of a focus on state testing/multiple choice questions," financial supports, and "emphasis on district goals not aligned developmentally to student needs." One principal stated that budgetary constraints were a problem:

> Our financial guy left for another district. And the new lady has found that we're like 2 million in the hole this year. It's tough. It's sad, you know, and it's the people working every day that are making up for it.

Budgetary issues were a common concern. One principal noted that they found it difficult to accomplish their goals:

> We're a Title 1 targeted assistance school, so we get some money, but our budget was 370 last year and is 200 this year so we lost 170 grand. So, we really cut down on the number of 19-hour aids we can bring in. So that really handcuffed us in a lot of ways because that's where we were able to really, really stretch out and try to help kids.

Schools. however, had different ways of dealing with these financial issues and goals. For example, Participant 2 shared that their colleagues in other schools and districts were also facing a tremendous amount of pressure because they're being assessed through state and district testing. The concern was that the goal of their schools did not necessarily match the assessment. Additionally, the work in their schools was more about learning than merely achievement on a test. Participants felt that the manner in which schools are developing today minimizes student growth.

Frustration was voiced over many issues that participants had no control over, such as student attendance, language barriers, lack of parent participation in school, and home connection while still being held accountable for student grades and achievement. Participant 6 noted that the biggest problem, however, was student engagement.

Some schools were mentored by colleges to help support them with curricula. For example, one participant mentioned that the teachers college model was used to inform the math workshop model in assisting teachers' understanding and implementation of the model with fidelity. As Participant 1 stated, "We found out that kids are able to read and discover at their own levels and they carry on conversations at different reading and writing levels using the same vocabulary."

The design and implementation of creative schedules provided teachers with time to gather, discuss, and plan using a makerspace for creating hands-on activities. According to one participant, teachers were initially not comfortable moving out of their comfort zones. However, the use of a makerspace which housed materials and provided space for creation of items allowed teachers to see that principals were invested and supportive of this venture. Participant 8 stated that watching a teacher "at a white board using a projector or presenting in a lecture format, the better the chances of having a student become disengaged."

Principals found that some teachers do not come from their master's programs prepared with the types of approaches necessary to teach students critical thinking skills:

> I think it takes them a while to see it happen and because there's also a confidence piece to that too as a new teacher. Teachers need to feel secure when teaching in a constructivist manner as they need to feel secure when principals enter the

> classroom and see students in small groups, dialoging and conducting complex tasks.

The consensus was that the role of principal is to support the philosophy and to give teachers the tools they need to feel successful and to feel that they are supported. They believed that what was valued most in schools was for principals to have their teachers feel supported and valued and for them to know that the philosophy was supported as well. As Participant 1 noted, "Over time, I've been able to bring in a team that does that."

In fostering a constructivist learning environment, participants noted there was a certain climate in their schools. This quality was unique to each school and it affected the way people acted and how teachers responded to initiatives. As Schein (1990) observed, culture is seen as a shared set of norms, values, beliefs, and assumptions, which influence the way members, look at the world. In this situation the school was their world. Participant 2 described success as

> the willingness of the staff to have a buy in, which is not easy! People have tried to do this; others have tried to do similar things in other schools. They haven't been able to because they get pushback. This was described as the curriculum driving what the teachers are executing because that's the manuals they're using or that's the program they're using. So, the culture sort of drives, too, how and what happens. And every culture in a building is different. We're very fortunate here.

Guiding Research Question Three Themes

To indicate how principals report they help teachers implement constructivist teaching and learning, 250 data units from 12 interviews and one survey were used. Data revealed that principals reported needing more time to work on critical thinking skills and problem-solving

skills in the classroom. They also reported that standards were inhibiting them from working on getting the work done that they wanted to do and that fewer standards would help them in completing the critical work that they would like to do in the classroom. In addition, data showed that additional time was needed for common planning time as well autonomy from the district that would allow them to make decisions based on the needs of their students.

Most principals responded by stating that barriers (such as standards) prevented teachers from focusing on process over content and that with fewer standards, teachers would be able to dedicate more time to instruction. Content-laden curriculum hampered teachers by setting forth a delivery mode of instruction versus a learner-centered process of student inquiry in the classroom. Principals also stated that more autonomy was needed from district demands that would allow faculty to be part of the decision-making process with respect to common planning time with teachers and for horizontal team meetings. Professional development was another concern as principals believed that teachers needed more and better training in constructivist approaches. Principals also voiced a need for financial support.

Table 4 demonstrates the themes that were relevant to Guiding Research Question 3, and the codes that were grouped into themes. The two major themes that emerged were barriers and challenges and facilitating factors.

Table 4

Research Question 3 Themes and Codes

Theme (bold type and left-aligned), sub-theme (standard font and partial indent), or code (italicized and full indent)	Number of sources contributing	Number of data units included
Barriers and challenges	**13***	**69***
curricular-instructional challenges	13*	29*
issues outside curriculum	12*	40*

district-national mandates and funding	7	12
Facilitating factors	**12***	**59***
curriculum facilitating factors	**12***	**41***
A willing team	7	11

Guiding Research Question Three Findings

Two findings emerged from Guiding Research Question Three:

Finding #3

District-mandated curriculum and instruction requirements, budgetary issues, teachers' resistance to change, and their limited knowledge of constructivist approaches were barriers to implementing constructivist practices. District-mandated curriculum and instruction requirements did not necessarily match the goals of their schools or their students' needs.

In addition, the lack of budgetary funding impacted the ability of school principals to hire consultants and send teachers to conferences to train them in strategies. Resistance to change was exhibited by some teachers, which may have been a result of their past experiences. When novice teachers or seasoned teachers are unfamiliar with newer approaches and initiatives, they become resistant to adopt them.

Leaders faced some challenges in implementing change initiatives. Foremost among these challenges is preserving a positive climate when one or several teachers are resistant or difficult. For a school to move forward, leaders must attend to day-to-day school climate and school *culture.*

Finding #4

Principals develop schedules so that opportunities for common planning time and facilitating the development of constructivist approaches are built into the school day. Factors

that promoted the implementation of constructivism in schools included the principals' creativity with scheduling to include common planning time as well as professional and faculty meetings to further provide time for staff to dialogue on strategies and techniques. During faculty meetings, principals conducted PD to further support and develop teachers' knowledge of approaches. Common planning time was allocated for teachers to discuss concerns, accomplishments and ways of approaching implementation of constructivism with the Instructional Coach.

Chapter Four Summary

This chapter included a presentation of the findings and themes that emerged from the study data. Analysis of the data suggested answers to the three research questions that guided this study. The four findings from Chapter four are as follows: (1) Principals believe constructivism has a profound influence on the critical thinking and problem-solving skills of students. (2) Principals develop the capacity of teachers to use constructivist approaches through communicating its value, providing professional development, creating opportunities to collaboratively develop constructivist practices, and observing constructivist practices in the classroom. (3) Principals identified district-mandated curriculum and instruction requirements, budgetary issues, teachers' resistance to change and teachers limited knowledge of constructivist approaches as barriers to implementing constructivist practices. (4) Principals develop schedules so that opportunities for common planning time and facilitating the development of constructivist approaches are built into the school day. Chapter Five includes a discussion of each of the findings, recommendations for future research, and final reflections about the study.

CHAPTER FIVE: SUMMARY, DISCUSSION, FUTURE RESEARCH, AND FINAL REFLECTIONS

Introduction

The final chapter of this dissertation includes five sections. The first section is a brief overview of the first four chapters. The second section includes a discussion of the findings and their significance and is followed by the study's implications for leadership at state, district, and school levels. Finally, recommendations for future research are provided and are followed by final reflections.

Study Summary

This study sought to provide insights into the perceptions of elementary school principals regarding their role in promoting constructivist approaches to teaching and learning. Numerous authors as well as a growing body of research have confirmed the importance of constructivist approaches for increasing critical and cognitive thinking skills. This research substantiated the significance of constructivist approaches in supporting student learning. Chapter One introduced the dissertation and provided an overview of the study. It included a personal statement that described my interest in the topic, a statement of the problem, the purpose of the study, and the three guiding research questions. In addition, Chapter One included the delimitations and rationale for the study as well as key terms, an overview of the proposed literature review, and the significance of the study.

Chapter Two established the conceptual framework for the study through a comprehensive review of the literature that examined the philosophical underpinnings, major contributors, and theories relevant to the concept of constructivism. In addition, the literature

review included relevant research related to educational leadership, cognition, psychology, and philosophy as well as the work of Vygotsky, Piaget, Bruner, and Dewey.

Chapter Three presented the design of the phenomenological qualitative study. This chapter also included a discussion of the methods and procedures used to identify participants as well as collect and analyze. All participants were elementary principals serving K-6 students who promoted constructivist approaches. Chapter Three also addressed issues of trustworthiness and confidentiality.

Chapter Four presented survey and interview results, which were organized according to the three guiding research questions that framed the study. An analysis of the data was also included and the chapter concluded with the identification of four findings.

Via interview and survey, the study illuminated a disparity between current educational practices and constructivist approaches to teaching and learning as reported by elementary school principals. It also revealed a gap between what is recommended in the literature and what is commonly found in classroom practice. Numerous authors as well as a growing body of research have established the importance of constructivist approaches in increasing critical and cognitive thinking skills in students and emphasizing the need for school leaders to encourage teachers to use constructivist approaches in order to foster in students the skills necessary for the 21st century global workforce (Kagan, 2004). Only through a paradigm shift in current teacher preparation and established teaching practice can schools effectively foster constructivism as a preferred instructional approach (Vogel, 2012).

The epistemological premise of constructivism is grounded in the assertion that learning and knowing are intrinsically intertwined. According to cognitive constructivism, previous experiences and prior knowledge combine as students formulate ideas and construct new

knowledge (Dewey, 1938). Vygotsky (1978a) proposed that the relevance of constructivism derives from theories of language and thought and their negotiation by society at large. Bruner (1960) considered the role of strategies for cognition regarding constructivist learning, which formed the basis for understanding *knowing* as a process and not a product. Also outlined, the purpose of this study was to identify perceptions of elementary school principals regarding their role in supporting teachers implementing constructivist approaches to teaching and learning. The study examined: (a) elementary school principals' understandings of constructivism, the degree to which they felt constructivism was an essential instructional approach, and whether they considered it a vital part of their leadership role; (b) the various approaches elementary principals used to help teachers implement constructivism; and (c) the factors and conditions that principals believed would support or inhibit them from assisting teachers in applying constructivism. The study was guided by the following three research questions:

RQ1. To what extent do elementary school principals consider constructivism to be critical to the improvement of teaching and learning?

RQ2. How do principals report they help teachers implement constructivist teaching and learning?

RQ3. What are the factors and conditions that principals identify as promoting or inhibiting efforts to implement constructivist approaches to teaching and learning?

Discussion

The four findings presented in Chapter Four are as follows: (1) Principals believe constructivism has a profound influence on the critical thinking and problem-solving skills of students. (2) principals develop the capacity of teachers to use constructivist approaches through communicating its value, provide professional development, creating opportunities to

collaboratively develop constructivist practices, and observing constructivist practices in the classroom. (3) principals identified district-mandated curriculum and instruction requirements, budgetary issues, teachers' resistance to change and teachers limited knowledge of constructivist approaches as barriers to implementing constructivist practices. (4) principals develop schedules so that opportunities for common planning time and facilitating the development of constructivist approaches are built into the school day. Each finding will be discussed in the context of the relevant literature reviewed in Chapter Two. Additionally, the implications for practice for each finding will be explored and recommendations made for the future.

Finding #1

Principals believe constructivism has a profound influence on the critical thinking and problem-solving skills of students.

Constructivism Improves Student Learning

The first finding demonstrated that principals strongly agreed that constructivist approaches had a profound influence on the critical thinking skills of students. In interviews, principals reiterated the importance of aligning instructional strategies to school goals. This finding is supported by the indication that principals assisted teachers in the classroom through observation and feedback to strengthen and hone their instructional skills. Principals often supported teachers by aligning their school goals with their support of effective instructional strategies.

A variety of techniques and strategies were implemented in participants' schools aimed at developing constructivist skills in both teachers and students. Most principals in this study revealed that teachers developed students' critical thinking skills using a reading-writing workshop model to scaffold the learning process. Some schools in the study established a math

workshop to support students in developing problem-solving skills. Principals also described using reciprocal teaching strategies to build upon students' understanding while expanding their knowledge. Reciprocal teaching is an effective technique to support students through social interaction and discussions that extend and challenge their thinking using four strategies: predicting, questioning, clarifying, and summarizing (Palincsar & Brown, 1984). Assessments of students' reading comprehension increased from 30% to 70-80% when teachers used these strategies with students for 15 to 20 days (Palincsar & Brown, 1984). Teachers can implement these strategies in any order, depending on the students' levels of learning. Reciprocal teaching also improves reading comprehension for English language learners struggling with comprehension due to vocabulary load and background experiences (Fung, Wilkinson, & Moore, 2003; Hashey & Connors, 2003; Sollars & Pumfrey, 1999). Through Reciprocal teaching, students retain more of the content in their texts (Reutzel, Smith, & Fawson, 2005). Reciprocal teaching highlights cooperation and social interaction as essential teaching techniques. When teachers use these strategies explicitly, comprehension improves (Fuchs, Fuchs, & Vaughn, 2008). Principals' understanding of the value of Reciprocal teaching was evident in their interview and survey responses.

Additionally, principals understood that teacher guidance ensures that students build new knowledge based on accurate perceptions and interactions with course content. Classes consist of a variety of learners who develop at different levels and times. Often learners construct a different meaning than the one intended by either the curriculum or the teacher. According to theories of constructivist learning, this may be due to the way learners experience their surroundings or how they interpret information.

Participants noted that differentiated instruction helped develop students' independence, independent thinking, and metacognition. Principals emphasized that students in these learning environments seemed happier, more confident, and more excited about learning when they realized that it was acceptable to ask for guided instruction in an area in which they were less knowledgeable.

The principals in this study also believed that students learn better when teachers implement constructivist approaches in the classroom that specifically relate to critical thinking skills and progression of thought (cognition) when acquiring new knowledge. Participants described the value of focusing on critical thinking skills through supportive strategies like scaffolding content to encourage dialogue.

Metacognition was noted by the participants in this study as integral to students' construction of knowledge. They believed that teachers must design lessons that promote student thinking, discovery, and problem-solving. This finding is confirmed by literature on metacognition which suggests that effective learning involves planning, goal setting, monitoring one's progress, and providing for adaptation. Metacognitive knowledge and skills are necessary for effective cognitive performance and essential to learning and problem-solving (Bransford, Sherwood, Vye, & Rieser, 1986). When students employ metacognitive strategies for selecting and monitoring mental functions, they develop creative and critical thinking skills. Some examples include; modeling, self-assessment, and self-questioning.

Promoting critical thinking skills is also an essential component of instruction because it encourages individuals' construction of knowledge while encouraging curiosity and developing students' interests according to prior experiences (Salmon, 2008). Students who are

metacognitively aware are better able to plan, sequence, monitor, and reflect; they also demonstrate improved performance levels (Moore, 2004).

For principals to ensure the quality of teachers' instruction they believed they needed to leverage their role as an instructional leader. Therefore, principals spent time in classrooms observing the process of teaching and learning and providing valuable feedback to teachers. As principals recounted their experiences in this area they also noted the importance of remaining focused on their schools' goals. The master plan and keeping their eyes on the goals were always at the fore. As Hattie noted, "Along with goal-setting, feedback is the most powerful predictor of successful overall evaluation of instruction" (2009, p. 45).

Principals reported that teachers reflected on their own learning as well as on their students'. Participants noted that both teachers and students must be guided in their learning if they are to achieve higher levels of cognition and expand their potential. In the classroom, students who are actively involved and engaged in their learning are likely to work collaboratively to problem solve. Principals explained that when students were engaged through discussion, practice, or experiences in the classroom, they were more likely to learn the information and be able to transfer it to other and future applications rather than just memorizing the material for short periods of time.

To achieve these ends, principals stressed the importance of thoughtful lesson planning to promote critical thinking, problem-solving, and improved metacognition. When instructional practices require that students explain their thinking (metacognition) based on personal experiences, students are better able to reflect on their learning while deriving a logical sequence and conclusion. To improve teachers' lessons, some principals adjusted schedules to give teachers time to collaborate with colleagues and develop activities for students that would best fit

the constructivist framework. Based on the time frequently allotted to teachers for planning lessons, it was reasonable to conclude that principals valued problem solving strategies as a method for promoting student thinking and cognition.

Lastly and most importantly, principals emphasized that teachers need to consider students' current knowledge in order to move them to the next level of learning. Constructivist lessons, then, should include open-ended questions and critical thinking activities that encourage students to seek more than just a simple answer. Constructivist lessons provide students with the skills and strategies to justify and defend their own thoughts. Classroom implementation of constructivist approaches supports building on both students' and teachers' understandings.

Impact on Student Outcomes

As reflected in Finding #1, principals agreed that constructivist approaches were integral to successful student outcomes. Many aspects of constructivist approaches, such as dialogue, inquiry, student application of knowledge, critical thinking and problem-solving, as well as attitudes toward learning, influence student outcomes. Students' ability to express themselves and challenge each other's thinking is an important component of a constructivist approach. Although each school varied in its approach, all schools were involved in project-based learning (PBL). Principals described activities in which learning was ongoing and repetitive in nature. The PBL is one of the learning approaches that clearly reflects the theory of constructivism and follows Dewey's (1966) theory of learning by doing. PBL can be a powerful, transformative instructional strategy for students, as it is student-centered and encourages collaboration and problem-solving while developing students' creativity. Such an approach requires students to question, think, and work collaboratively to problem-solve authentic tasks. PBL lesson planning includes analyzing students' needs and the objectives of the course, planning the role of the

instructor and students, creating teaching materials, and preparing assessment methods to confirm student knowledge. The PBL approach engages students in solving complex interdisciplinary problems while emphasizing deep, conceptual understanding. It is important for learners to build knowledge by working through complex and ambiguous tasks. PBL emphasizes this type of learning, as it "employs scaffolding extensively thereby reducing the cognitive load and allowing students to learn in complex domains" (Hmelo-Silver, Duncan, & Chinn, 2007, p.1). In this study, projects varied by school; however, all were constructivist in nature.

Principals reported that students in their schools learned to think more deeply when they were supported with the approaches and strategies in PBL. Several principals discussed using the Socratic method of discussion to support students' abilities to debate critically and help foster critical thinking skills. Instructors supplemented PBL with hands-on, real-world situations that required students to elaborate on their responses to questions and prompts. An environment that allows for risk-taking and open Socratic discussion supports students' abilities to critically debate, either independently or as a group, and to foster critical thinking skills is essential (Paul & Elder, 1997).

Both experiential learning and project-based learning provided opportunities for authentic learning for students to engage in deep, contextual experiences. Principals commented that teachers created environments where students felt comfortable expressing themselves and challenging each other's thinking by creating a student-centered environment. Student-centered classrooms allowed students to negotiate, have shared control, and have a critical voice in the learning process. Constructivist strategies are often called student-centered instruction due to the emphasis on students as active learners. Teachers in this study provided student-centered

classrooms that guided students to discover their own meaning rather than delivering lectures and controlling all the classroom activities. Experiential education first immerses learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking. During interviews, principals communicated the pride they felt in being able to establish an environment that fostered critical thinking and problem-solving skills.

Finding #2

Principals develop the capacity of teachers to use constructivist approaches through communicating its value, provide professional development, creating opportunities to collaboratively develop constructivist practices, and observing constructivist practices in the classroom.

In this study, principals collaborated with teachers to develop relevant materials, routines, and structures to promote student learning (Timperley, 2011). Effective school leadership actively involves the educational environment (i.e., the school culture) to establish shared beliefs, values, and vision within the school community (Hargreaves & Fink, 2004). Based on this culture, school administrators communicated with both teachers and staff and nurtured sustainable leadership in their buildings in order to implement constructivist approaches. Principals supported teachers in finding the best strategies to help the students in their schools to develop critical thinking and cognitive skills. Strategies such as scaffolding, reciprocal teaching, Socratic dialogue, metacognition, and self-reflection helped to improve students' critical thinking and problem-solving skills. Flexible grouping accommodated students who were strong in certain areas and weaker in others. These types of strategies allowed teachers to tailor their teaching to their specific students.

Principals often described a sense of autonomy, creativity, and flexibility when planning for student learning. Despite state and district mandates, principals explained that teachers interspersed creative projects throughout the curriculum that incorporated constructivist approaches. Changing curriculum and standards require planning and creativity, so some of the principals discussed ways they used scheduling to meet the needs of their schools. Building teacher capacity, participants noted, takes vision, goals, and time, but, most importantly, it takes a community of learners who are empowered to work together in guiding students to succeed at higher levels of achievement.

By promoting professional development for teachers and scheduling time during the school day to ensure that teachers received valuable planning for PD, principals demonstrated that they valued critical thinking. Creative scheduling during the school day proved to be an effective way to ensure that teachers were provided with demonstration lessons in classrooms and able to attend faculty meetings where PD relevant to constructivism was provided. For example, time was allocated for special services, interventions, enrichment, and data analysis meetings with instructional coaches. One principal arranged a schedule that included specialists as coverage for classrooms so that teachers were free to collaborate.

Principals expressed that they wanted their teachers to feel supported in their endeavors to use constructivist approaches. One way that the participants showed support was by developing schedules that provided teachers with time and space where students could be creative and work collaboratively. They modeled their expectations through their actions rather than just through direct supervision and evaluation of teachers (Reeves, 2008). Principals organized meetings with instructional coaches, teachers, and staff to discuss the needs of students and to set goals. Most teachers reported to their principals that, in contrast to student

responses to traditional methods of instruction, students engaged more with constructivist content and were better able to transfer knowledge to other subject areas when they collaborated with peers. Some classes used the Socratic method of questioning to foster critical thinking. To ensure that these strategies were integrated into students' daily activities, principals required that teachers incorporated them into their daily lesson plans.

In response to the problem of student perseverance, some principals mentioned that they had encountered the problem of students giving up too easily; likewise, some teachers reported students feeling like they could not complete a task. Therefore, many of the principals interviewed had been working on the growth mindset approach. Teachers partnered with each other as well as students to coach students in how to fail. They purposely designed experiments that would fail and then asked their students, "Okay, what should we do next?" One school designed an outdoor garden overgrown by weeds. Teachers had the students observe and discuss the weeds' positive and negative effects on the garden. Through working in the weed garden, students learned how to prevent weeds from growing in the future and questioned whether they should do so. Teachers believed that this activity was a way of teaching the students' brains to be flexible while problem solving.

Finding #3

Principals identified district-mandated curriculum and instruction requirements, budgetary issues, teachers' resistance to change, and teachers limited knowledge of constructivist approaches as barriers to implementing constructivist practices.

The third finding reflected the factors and conditions that principals identified as inhibiting efforts to implement constructivist approaches in their schools. Inhibiting factors included district-mandated curricular requirements, time and budgetary issues. Principals'

contended with a lack of knowledge of constructivist approaches as well as teacher resistance to change in some instances. Many principals noted a lack of uniformity in constructivist strategies across schools. This was due to differences in school goals and staff knowledge. Most principals stated that their teachers only received one full day and one-half day of PD during the school year and that this district-wide PD generally focused on curriculum that conformed to district requirements.

First, principals noted that they did not have control over the curriculum, that it was chosen by district personnel and coaches without input from principals and without consideration of the needs of individual schools. Principals noted that they were required to follow established standards and align them with constructivist approaches, a time-consuming process. They also reported that following mandated curriculum while implementing constructivist approaches without the necessary support they felt they needed was problematic. Time was cited as a limiting factor for principals as constructivism is more challenging to implement than the traditional model due to the modeling, dialogue, and time for collaborative construction of knowledge through social negotiation. Through the student-centered model, teachers provided real-world, case-based learning environments that fostered reflective practice for both students and teachers.

Another factor that hindered principals was the budget. Due to constraints with school and district budgets, principals were limited to one to two days per year of professional development which was typically chosen for them and did not always pertain to their goals. This left principals trying to arrange PD themselves or having experienced teachers lead staff trainings using knowledge they had gained during either one-day trainings at summer conferences or independently throughout the year. In order to obtain the best training and

knowledge for staff, however, PD needs to be relevant and sustained. Budget constraints, which limited the quality and level of PD offered to teachers, inhibited the knowledge and capacity of the staff in successfully implementing constructivist practices.

In addition to scarcity of financial resources, principals' lack of knowledge regarding appropriate PD also inhibited the implementation of constructivist approaches. Principals must continue to build their aptitude by keeping current with instructional strategies and approaches that can best support students in the 21st century global economy. Since principal competence is needed in order to promote teacher professional development and enhance student achievement, participants noted that they needed to seek innovative professional development training for not only their teachers but for themselves.

Finally, the majority of the principals noted that addressing teachers' resistance to change was an important factor in moving them out of their comfort zone. Most principals explained that after holding several faculty meetings, teachers began to feel a sense of comfort and a greater willingness to shift their teaching methods from traditional to constructivist. Principals also noted that the greatest deterrent to adopting constructivist approaches was the accountability pressures they felt with respect to current standardized assessments. Some articulated concern that standardized student assessments do not account for the diverse learning styles of all students and that traditional methods of assessment are not consistent with constructivist thinking. This makes it difficult for teachers to feel comfortable in taking risks or trying new methods. In addition, novice teachers were deemed insufficiently trained in constructivist strategies and, therefore, lacked the confidence to implement constructivist approaches.

Instructional leadership theories support principals' indirect influence on student learning and their direct influence on instructional behaviors, knowledge, practices, beliefs, and

competencies of teachers (Leitner, 1994). In this study, principals diligently addressed how students learned as well as what they learned. The participants did express that there was some resistance to change by a few teachers; however, they were not specific as to what that resistance was specifically other than some teachers were hesitant to change to a new approach to teaching and learning. Both new and veteran teachers were inclined to believe that these approaches were just another "thing" that would pass or a requirement for which teachers had not received proper prior training.

Assessing Student and Teacher Knowledge

There are a variety of constructivist approaches to assessments that measure student progress. One common theme in responses from principals was the use of project-based assessments. Other forms of assessment included teacher-developed formative assessments that empowered students to reflect on their own practice and abilities. Participants were clear in their agreement with Vygotsky (1978b) that when students engage in dialogue, questioning, and debate, they extend their thinking.

Teachers determined students' knowledge through multiple assessment strategies, such as demonstration, verbal discussion, journaling, and creative projects. These assessments demonstrated a holistic method of evaluating the whole student. Through creative projects, teachers can assess students' knowledge using Bloom's taxonomy, which reveals techniques to help students learn content and gain problem-solving skills (Bloom & Krathwohl, 1956). Traditional approaches to teaching typically require low level thinking skills while constructivist approaches and assessments, such as application of Bloom's taxonomy require students to analyze material, make decisions, and create end-products that demonstrate their understanding and knowledge.

One principal described assessment strategies as creative ventures that were intertwined with constructivist approaches to teaching. Principals believed that these forms of student creativity and innovation were the best form of assessment as they allowed them to view students in multiple formats.

Assessment is a guiding influence behind countless forms of learning. Due to the importance that it plays in learning, it is vital to ensure that assessment promotes rather than hinders learning. Furthermore, learning should continue beyond assessment and it should meet the needs of the present while preparing students to meet their own future learning needs (Boud, 2000, p. 151).

Support through Professional Development

In this study, all principals agreed that professional development is fundamental to developing educators' instructional capacities. There was also a consensus that teachers required training in constructivist approaches to implement constructivism with fidelity. Continued professional development for administrators and educators is crucial, as their ability to apply new knowledge directly affects students. Principals expressed the need to develop teachers' capacities via training on constructivist principles and methods to further inform their understanding of concepts, planning, instruction, and reflection. Principals' also independently sought out opportunities to develop their own pedagogical skills as well as their knowledge of constructivist approaches to teaching and learning. Furthermore, they revealed that PD in constructivist approaches was an area of need. Principals discussed workshops, conferences, and consultants, but described these forms of PD as "one-and-done" trainings that failed to expand and support teachers' knowledge over time. For PD to be effective principals must provide occasions for

teachers to reflect critically on their practices and to transform new knowledge and beliefs about content, pedagogy and learners (Darling-Hammond, L. & M.W. McLaughlin, 1995).

One principal noted that their best PD often came from the teachers themselves. They noted that for teachers to build upon their skills, they needed to seek out PD in constructivist instructional practices, content knowledge, and strategies using their own resources. Other principals noted that the amount of PD provided by districts was not ample, which lead primarily to in-house training. School leaders are responsible for evaluating teachers; therefore, it is imperative as leaders that they seek professional learning opportunities to stay up to date with current research and pedagogy to provide essential feedback to teachers to improve instruction.

Principals reported that many schools have elementary curriculum coordinators who only specialize in science, math, or social studies. In addition, principals reported that districts were pushing for more technology in the classroom; therefore, much of the district funding was designated to laptops. Technology alone is not enough for students to make progress in the 21st century. To be effective, technology must be integrated across the curriculum.

According to Rebora (2004) generic, biannual PD does not effectively improve teacher understanding of techniques to support student learning. For teacher learning to be effective, it should occur in an active and coherent intellectual environment where individuals exchange ideas and form an explicit connection to school improvement goals. Ideally, PD should occur during the school day and be a regular part of a teacher's professional responsibilities (Wei et al., 2009).

One of the most important components of implementing a constructivist environment in a school is developing a sense of collegiality and a culture of professional development among staff. If teachers are to teach as they are taught, not as they are told to teach, they need to be

trained in constructivist-based professional development sessions. It is not enough for trainers to describe new ways of teaching and expect teachers to effectively engage in constructivist approaches based on a one-time PD training session; teachers must actively participate in PD. They must determine what to take from generic training and transform it to meet the individual needs of their students (Hoover, 1996).

Barriers and Challenges

Many principals believed that there needed to be a change in the way teachers assess students. The current testing methods in many districts do not match constructivist methods of teaching and learning. Standardized teaching and evaluation methods do not provide a true picture of a student's capabilities or progress; they only narrowly measure students' capabilities and knowledge. Principals claimed that due to past mandates and requirements, the current generation of teachers rely on programs that dictate what to teach in script-form. They noted, as well, that there is significant emphasis placed on standardized assessments; therefore, the idea of constructivism can be somewhat problematic as it does not include a set of directives which is not always quantifiable.

A teacher's job is not merely to promote learning on a specific set of objectives, teachers must see themselves as interdisciplinary thinkers as well as subject specialists (Noddings, 2013). The assessment of attitudinal and personal values requires a more holistic approach. Assessment portfolios that are meaningfully assembled as a "purposeful collection of student work providing a story of the student's efforts, progress or achievement in a given area" (Arter & Spandell, 1992, p. 36) tell a story of the students' understanding and knowledge. Portfolios may be the most suitable form of assessment to develop students' knowledge, skills, and attitudes, progressively and reflectively (Regehr & Norman, 1996). As well, portfolio assessments can be

an effective way to demonstrate student learning and growth as they triangulate students' knowledge and stem from a constructivist theory of knowledge (Biggs & Tang, 1998). Ultimately, for assessments to serve a formative purpose, they should reveal something about a student's critical thinking skills, misconceptions the student may hold, and progress toward the student's learning goals (Supovitz, 2012).

Finding #4

Principals develop schedules so that opportunities for common planning time and facilitating the development of constructivist approaches are built into the school day.

School-Day Schedule

The principals in this study created innovative schedules to ensure that the instructional climate of the school helped to support teacher pedagogy for constructivist approaches. These time configurations allowed for observation and feedback, professional development, additional time for creativity through projects, and collegial meetings. Participants supported, promoted, and guided their teachers' knowledge of constructivism in a variety of ways. Through classroom visits, they supported teachers in learning constructivist strategies by modeling various techniques and strategies. Several schools used the inquiry method in content areas which were supported and reinforced through faculty meetings, PD, and the instructional coach. Teachers also attended reading conferences to learn and analyze strategies that support students, provide direct instruction, and coach students on strategies. After implementing a new strategy, teachers assessed student work to ensure that the students were able to integrate the strategy into content areas.

Whenever possible, teachers were provided with additional opportunities for professional learning through grade-level and faculty meetings. Some schools were provided with

opportunities to observe classrooms in other districts. Principals also planned time for teachers to visit other classrooms and schools whenever possible; however, coverage for classrooms was difficult due to scheduling and funding for substitutes. Therefore, some principals set up rounds for teachers to visit other teachers' classrooms to view instruction and provide feedback from a more knowledgeable staff member.

Principals noted that encouraging teachers to engage in reflective practice was a vital part of implementing constructivism. Participants questioned teachers to help them reflect on their own practice and the objective of the lesson. They also questioned teachers about how they promoted student thinking, discovery, and problem-solving.

When a teacher teaches a lesson, some students may not actually be learning. Principals in some schools reported focusing on "accountable talk moves" where teachers determined the next learning steps for each student. They formed this approach based on social constructivism and Vygotsky's work, who they reported as the theorist that influenced them the most. After teacher's determined next steps students were matched with a competent person to coach them in that strategy. After practicing this strategy independently and checking in with teachers, principals described this as an effective constructivist approach that they implemented in their schools.

Professional Development

Principals found that professional development was essential for helping teachers grow professionally while enhancing their knowledge and skills. They noted that encouraging teachers to engage in reflective practice was a vital aspect of successful implementation of constructivism. Questioning helped teachers reflect on their own practice and the objective of the lesson. Principals also questioned how teachers promoted student thinking, discovery, and

problem-solving. They found that it was fundamental to developing teachers' capacities to implement instructional strategies. Professional development plays a vital role in transforming teachers' methods of teaching as well as helping teachers to go beyond understanding the surface features to a deeper understanding of the topic and the strategies being implemented. Principals in this study met regularly with teachers to discuss practices and strategies regarding constructivist approaches in their schools and the ways in which to implement them in the classroom. In addition, principals in each school followed up as to how students would be assessed based on student understanding, content and alignment of objectives and goals.

The principals' role in supporting and developing constructivism in their schools is critical to its success. The effort shown by the principals in this study demonstrated their commitment to observation and feedback, professional development, and additional time for creativity and collegial meetings.

Implications for Practice

School and District Responsibilities

School and district administrations have a responsibility to promote innovative instructional practices, such as constructivist approaches in schools. Although school administrators are responsible for the instruction their students receive, ultimately it is central administrators and district superintendents that are the gate keepers and the instructional leaders for the school district. For principals to have the support, training, and funding they need for constructivist pedagogy, the district must promote constructivist approaches as a valuable instructional strategy. Similar to the responsibility of school administrators, school district superintendents and central administrators are the instructional leaders for the school district. Without their support, schools will continue to depend on principals and teachers to implement

strategies and PD. However, this burden should not fall on principals and teachers. Districts need to offer adequate opportunities and time for constructivist-based professional development to properly support teacher development.

In this study, the principals articulated a need for a more flexible curriculum focused on thematic learning as well as greater freedom to engage students in deeper explorations of subjects. District requirements often hamper schools with content-laden curriculum. With fewer curriculum requirements, principals would have the flexibility to promote PBL. In turn, this would allow teachers to be more creative in the ways they choose to engage students in authentic learning. Policymakers must create policies that allow schools some autonomous programming within their schools. Currently, district leaders often make decisions for the whole district rather than incorporating feedback from individual schools and quadrants. However, the locus of control needs to be in the hands of those who provide educational services to students. Principals should be included in decision-making regarding new teaching methods before they are required to implement programs and strategies in their own schools. Each school has an individual culture; thus, learning strategies and PD must reflect the unique needs of each school.

It is also imperative that state and district mandates move away from a punitive labeling of schools and begin providing a more effective support system through funding and professional development for teachers, staff, and administrators. Testing methodologies require updates to reflect a more developmentally appropriate style of teaching and learning. A student's knowledge should be assessed through a collection of her work over time in combination with performances that involve collaboration with others as well as work involving complex problems that demonstrate student growth (Taylor, 1994; Wiggins, 1989). It is time to move from a culture of testing to a culture of assessment. School leaders must make decisions based on the conviction

that constructivist approaches to teaching and learning enable all students to reach their potential while cultivating creative thinkers and problem solvers. Policymakers and educators must decide whether they want assessment systems to rank and compare students, schools, and districts, or whether they want assessment systems to guide and measure student progress toward desired standards of excellence.

Principal Responsibilities

School leaders are critically important in implementing constructivist-based teaching strategies. All principals in this study agreed on the importance of supporting teachers in developing and implementing successful constructivist strategies through teacher development, teacher observation and feedback, intentionality in planning, collaboration, and team teaching. Although principals differed in their approaches to implementation of constructivism, every principal provided his or her teachers with some form of constructivist-based PD. Every principal was dedicated to setting aside time, materials, and space for constructivist-based learning for students and teachers.

Moreover, principals in this study realized that a willing team and a productive learning culture are needed to implement teaching strategies that foster student independence, discovery, and problem-solving. On a larger level, principals must facilitate collaboration between administrators, district leaders, and policymakers in order to promote the use of constructivist pedagogy within a district or state. Conversations between administrators, district leaders, teachers, parents, and school board members must address the need for the status quo to change from teaching that is didactic to teaching that is more constructivist in which students learn how to think critically and problem solve.

The inclusion of constructivist approaches to teaching will enable students in the United States to be competitive, creative problem-solvers in the 21st century workforce. Instructional practices must support students' construction of knowledge, taking into account *how* they learn as well as *what* they learn. Bruner (1966) argued that instruction is not a matter of committing results to memory; rather, it is teaching students to participate in the process. Participation is what makes the growth of knowledge possible. Ultimately, it is the principal's responsibility to facilitate a community of learners that excel through high-level expectations, open communication, and approaches to teaching and learning that foster critical thinking and problem solving.

Recommendations for Stakeholders

State Policy Makers

There's a general perception that the United States has lost ground academically, as educational performance has been essentially level for decades. Our current model of teaching is antiquated and a disservice to students. Moving from a traditional model of teaching and learning to a constructivist model is imperative if we are to significantly improve student learning. State policy makers must embrace the philosophy and approaches of constructivism and place it in the forefront of decision making. State Departments of Education must develop educational mandates that prioritize constructivist approaches as a requirement for administrator and teacher licensure, and states must set guidelines for local districts and municipalities in holding administrators and teachers accountable.

District

School districts must adopt state mandated guidelines for constructivist approaches. Districts must align goals, teacher evaluation systems, professional development, and teacher

pedagogy to reflect a constructivist philosophy. District level administrators must clearly articulate the vision and goals that align with new state regulations. Districts must also have access to new federal, state, and local funding to support robust constructivist efforts. Local school boards must hold Superintendents accountable for ensuring that state regulations are implemented district-wide.

Superintendents

Superintendents must incorporate state mandates into a carefully designed district-wide plan that ensures constructivism is implemented in every school. They must ensure that district and school administrators are properly trained in constructivism in order to accomplish these goals. Superintendents are responsible for guaranteeing that the educational plan for the district is clearly communicated to principals who oversee the implementation of constructivist approaches in their schools.

Principals

Principals must be the leaders of change within individual schools. They must integrate district-wide goals into School Accountability Plans that meet the needs of their school populations. In order for principals to do this, they must be knowledgeable in constructivism in order to provide or procure effective professional development that equips teachers with the necessary skills to effect student outcomes in the classroom. In this way they can provide critical feedback informally or formally when observing teachers as part of official evaluation practices. Additionally, it is imperative that principals design schedules to support constructivist approaches into the daily routine of the school day. Finally, principals must purchase appropriate materials to support teachers and students in the process of teaching and learning utilizing constructivism.

Teachers

Teachers must be flexible and adapt to students individual learning needs, styles, and interests. They need to embrace district goals and school-based improvement plans that call for constructivist pedagogy. Teachers must be reflective in their practice and ensure that the culture and environment of their classroom is conducive for teaching and learning using constructivist approaches. Teachers should seek out professional development opportunities in order to become deeply knowledgeable and trained in constructivist approaches to establish a successful learning environment for all students.

Colleges and Universities

Teacher preparation programs at both the undergraduate and graduate levels at colleges and universities have a responsibility to provide their students with a broad range of educational instructional strategies that allow them to be successful in the ever-changing educational environment in our schools. Programs must be reevaluated and updated to reflect the need for teachers who are deeply rooted in constructivist approaches. In addition, colleges and universities must work in collaboration with local schools to provide on-going sustained professional development that includes conceptual knowledge grounded in inquiry, reflection, and participant-driven experimentation. These programs must align with state mandated licensure requirements.

Recommendations for Future Research

This study revealed that leaders need to be invested in creating a culture and an environment conducive for constructivist teaching and learning. Both principals and teachers need to understand the principles and theory behind constructivism in order to implement the approaches with fidelity. More studies are needed, however, to fully understand the effects of

constructivist pedagogy on student achievement. This study focused on school principals of public elementary schools in urban, rural, and suburban areas in Massachusetts. Future studies on the topic should examine principals of other grade levels, charter schools, and private schools. Studies that include larger sample sizes and diverse geographic areas would also be useful. Specific recommendations for future research include:

1. A study focusing on teacher implementation of constructivist approaches. This study relied mainly on the reporting of principals. A study in which teachers are observed implementing constructivist approaches would add further data on the technique's teachers use to develop critical thinking and problem-solving skills. Such a study would also identify the most effective techniques.
2. Studies that explore the perceptions of secondary principals regarding constructivist approaches and the conditions needed to support implementation would provide a larger perspective.
3. A correlational study linked to student achievement based on constructivist approaches would provide further evidence of the effectiveness of constructivist approaches in the classroom.
4. Qualitative or quantitative studies focused on student learning, progress, and evaluations could assess the effectiveness of constructivist approaches.
5. Conduct a study on how principals in K-12 schools implement constructivism in their schools to better understand the most effective techniques for students of different ages.
6. Studies that focus on how principals guide and monitor teachers' learning and growth and how teachers pass new knowledge along to their students.

Final Reflections

The principals in this study provided meaningful data for this research. Their willingness to openly discuss their perceptions and experiences with implementing constructivism provided rich descriptions of instructional approaches within their schools. They gave generously of their time and shared strategies, schedules, professional development approaches, classroom observations, and anecdotes to help clarify their approaches to the constructivist paradigm. As leaders of schools, principals connect the administrative system to the daily learning experiences of students and provide instructional leadership by creating optimal learning environments for students (Ornstein & Levine, 1989). Personally, this research has strengthened and expanded my role as a school leader. Throughout the process, I have found myself engaging as an observer on the balcony (Heifetz, 1994); that is, this research has given me the chance to reflect on the bigger picture, to see things from a new perspective. I have come to realize the importance of district and school administrators who work collaboratively to support effective instructional approaches in their schools.

When I first embarked on this journey, I already believed in the value of constructivist teaching and learning. Now, after concluding my study, I realize the critical importance of this approach for teachers, administrators, districts, and most importantly, for students. Constructivism is not merely a valuable approach to teaching and learning; it is a meaningful quest for knowledge in which learners are guided by their teachers. I have determined that a paradigm shift in the current educational system is critical to improve student learning. Change is a difficult process when it involves significant shifts in beliefs and attitudes, organizational structures, communication, resource allocation, and practices (Avenstrup, 2007). Constructivism requires a shift from an instructional paradigm to a learning paradigm (Barr & Tagg, 1995).

Principal leadership is essential in successfully shifting from an old paradigm to a new. Principals, however, cannot effect this change by themselves. School and district leaders must work collaboratively with state and federal leaders to create a system that is more developmentally conducive to the ways students think and learn if U.S. students are to compete with their peers around the globe. The principals that I interviewed demonstrated that this can be done. They worked diligently to ensure available budgets for students to receive materials necessary to inquire, investigate, and discover. Without the advocacy and support of district and state policy makers, approaches to teaching and learning will not change. The principals interviewed for this study were true leaders. They were courageous, insightful, and forward-thinking. They worked tirelessly to foster constructivist-based approaches to teaching and learning, even though constructivist pedagogy was not common practice. The principals in this study exuded a style of leadership grounded in inquiry, reflection, and action. They ignited creativity in teaching and learning in their schools and created a learning culture that was contagious to everyone they came into contact with. The schools I visited embodied sound teaching and learning. I am grateful to have met and interviewed principals who worked relentlessly to implement instructional strategies beyond traditional approaches to teaching and learning. These principals inspired their staff to challenge conventions in the interest of student knowledge, creativity, and growth. Through their dedication, they empowered students to become life-long learners with the ability to change the world.

Our world is becoming increasingly complex, and in order to best prepare students to meet the challenges of change, we must change the way we educate. Principals, as leaders and visionaries, must be empowered to support and enable learners in embracing their own education. The facts are evident: demands on student learning have shifted from student

improvement to test results as our country continues to lose ground on the educational front. In order for students to be successful, it is imperative for federal, state, and local educational agencies to support principals in gathering the necessary resources to implement constructivism in their schools. The principals in this study provide evidence that constructivism must be an integral part of a school's curriculum if we want our students to succeed.

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Appendix A

Dear Principal,

I am a doctoral student in the Educational Leadership Ph.D. program in the Graduate School of Education at Lesley University. I am conducting research on the role principals play in promoting constructivist approaches in the classroom. I know how busy you are as a principal and I hope you will agree to participate in this study.

This is a two-part study. The first part of the study will involve completing an online survey that will take approximately 10-15 minutes to complete. You are not required to answer every question. Confidentiality will be maintained with no one other than me having access to data stored on my computer, which will be password protected and which only I will have access to the password.

There are minimal risks associated with this research. The exposure of personal vulnerabilities that is a normal aspect of teaching and learning may become heightened through your own sensitivities and knowledge in participating in a survey. Pseudonyms will be used, and all identifiers will be removed upon completion of the study. Participation in this study is voluntary. You are free to withdraw your consent and to discontinue participation at any time without prejudice or consequences.

Some participants will be asked to take part in the second part of the study. The second part of the study will include a semi-structured, (face to face) interview. Participants that consent to be interviewed in part two of the study will receive a $35.00 Barnes & Noble gift card as compensation for their time.

If you are interested in obtaining a copy of the findings of the study, please check the box at the end of the survey. If you have any questions, contact me at 978-771-6012 or email me at *ddaley3@lesley.edu or Dr. Stephen Gould at sgould2@lesley.edu.*

There is a Standing Committee for Human Subjects in Research at Lesley University to which complaints or problems concerning any research project may, and should, be reported if they arise. The Committee Chairperson can be contacted at irb@lesley.edu.

Appendix B

Principal On-Line Survey

1.How long have you been working as a principal?
__1-3 years __4-10 years __11-20 years __ 21+ years

2. How long have you been a principal at your current school?
__1-3 years __ 4-10 years __11-20 years __20-30 years __More than 30 years

3. What grade levels are included in your school?
__K-2 __K-4 ___K-6 ___1-6 __other

4. How many students do you have at your school?
___100-250 ___251-500 ___501-800 ___801-1000 ___over 1000

5. Which of the following best describes your school?
___Urban ___Rural ___ Suburban ___Charter

6. How many full-time teachers are employed in your school?
___1-10 ____11-30 ___ 31-45 ___46-100 ___101+

7. How many part-time teachers are employed in your school?
___1-10 ____11-30 ___ 31-45 ___46-100 ___101+

8. Constructivist pedagogy is important to improving teaching and learning in your school.
___Strongly disagree ___Disagree ___Agree ___Strongly agree

9. I encourage and support teachers to practice student-centered learning in the classroom.
___Strongly disagree ___Disagree ___Agree ___Strongly agree

10. I help teachers implement problem-solving approaches with their students.
___Never ___Rarely ___Sometimes ___Often

11. I help teachers use inquiry-based teaching.
___Never ___Rarely ___Sometimes ___Often

12. Describe the type of professional development you have provided to help support your staff implement constructivist approaches. (Please provide two examples).

13. Teachers guide students as facilitators in the learning process rather than using an overt means of delivering information to students.
___Strongly disagree ___Disagree ___Agree ___Strongly agree

14. I collaborate with teachers in determining constructivist instructional strategies to implement in the classroom.

___Never ___Rarely ___Sometimes ___Often

15. Rate the degree to which you help teachers implement the following constructivist approaches to teaching and learning.

Probing questions
___Never ___Rarely ___Sometimes ___Often

Building critical thinking skills
___Never ___Rarely ___Sometimes ___Often

Meaning making
___Never ___Rarely ___Sometimes ___Often

Collaborating in a social context
___Never ___Rarely ___Sometimes ___Often

Constructing knowledge through discover/inquiry
___Never ___Rarely ___Sometimes ___Often

Creating problem-solving activities
___Never ___Rarely ___Sometimes ___Often

Creating relevant and authentic tasks
___Never ___Rarely ___Sometimes ___Often

Taking responsibility for their own learning
___Never ___Rarely ___Sometimes ___Often

Co-constructing knowledge through social negotiation and shared responsibility
___Never ___Rarely ___Sometimes ___Often

Using Differentiated Instruction
___Never ___Rarely ___Sometimes ___Often

Developing project-based learning activities
___Never ___Rarely ___Sometimes ___Often

Promoting active listening
___Never ___Rarely ___Sometimes ___Often

Getting students to articulate understanding
___Never ___Rarely ___Sometimes ___Often

Helping students reflect on their learning
___Never ___Rarely ___Sometimes ___Often

Utilizing active learning skills
___Never ___Rarely ___Sometimes ___Often

Reconfiguring their classrooms for small group, large group and one-to-one learning
_____Never ___Rarely ___Sometimes ___Often

16. List two or three of the strategies that you are currently implementing with your teachers. (List or bullet)

17. I monitor teachers to ensure that constructivist pedagogy is implemented with fidelity in my school.
___Strongly disagree ___Disagree ___Agree ___Strongly agree

18. Recalling a time when you were helpful to a teacher regarding constructivist approaches describe what you said or did. (Write up to three sentences).

19. I have participated in professional development opportunities to improve my knowledge and skills of constructivist pedagogy.
___Never ___Rarely ___Sometimes ___Often

20. Describe some of the ways you have been able to use your knowledge of constructivism to help teachers? (Please provide two examples)

21. I work as a partner with the district to align curricula standards with constructivist approaches to teaching and learning.
___Strongly disagree ___Disagree ___Agree ___Strongly agree

22. In the space below, describe 2 or 3 factors and conditions that might help you facilitate the integration of constructivist pedagogy in your school.

23. Explain any barriers that hinder your efforts to implement constructivist instructional practices at your school. (Write up to three sentences)

24. If you are willing to participate in part two of the study please supply your contact information below.

Name:
Company:
Address:
Address 2:
City/Town:
State/Province:
ZIP/Postal Code:
Country:

Email Address:
Phone Number:

Appendix C

29 Everett Street

Cambridge, MA 02138

Tel 617 349 8234

Fax 617 349 8190

irb@lesley.edu

Institutional Review Board

DATE: 5/16/18

To: Deborah Daley

From: Dr. Robyn Flaum Cruz & Dr. Ulas Kaplan, Co-Chairs, Lesley IRB

RE: **IRB Number: 17/18 - 055**

The application for the research project, "Perceptions of Elementary School Principals Regarding Their Role in Promoting Constructivist Approaches to Teaching and Learning" provides a detailed description of the recruitment of participants, the method of the proposed research, the protection of participants' identities and the confidentiality of the data collected. The consent form is sufficient to ensure voluntary participation in the study and contains the appropriate contact information for the researcher and the IRB.

This application is approved for one calendar year from the date of approval.

You may conduct this project.

Date of approval of application: 5/16/18

Investigators shall immediately suspend an inquiry if they observe an adverse change in the health or behavior of a subject that may be attributable to the research. They shall promptly report the circumstances to the IRB. They shall not resume the use of human subjects without the approval of the IRB.

Appendix D

INSTRUCTIONS

Good morning (afternoon). My name is Deborah. Thank you for agreeing to participate in this follow-up interview regarding your role in promoting constructivist approaches. As you know, constructivism is a pedagogical approach that helps improve teaching and learning. Your participation in this interview is voluntary and will take approximately 30 minutes. There are no right or wrong or desirable or undesirable answers. I hope you will feel comfortable enough to say what you think and how you really feel.

I will be tape-recording our conversation if you are comfortable with that. The purpose of this is so that I can gather all the details while at the same time carry on an attentive conversation with you. I assure you that all your comments will remain confidential.

CONSENT FORM INSTRUCTIONS

Before we get started, please take a few minutes to read this consent form (Hand Participant consent form & have them read and sign this form if they are comfortable doing so).

Ask participant if they have any questions concerning the consent form or interview? (Answer questions, if any.) After Participant returns signed consent form inform them that may stop at any time if they feel uncomfortable and decide to rescind.

Appendix E

May 2018

Good Morning/Afternoon Principal _____,

My name is Deborah Daley, and I am completing my research on the principal's role in promoting constructivist approaches. This is a friendly reminder asking for your participation in this research study by completing the survey that was emailed to you on May 17, 2018. This survey should take approximately15 minutes to complete online at Survey Monkey. Please complete the survey by May 24, 2018. If you have any questions or concerns, please feel free to contact me at ddaley3@lesley.edu. If you have already completed the survey, I would like to extend my sincere thanks and appreciation for taking the time to participate in this study.

Sincerely,

Deborah Daley
Doctoral Candidate
Lesley University

Appendix F

1. To what extent do you consider constructivism to be critical to the improvement of teaching and learning? Why?

2. Describe the ways teachers use constructivist approaches in your school.

3. What are some of the outcomes of constructivist approaches to teaching and learning?

4. What are some assessments that you use to determine student learning?

5. Considering what you know about the role of principals, how do you think other principals would generally describe their efforts to help teachers implement constructivist instructional practices?

6. How would you describe your level of participation in professional development opportunities to help teachers implement constructivist instructional practices?

7. Please discuss the most effective constructivist instructional approaches used by teachers in your school? (Why do you consider these approaches the most effective? What made them work?)

8. Please discuss the least effective constructivist instructional approaches used by teachers in your school? (Why do you consider these approaches the least effective? Why did they not work?)

9. Please discuss any problems teachers encounter when using constructivist approaches in the classroom? (How are these problems addressed? As principal what did you do about it?)

10. How do you support teachers in using constructivist approaches in the classroom?

11. Any final thoughts? Is there something I didn't ask or something more you would like to say? (Present the gift card to the participant and thank them for their participation. Remind them that their responses will be held in the strictest confidence. Thank the participant for their time.)

Appendix G

Dear _____,

Thank you for agreeing to participate in the interview phase of the study. The first part of the study involved completing an online survey. As a reminder confidentiality will be maintained with no one other than me having access to data stored on my computer, which will be password protected and which only I will have access to the password. Pseudonyms will be used, and all identifiers will be removed upon completion of the study.

The purpose of this study is to find the perceptions of elementary school principals regarding their role in promoting constructivist approaches to teaching and learning. This interview is voluntary, and you are free to withdraw your consent and to discontinue participation at any time without prejudice or consequences. The second part of this study includes a semi-structured, (face to face) interview which will take approximately 30 to 40 minutes. This interview will also be audio taped to allow the researcher to listen more closely to your responses.

There are minimal risks associated with this research. The exposure of personal vulnerabilities that is a normal aspect of teaching and learning may become heightened through your own sensitivities and knowledge in participating during the interview process. You are not required to answer any questions that make you feel uncomfortable.

Upon completion of this interview you will receive a $35.00 Barnes & Noble gift card as compensation for your time. I appreciate your time and your participation is important to this study.

If you are interested in obtaining a copy of the findings of the study, please check the box at the end of the survey. If you have any questions, contact me at 978-771-6012 or email me at *ddaley3@lesley.edu or Dr. Stephen Gould at sgould2@lesley.edu.*

There is a Standing Committee for Human Subjects in Research at Lesley University to which complaints or problems concerning any research project may, and should, be reported if they arise. Contact the Committee Chairperson can be contacted at irb@lesley.edu.

Date	Participant's Signature	Print
Date	Researcher's Signature	Print

Appendix H

List of Tables