8-2023

Bridging the Gap Between High-Stakes Testing and 21st Century Skills

Patricia Gosnell
pmwilli@g.clemson.edu

BRIDGING THE GAP BETWEEN HIGH-STAKES TESTING AND 21ST CENTURY SKILLS

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Education Leadership

---

by
Patricia W. Gosnell
August 2023

Accepted by:
Dr. Hans Klar, Committee Chair
Dr. Jacquelynn Malloy
Dr. Noelle Paufler
Dr. Daniella Hall Sutherland

ABSTRACT

The purpose of this research study is to determine how successful teachers allocate class time between the need for students to meet high-stakes testing and creating a constructivist learning environment that prepares students for real-world careers. In this study, I used an explanatory sequential mixed methods design to explore how much class time teachers of English Language Arts (ELA) and math allow for constructivist activities and direct instruction. The findings showed that teachers of gifted and talented (GT) and advanced classes who use 70% or more of their class time to constructivist learning still successfully have 60% or more of their students meeting the targeted academic requirements. However, students in regular education classes overwhelmingly were not successful on high-stakes tests. Based on the findings from this study, teachers give various student-led learning opportunities throughout the year, but are not varying their usage to meet the academic abilities of students in each class. In addition, teachers reported having time to meet as subject-level educators but stated that the time was primarily unproductive in terms of discussing strategies to enhance student learning. In meeting the demands of both high-stakes learning and 21st-century skills, educators need to understand how class time structures affect learning. Likewise, administrators need to develop effective professional learning opportunities for teachers.

DEDICATION

I dedicate this dissertation to my children, who encouraged, pushed, and supported me when I struggled. Ben, Eli, Sarah Faye, and Maria Grace never stopped believing their mother could reach her goal. I also dedicate this to my mother and father for the wisdom and courage they instilled in me to know that I can succeed with hard work and dedication.

ACKNOWLEDGMENTS

I want to acknowledge and thank Dr. Hans Klar, my dissertation committee chair, for being supportive, patient, and strict when I needed him to be those things. My journey to earn a Ph.D. in Educational Leadership was long. I often wanted to give up; however, I made it through thanks to Dr. Klar's support. Thank you, Dr. Klar.

TABLE OF CONTENTS

Page

LIST OF TABLES AND CHART

CHAPTER ONE

INTRODUCTION

In this study, I analyzed the pedagogical practices of teachers who are successful in meeting both the demands of high-stakes testing and preparing the 21st Century student. For many years, educational reforms focused on improving student learning, teacher accountability, and global competition in the human capital marketplace. From the Clinton administration establishing academic standards (Goals 2000, 1994), to the Bush administration passing No Child Left Behind (NCLB, 2002), then the Obama administration passing Every Student Succeeds Act (ESSA, 2015), the need to prepare students to be productive in a high-tech world drives reform. Yet, although educational reform continues to be necessary for keeping up with societal change, educational practices have left a gap between preparing students to be successful on required state tests and preparing students for the 21st Century.

The emphasis on teacher and administrator accountability has attached educators' job security to test scores (Wurdinger, 2012), which has led to the phenomena of teaching to the test. Teaching to the test often describes instruction focusing on specific skills assessed on a test. For this study, I will use the terms teaching to the test and direct content instruction for instructional practices where the teacher focuses on lecturing rather than facilitating learning. Teachers may focus on this type of instruction to ensure improvement in test scores (Jenning & Bearak, 2014; Popham, 2008). However, educational reform established in the United States' educational system created a need for

a constructionist type of teaching and learning (Yager, 2000; Wurdinger, 2012). Constructionist practices allow students to guide learning through discovery (Bruner, 1961; Elliot, 2000; Yager, 2000). The constructivist classroom model turns the learning over to the students while the teacher is a facilitator. In this study, I assess how teachers allot time between direct content instruction to meet the demands of high-stakes testing and constructivist learning to prepare students for the 21st Century.

In Chapter One, I explain educational reform and how globalism helps create a shift to using standardized test scores for evaluating the effectiveness of school administrators and teachers. In the following three sections, I describe the problem of meeting the demands of high-stakes testing and educating the 21st Century student, the purpose of the study, and its significance. Next, I define important terms used throughout the report. I follow the definition of terms with an explanation of the theoretical framework supporting the study. Finally, I end the chapter with the research questions and discuss the delimitations, limitations, and assumptions involved in designing the study.

Overview

The Global Education Reform Movement (GERM) helped develop educational reform in the United States due to a neoliberalist idea of education (Verger, 2019). Neoliberalists believe that an individual's education should focus on their future economic contributions. In addition, the globalization of education ushered in need for teacher accountability through assessments. Under GERM, administrator and teacher

accountability for student growth is monitored by local and state policy makers (Sahlberg, 2016).

Responsibility for meeting the demands of education reform migrated from the federal level when the Bush administration enacted No Child Left Behind (NCLB, 2001) to the state level when the Obama administration replaced NCLB with Every Student Succeeds Act (ESSA, 2015). To ensure student success, both pieces of legislation focused on high-stakes testing to evaluate teacher and administrator effectiveness. Unfortunately, test results can add consequences such as loss of funding, employment, or accreditation for schools and districts when they do not show adequate academic growth (Olmedo & Wilkins, 2017).

Another push for globalized educational reform is to teach soft skills such as collaboration, problem-solving, creativity, and communication. The Partnership for 21st Century Skills (P21) lobbied legislators and academic leaders to create a curriculum to enhance these soft skills (2008). The goal of P21 was to ensure students were ready to enter today's workforce.

In this study, I focus on South Carolina, so it is crucial to understand how the state meets ESSA and P21. In 2017, South Carolina legislators added a value-added system when evaluating educators' and administrators' job performance (S.C. General Assembly Education Oversight Committee). As a result, eleventh-grade students must take a college and career-ready assessment that includes real-world math and reading for information (S.C. Department of Education, 2020). South Carolina is meeting the globalized approach

to education by changing best practices in the classroom by creating a paradigm focused on test scores and 21st Century soft skills.

Statement of the Problem

Educational policies enacted by federal and state legislators to raise academic achievement for all students while preparing them for college and careers have created a discrepancy in pedagogical practices in the classroom (Gonzalez et al., 2017). Many states evaluate teachers under a value-added accountability system (Harris, 2011). The value-added accountability system creates consequences for educators and administrators based on test results. These consequences can lead to teachers feeling they must focus on teaching to the test to ensure students' scores increase and meet adequate yearly progress goals since their effectiveness as an educator is growth in test scores. As a result, some classroom teachers tend to focus on instructional strategies such as rote memorization through worksheets and repeated practice of answering test-like questions to prepare students for the test. (Firestone et al., 2004; Wurdinger, 2012). This type of instruction is teaching to the test.

In addition to raising student test scores on standardized tests, the Profile of a South Carolina Graduate (S.C. Council on Competitiveness, 2015) requires teachers to use instructional strategies that promote P21 skills. These include communication, collaboration, creativity, and innovation. P21 skills come from constructivist approaches such as discovery learning to enhance soft skills of critical thinking, collaboration, and creativity through student-centered classrooms (Trilling & Fadel, 2009). Constructivist

teaching focuses on students becoming successful in using soft skills while learning or discovering content knowledge.

Teaching strategies and assessments designed to evaluate growth in learning soft skills differ significantly from those currently used in most schools. For example, because of state assessments designed to assess content knowledge only, teaching to the test often limits the number of times teachers allow students to be self-directed learners while practicing soft skills needed for the 21st Century student.

It is necessary to understand the dynamics of both direct content instruction and constructivist learning strategies to understand the disconnect between current educational reform and the reality of classroom instructional practices. Teachers are left to discern how to balance limited class time between preparing students for a test and preparing the 21st Century student. To ensure the best learning environment for all students, educators must understand the best balance between the two forms of instruction.

Purpose

In this study, I aim to analyze the pedagogical practices of teachers who are successful in meeting both the demands of high-stakes testing and preparing the 21st Century student. In the study, I assess how successful teachers allocate instructional time between direct content instruction with practice and constructivist learning opportunities through teacher surveys and interviews. For this study, I defined a successful teacher as having at least 60% of the students they teach meet targeted growth. I used teachers'

responses to open-ended questions about classroom practices to develop a list of instructional tools successful teachers use to meet the demands of the 21st Century student. Finally, I used teachers' responses to survey items to help explore teachers' perspectives of successful actions by building-level administrators to provide adequate support in developing the 21st Century learning environment.

Significance

Educators must equip themselves with strategies to meet the demands of current educational reforms. Understanding the classroom practices of successful teachers will add knowledge to enhance teacher preparation and curriculum development. Examining the practices of teachers whose students consistently show adequate yearly growth while receiving constructivist learning opportunities helps administrators design academic learning environments and professional development topics. Interviewing teachers about their classroom practices and building administrator support gives practical insight into allocating time between direct instruction and the constructivist learning style. Overall, the findings from this study can help administrators develop a 21st Century learning environment.

Definition of Terms

Definitions of critical terms help illustrate the significance of the discrepancy between the two pedagogical practices created by educational reform.

Constructivism is the belief that learning comes from life experiences (Ertmer & Newby, 2013). Under the constructivist's umbrella of teaching, discovery learning is

inquiry-based learning where students use their active schema to make sense of the world (Bruner, 1961). For this study, constructivist learning refers to classroom activities where the students lead their own learning, and the teacher acts as a facilitator.

Direct content instruction with practice refers to instructional practices that closely follow state standards while focusing on specific skills (Popham, 2008). For this study, direct instruction refers to the teacher leading the instruction with lecture and demonstration followed by student practice.

Another term used to describe direct instruction of content is teaching to the test. Teaching to the test is a catchphrase that describes all practices directly related to preparing students for state assessment success.

21st Century skills are those defined by The Partnership for 21st Century Skills (P21) as critical thinking, communication, collaboration, innovation, and problem-solving (2008). The P21 consortium felt these were skills all students needed to compete and thrive in the world workforce.

High-stakes testing refers to a testing program when the test results affect graduation, and administrator evaluation, and possibly even employment (Menken, 2017).

A successful teacher is a term used to describe a teacher with 60% or more of students' test scores showing adequate yearly progress based.

Academic growth refers to the state’s or district’s recommended increase in the

individual's test score. Recommended growth is not a fixed rate for all students. For this reason, meeting targeted growth is equal in difficulty for all academic levels.

Academic Learning Time (ALT) is when students are actively and successfully engaged in learning academic content. This term differs from simply being on task because it includes engagement and success in reaching the targeted learning objective (Squired, Huitt, & Segars, 1983).

Professional learning communities (PLCs) are educators working together to reflect on best practices, curriculum, lessons, and results (Dufour, 2004). PLCs can be grade-level groups of teachers, subject area teachers, administrators, or stakeholders working to improve the school's educational practices.

Theoretical Framework

Under the Clinton administration, creating academic standards ensured all students learned the skills necessary to succeed in society (Goals, 1994). With the passing of No Child Left Behind (2002), school administrators and legislators began to focus on test scores to gauge teacher effectiveness. In place of balancing instruction between life skills and academic skills, teachers began to focus more on the direct instruction of standards to ensure student growth as measured by test scores (Wurdinger, 2012). With the rapid advancement of technology, businesses stressed the importance of preparing students for the 21st Century workforce. Education again changed to embrace the 21st Century skills recommended by the consortium of industry leaders, educators, and

legislators (Partnership for the 21st Century Skills, 2008). Each area of education creates unique and opposing classroom dynamics.

Direct content instruction with the test-like practice of teaching standards, or teaching to the test, focuses on one correct answer, one way of thinking, and one reasoning mode (Bearak, 2014). High-stakes testing forces teachers to practice this cognitivist way of thinking. State standardized tests have only one correct answer. The teachers must produce students' mastery of the standards' skills to satisfy adequate academic growth (Craig, 2012; Farvis & Hay, 2020; Gonzales et al., 2017; Jennings & Bearak, 2014; Vaughn, 2013). Kivunja (2014) described direct instruction as teaching the basic skills to master specific standards.

On the other hand, some business leaders understand the disconnect between direct content teaching and success in current jobs. The discrepancy caused a shift in classroom practices to include lessons that promote communication, collaboration, and critical thinking (Heinrich et al., 2015). Changing types of instructional practices fall under the epistemology of constructivism. These practices include inquiry or discovery learning techniques.

Bruner (1961) defined discovery learning as a constructivist theory where students develop knowledge through experiences and existing knowledge. Constructivists believe knowledge is fluid and changes with personal experiences (Ertmer & Newby, 2013). Knowledge acquisition's conflicting beliefs create difficulty in meeting adequate student academic growth and future employers' demands. Constructivist learning includes

students' self-paced learning activities such as discovery learning, projects, and research. These practices take considerable classroom time, which some teachers feel takes away from needed direct instruction in preparing students for high-stakes testing (Baker et al., 2008; Ward, 2001). In addition, teachers feel pressured to spend a lot of time preparing students to succeed on high-stakes tests. Constructivist type learning, such as discovery learning, is time-consuming and can cause misapplication of the skill if the teacher properly guides students through self-learning (Mayer, 2004). Administrators and teachers must understand how to meld the two theories into a thriving constructivist learning environment.

Time allotment for each method of instruction is important because active learning and Academic Learning Time (ALT) are key predictors of student success. (Fisher et al., 2015). For this reason, in this study, I will assess the time spent on each type of instruction to assess the optimum allocation of time between direct content instruction and constructivist typing learning to improve student academic success.

Research Questions

I used the following research questions to guide this study and determine the best classroom practices in meeting the demands of high-stakes testing and preparing the 21st Century student for today's careers:

1. How do selected classroom teachers allocate instructional time between direct standards-based instruction and constructivist teaching practices while maintaining adequate student growth measured by SCReady and MAP?

2. What types of pedagogical practices are teachers using to meet the demands of the 21st Century S.C. Graduate?
3. What are school-level administrators doing to help classroom teachers provide opportunities for constructivist learning practices?

Delimitations

This study has two delimitations. The first delimitation is that I only used math and ELA teachers in the study because the participating district only assesses these subjects using SCReady and MAP. Finally, I limited participants to middle school teachers because students at this level of education are developmentally ready to learn 21st Century skills (Kay, 2009). SCReady and MAP to assess student growth end at the participating district's ninth-grade level.

Limitations

The study has the following limitations. First, the sample of teachers in this study is from one rural district, and participants are from a convenient sample in a district the researcher is familiar with. The results may not reflect student performance and teacher practices in schools in other districts. Secondly, only middle school teachers participated in this study. Inviting participants eliminates other teachers who may skillfully use both pedagogical practices but whose school's socio-economic demographics negatively impact test scores more than teacher practices.

Although these limitations exist, the study is still significant in that it gives insight into how teachers are meeting the demands of high-stakes testing and 21st Century skills.

Moreover, this pedagogical paradigm is not unique to rural schools or South Carolina. Administrators and teachers across schools in every state of the United States are responsible for producing successful 21st Century students. Therefore, adaptations from this study can be helpful in any school setting.

Assumptions

The following assumptions guide my research. First, the data gathered from the assessment tools are free from error. The participants respond to the survey questions accurately concerning the time allocation for each type of instruction. Finally, the participants understand the definition of direct content instruction and the discovery learning constructivist teaching strategy.

Organization of the Study

The research study has five chapters. In Chapter 1, I develop the study's background, including the problem, purpose, and significance. In Chapter 2, I review the literature on educational reform, high-stakes testing, and constructivist learning. In the literature review, I discuss direct standards instruction and discovery learning needs. I conclude the chapter by discussing the theoretical framework for the study's foundation. In Chapter 3, I explain the methodology for the research study, which includes selecting participants, the design of the instruments, and the steps in collecting and analyzing of the data. In Chapter 4, I present the study findings. Finally, in Chapter 5, I include a summary of the research, a discussion of the results, implications for administrators and teacher practices, and recommendations for further study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Since the publication of *A Nation at Risk* (U.S. National Commission on Excellence in Education, 1983), policymakers have focused on teacher accountability to improve student learning. The Clinton administration established educational standards for which educators are accountable for student mastery of the skills. (Goals 2000, 1994). In 2002, George W. Bush signed the No Child Left Behind Act (NCLB) to reduce the achievement gaps between socio-economic levels while increasing teacher accountability (NCLB, 2002). This act increased the federal role in education to ensure that the United States remained a leading competitor in the international economic market. The idea was to hold teachers accountable by assessing the growth of students measured by state tests. President Obama replaced NCLB with Every Student Succeeds Act (ESSA, 2015) to give states more authority to hold educators accountable for students' academic growth while preparing them for college and career success. These educational reforms emphasized high-stakes testing, which is when test scores have outcomes that dictate graduation, grade level advancement, educator evaluation, and possible employment (Menken, 2017).

Educational reforms adopted by the United States over the last 40 years grew from neoliberalism into the Global Education Reform Movement (GERM) (Robertson, 2012; Sahlberg, 2016; Verger et al., 2019). Neoliberalism frames education as an investment in human capital. What and how students receive instruction relates to their

future contributions to society and the workforce (Apple, 2017; Hastings, 2020). Globalization situates education as preparing students for world economic and career competition.

Three unified policies within globalization in education are accountability, standards, and decentralization. According to GERM, high-stakes testing, or national large-scare assessments (NLSA's), ensures schools achieve defined learning standards (Sahlberg, 2016). NLSA's results are reliable for holding schools and administrators accountable for student academic growth. Concrete scores are easy to obtain, analyze, and compared (Verger & Parcerisa, 2018). NLSA's results are public, narrowing neoliberalism and globalization's competitive drive down to the State and community realm. The attachment of consequences to individual districts, administrators, and teachers is common (Olmedo & Wilkins, 2017). Parents can use the results to decide where their child should go to school, while businesses can use the same data to determine where to locate growth facilities (Baird & Elliott, 2018).

Another program adopted by the United States related to the push for globalized educational reform is The Partnership for 21st Century Skills (P21). This organization began in 2001 and comprised business owners, educators, parents, and government representatives. The goal of forming P21 was to create a movement among federal and state education policymakers to increase the rigor of curriculum standards to ensure all students prepare for college and careers. The required skills established by P21 focus on soft skills of creativity and innovation, critical thinking and problem solving, and communication and collaboration (2008). P21 intends to ensure all students can be

successful and competitive in the world workforce market. Framing education as an investment in human capital, P21 aims to create more productive employees.

Requirements for High-Stakes Testing and 21st Century Education in South Carolina

My research population is from a rural district in South Carolina. For this reason, it is crucial to understand educational reform policies within the state. The South Carolina Board of Education (2015) adopted the S.C. College and Career Ready Standards to meet the demands of educating the 21st Century student. Inquiry-based literacy standards are now part of each discipline. This section focuses on skills such as generating questions for investigation, transacting with text, synthesizing information, and reflecting on learning. The addition of inquiry-based learning also meets the 21st Century Student requirements in a globalized education system.

In 2015, the South Carolina Department of Education adopted the TransformSC Profile of a Graduate (S.C. Council on Competitiveness). In 2016, South Carolina legislators added a requirement that all 11th-grade students take a college and career exam (S.C. General Assembly, 59-18-235). In addition, South Carolina uses Ready to Work (R2W) and Essential Soft Skills (ESS) assessments (S.C. Department of Education, 2020a). These assessments evaluate the students' understanding of applied mathematics, locating information, and reading for information. Included are evaluations of using soft skills requirements of P21. South Carolina Governor Nikki Haley signed a bill in 2017 to form the educational achievement goals established by P21 and the Profile of the S.C.

Graduate (S.C. General Assembly, §H3969). The amendment explicitly states the same skills as outlined by P21 in preparing students for college and career readiness.

South Carolina legislators added an amendment to the 1976 Education Accountability Act to include implementing a value-added system for evaluating educators based on student growth (S.C. General Assembly, 2017). As a result, the S.C. Board of Education uses value-added measures (VAM) and student learning objectives (SLO) to evaluate school administrators and teachers. Both are the basis for assessment tools on student academic growth as measured by the SCReady exam (S.C. Department of Education, 2020b). Assessment results compare students' scores for the current academic year to the same students' scores from the previous year. In districts using SLOs, assessment tools such as the Measure of Academic Progress (MAP) test evaluate student growth.

Meeting Requirements of Global Education

One aspect of GERM is to use outside sources and companies to create assessment tools for evaluating educators. For example, the Data Recognition Corporation (DRC) developed the SCReady exam (S.C. Department of Education, 2020). In addition, Northwest Evaluation Association (NWEA) owns and produces the MAP test (nwea.org). Independent developers of state assessments for student academic growth increase the likelihood of a common standard of assessment required by GERM (Sahlberg, 2016).

School reform is not a new concept and is usually related to economic and social change and upheaval. (Rose, 2015). President Obama signed the STEM Education Act (2015) to ensure that the United States stayed competitive with the world's science and math education growth. This law pushed educators to provide the constructivist theory of learning opportunities in students' educational experiences. A plethora of research highlights the necessary skills that current students will need to be productive members of society (Jerald, 2009; Partnership for 21st Century Skill, 2008; Trilling & Fadel, 2009; Wurdinger, 2012).

Challenges at the School Level in Meeting the Demands of Both testing and 21st Century Learning

Teachers are primarily responsible for instilling 21st Century students with problem-solving skills, collaborating effectively, and thinking creatively to help solve new and unique challenges. Although these are paramount needs in preparing our future workforce to solve global challenges, educators often must spend valuable time raising standardized test scores. Job security in a teacher's current position may depend on student learning as measured by test scores (Wurdinger, 2012).

Consequences are attached to individual districts, administrators, and teachers. School leaders often face sanctions if the school district (or individual schools within that district) does not meet adequate yearly progress in raising student test scores (Croft et al., 2016; Olmedo & Wilkins, 2016; Rose, 2015). These sanctions may result in government control of the institution or reduce funding for public schools in the state or individual

districts. Unfortunately, high-stakes tests have severely restricted teacher pedagogical practices, leaving teachers frustrated and hesitant to employ new and innovative teaching practices that can exponentially affect student progress and learning. (Craig, 2012; Farvis & Hay, 2020; Gonzalez et al., 2017; Morgan, 2016; Vaughn, 2013).

In the study, I address balancing the need to prepare 21st Century students through constructive learning practices while meeting high-stakes testing demands through direct content instruction. Specific pedagogical practices for preparing students to succeed in the real world differ significantly from those needed to prepare students for high-stakes testing. For example, the oft-used phrase 'teaching to the test' adequately describes instructional focus, closely following curriculum standards while directing instruction towards a specific skill set within a test (Popham, 2008). In contrast, constructivist learning involves teachers encouraging students to be active learners through hands-on learning, problem-solving, critical thinking, real-world application, and group collaboration (Yager, 2000). Because constructivist learning requires significant class time, teachers often struggle to discern how much time to spend on constructivist lessons and how much time to devote to teaching explicit content to ensure high test scores (Baker et al., 2008).

Literature Review Format

In this literature review, I explore the pedagogical practices involved in each teaching style. I cover five focused topics. In the first section, I examine how teachers strive to meet the ongoing demands to raise student test scores. I use previous research to

demonstrate how 'teaching to the test' plays out in the classroom for both the teacher and students. Included is an evaluation of the strengths and weaknesses of direct content instruction. In the second section of the literature review, I develop a working definition of the constructivist form of learning. It meets students' demands in the 21st Century while demonstrating its practical applications for students and teachers. I included an evaluation of the strengths and weaknesses of constructivist learning pedagogy in this section. Next, I examine the need for both teaching types to create a successful educational program. In the fourth section of the literature review, I discussed the importance of time allotted in the classroom when planning direct content instruction and constructivist learning activities. In the fifth section of the literary review, I explore how school-level administrators help teachers meet high-stakes testing demands while providing constructivist learning opportunities such as discovery learning. In the review's final section, I focused on theoretical constructs shaping today's classroom practices and the need for further research.

Meeting Accountability Demands (Teaching to the Test)

High-stakes testing propels instruction within the classroom toward a narrow focus on specific skills and knowledge assessed on state-mandated tests. Teachers attempt to meet high-stakes testing demands through structured lessons designed to saturate students with content knowledge based solely on state standards when teaching to the test. Popham (2001) explained that teaching to the test results when educators structure lessons and classroom assessments to match a particular test's questions. He called this practice item teaching. Teachers develop studies and design classroom

assessments replicating the state's normative exam language and format during item teaching.

Teachers may choose a procedural, or conceptual, approach to instruction in their classroom. A procedural approach to teaching is more prevalent in a high-stakes testing environment than a conceptual approach (Guinn et al., 2016; Jones & Egley, 2004). A procedural instruction approach primarily employs memorizing terms, reviewing content skills, mimicking test-taking environments, and practicing specific test-taking strategies. Students work simultaneously, complete worksheets, follow a sequence of tasks, and answer specific test questions similar to those they are likely to encounter on the test. Students typically practice a skill or a concept until they master the craft. The standard definition of content mastery in a class setting is when 80% of the students score 80 or higher on an assessment (Guskey & Anderman, 2013).

In addition, teachers often use a lecture format when preparing students for testing because it is the most efficient way to cover the massive amount of content defined by curriculum standards (Firestone et al., 2004; Jennings & Bearak, 2014; Li & Yong, 2018; Phelps, 2016; Popham, 2008; Wurdinger, 2012). After teachers spend considerable time giving direct content instruction, some may have students complete worksheets for repeated review, memorize vocabulary from the standards, practice test questions from prescribed formats, and practice multiple-choice question tests (Popham, 2008; Wurdinger, 2012).

Anderson (2012) found that teachers emphasized skills they knew would be on the state assessment while reducing instructional time on those they perceived would be less assessed. In a separate study, up to 64% of teachers surveyed admitted that they omitted material they knew would not be on the state test because of the lack of sufficient time to cover the material (Moon et al., 2002).

Jennings and Bearak (2014) described teaching to the test as focusing on test-taking skills outlined by the assessment tool developers. They explained that teachers narrow their instructional practices to three domains of instruction. First, instructors must align their lessons strictly to state standards. They gave the example of implementing a new standard related to specific content; the teacher must then reallocate lessons to incorporate this new standard skill. The teacher then ignores another standard or reduces the time spent on that standard. Secondly, the instructor must schedule the time spent on each skill to align with the number of questions on the test for that skill. A final common practice in teaching is designing the classroom assessment for each standard, mirroring the high-stakes test format.

The practices described by Jennings and Bearak (2014) may look like school districts spending a lot of professional development time preparing teachers for standards-based instruction. For example, a state's department of education will often release reports showing student' average strengths and weaknesses from the previous school year's test results. Then, as demonstrated by student scores, administrators may use these reports to design in-house professional development that focuses on their school's shortcomings. For instance, if a school's report shows that students were weak in

informational text, administrators could provide extra support through training and resources to teach the standards addressing informational texts.

Teachers may receive instruction on what testing questions look like and how to design classroom assessments to reflect the test question format. South Carolina educational leaders at the state level release information before the testing date. South Carolina educators use the SCReady exam for state English Language Arts (ELA) and math testing for grades 3 through 8 (S.C Department of Education, 2020c). The state exam is a secure test, meaning administrators and teachers cannot see the test questions before or during the exam. However, the developers of SCReady, Data Recognition Corporation (DRC), provide a blueprint for the current year's assessment tool so that administrators and teachers know the number of questions for each skill and the associated points allotted to that skill (SCDOE, 2020d). In addition, released questions from previous years for all exam areas are available for educators to use in preparation for the test.

Releasing the test blueprint and practicing writing prompts is not bad; however, it increases the availability of resources to teach to the test. Thomas (2005) stated that several studies have shown that students fail or score poorly on state tests because they do not have adequate instruction for all the test material. Releasing a blueprint of test questions provides the opportunity to cover the skills on the test explicitly; while increasing the need to focus on those skills.

Direct Content Instruction Advantages and Disadvantages

Some researchers found that direct instruction is best for academic mastery skills (Li & Xiong, 2018, Phelps, 2016, Stockard et al., 2018). Others warn of depending too much on one type of instruction (Bakker, 2018). In developing the best learning environment for all students, education should look at instructional practices that work to capitalize on their existing advantages. Likewise, educators should avoid the disadvantages or pitfalls of focusing solely on one instructional method. Providing a well-rounded educational experience should be the goal for all schools.

Advantages of Direct Content Instruction Through a Procedural Approach

Direct content instruction helps raise test scores on standardized tests (Li & Xiong, 2018; Phelps, 2016; Thomas, 2005; Stockard et al., 2018; Wurdinger, 2012). Stockard (2018) found that students retain information best when the teacher explicitly shares unambiguous information. Using test scores for teacher and administrator accountability is a reality for many educators today. Classroom teachers have demonstrated that using 'teaching to the test' strategies to instill fundamental skills knowledge can be a practical instructional method.

Disadvantages When Focusing on Direct Content Instruction Through a Procedural Approach

Unfortunately, using this instruction modality across all settings deters creative thinking, problem-solving, and self-directed learning (Wurdinger, 2012). This method reduces motivation to express self-awareness in learning and stifles the freedom to

explore unique ideas. Wurdinger (2012) stated that students have become complacent while expecting teachers to give them answers. Some assessments ask students to find answers to a specific question without engaging their thinking and unique problem-solving strategies.

The stress of preparing students for high-stakes testing diminishes opportunities for higher-level thinking skills (Adamson & Darling-Hammond, 2014). A study of standardized tests in 17 states by Yuan & Le (2012) found that only 2% of math questions and 21% of ELA questions reached higher-order thinking levels. Instructional practices in the classroom diminish even the authentic answer to the small number of high-order thinking questions. Students in the class may receive testing prompts that mirror the state assessment's questions involving higher-order thinking skills like analysis. The teacher may use direct instruction on answering the prompt, then allow students to practice the skill. But, again, the teacher has taught directly to the test. Relying solely on instructing to raise test scores leaves the students with a one-dimensional education experience that lacks discovery, creativity, and self-awareness.

Learning Through the Lens of Constructivism

Constructivists believe learning is a discovery process through life experiences (Elliot, 2000). Students make meaning of information through exploration and actively participate in learning. Constructivist learning falls under the umbrella of problem-solving through critical thinking. Bruner (1961) first defined discovery [constructivist type] learning as an active learning process in which students use their mental schema to

obtain and utilize their world knowledge. Dewy (1938) described the learning process as one of inquiry. Schwab (1960) introduced inquiry learning as a pedagogical practice associated with discovery learning. Whereas constructivist learning starts with a fact or a means to reach a conclusion, students find facts and connect them to develop understanding in inquiry learning. In this literature review section, I focus on discovery learning as a pedagogical practice of constructivism.

Constructivist learning entails a research process where students use their prior knowledge and new experiences to answer or solve a problem or an essential question (Bruner,1961). Discovery learning, project-based learning, and problem-based learning are all pedagogical practices in which the teacher becomes more of a facilitator instead of focusing on instruction. The teacher guides students without answering the overarching question, which would impede the student-led discovery process. Therefore, the students become active learners through research, discovery, and problem-solving (Bell, 2010; Hunt, 2010; Wurdinger, 2012; Yilmaz, 2011).

Reasons a Constructivist Classroom is the Best for Learning 21st Century Skills

A constructivist-based classroom provides opportunities for students to experience self-directed learning. In a world where technology and businesses are consistently changing, students need to know content skills and how to adapt the knowledge to the changing world (Whitt & Ulmer, 2010.) Vygotsky (1962) stated that learning is an active process. Constructivist learning allows students to discover new knowledge while building on prior knowledge. 21st Century skills focus on using soft

skills while constructing knowledge. Wurdinger (2012) stated that students learn problem-solving skills by developing plans and implementing actions, collaboration skills by working with peers, transference knowledge skills by working through real-world problems, and critical thinking skills through evaluation and creating. Constructivist learning and the development of 21st Century skills rely on students being self-directed learners, problem solvers, and collaborative participants.

Constructivist Learning Methods

Constructivist learning prepares students for a rapidly changing world. Four methods for designing a constructivist learning classroom are project-based learning, collaborative learning, problem-based learning, and service-learning (Wurdinger, 2012).

Problem-Based Learning. Problem-based learning (PBL) involves students working in groups to identify and solve a problem through a problem-solving process. Then, they design a plan to address the specific challenge, develop a plan of action for solving the problem, and test the plan's solution against a real-world situation (Bell, 2010; Kokotsaki et al., 2016; Wurdinger et al., 2007). Project-based learning uses real-world problems to make the learning process as authentic to students as possible. An example of PBL would be assigning students the challenge of exploring the repercussions of censorship in today's society. This unit could originate in a history class while utilizing the assistance of an ELA instructor.

In PBL, the teacher must scaffold learning to reduce cognitive overload and promote growth through small steps (Bell, 2010; Hmelo-Silver et al., 2007). Cognitive

load relates to active working memory, which is the amount of actively used information at one time. Students who have not stored enough background information for content skills become overloaded with information and cannot complete a task. Teachers preface the PBL experience with direct skills instruction for those needed to complete the assignment. The teacher would need to unpack the project to assess the required skills. Teachers may need to instruct in research skills, analyzing content literature, or evaluating resources and references for reliability.

PBL units allow instructors to provide a list of project ideas or give students the option to find their project ideas (Wurdinger, 2012). The class's age group, ability level, and time restraints often determine the teacher's instructional practice. PBL promotes collaborative learning, self-directed learning, and authentic experiences through real-world issues. Whether the teacher gives research ideas or allows self-selection does not detract from the discovery experience.

Collaborative Learning. Collaborative learning involves students working in pairs or small groups to discuss topics, solve problems, or debate varying views on a specific topic. This pedagogical process creates a democratic classroom by encouraging students to share ideas and opinions (Barkley et al., 2014; Brookfield & Preskill, 2012). The teacher provides the essential question and allows students to derive answers through discussion. Using the collaborative learning approach, the teacher may facilitate strategies like think-pair-share, critical debate, fishbowl, jigsaw, and peer editing (Wurdinger, 2012). These are just a few examples of collaborative methods to promote discussion and team among students.

Other collaborative methods for promoting discussion include think-pair-share, critical debate, fish bowl, jig saw, and peer-editing. Think-Pair-Share occurs when the teacher poses an open-ended question to the entire class. First, each student has time to think about the problem; then, the teacher asks the students to discuss possible answers with a partner. After discussing ideas with their partner, students will share their thoughts or answer the posed question during a whole-class discussion. A critical debate is when the instructor presents an argumentative topic to the class, then divides the class into a pro and con team. Each team develops an argument with supporting facts to bring to a debate table. Finally, the student will hold a Socratic Debate session to discover a clear understanding of the topic.

The fish bowl instructional practice is when students sit in an inner circle surrounded by making an outer ring. The teacher presents the students with a topic to discuss. While the internal group discusses the subject, the external set of students takes notes. After several minutes of discussion and notetaking, the students in the outer group share their reports. Again, the students discuss topics while gaining peer insights and opinions that develop critical understanding.

The jig saw is a strategy where the teacher selects students to instruct the rest of the class about specific topics. The students divide into small groups, and the teaching students rotate among the groups to share their knowledge of a particular content term or skill. For example, the Jig Saw strategy may look like a study of literary terms where individual students master one term's concept as it applies to a story. Then students share their understanding of the definition and application of the academic term. Another

method for using Jig Saw is dividing the reading of a chapter in a content area's textbook or dividing chapters of a novel. In the order of the book, the students share what they learned from their section of reading.

There are two methods to establish Peer Editing in the classroom. One approach is to assign pairs of students a topic, give them several resources, and ask them to write a formal paper combining the information they learned from them. Another approach is to have each student write a report or story and then have a peer edit the piece. This practice of collaborative learning also promotes peer tutoring.

Problem-Based Learning. Problem-based learning is closely related to project-based learning in that students develop a research topic, carry out the research, and develop products. The difference is that in problem-based learning, the students must select a problem to solve rather than the teacher providing choices for research. In a problem-based environment, the students work in groups to choose a real-world problem, develop research questions, and produce solutions (Maxwell et al., 2005). Problem-based learning began in the medical field to train doctors; however, all levels and areas of education use this instructional style (Sorrel & Ramsay, 2007; Wurdinger, 2012; Yew & Goh, 2016).

In problem-based learning, the group members discuss what they already know about the problem and then list what they need to find to develop a plan for solving it. The research portion of the unit takes the most time. Students must find enough information about the issue and steps to solve the problem before formulating and

producing a solution. An example of problem-based learning could be during a philanthropy unit in an ELA class, Social Studies class, or Science class. The optimal learning environment would be to incorporate all subjects in the project. The students research a situation they perceive as a problem at their school or community. The group would self-select the topic, analyze the problem's parameters, and then develop a solution. This pedagogical practice closely resembles practices in today's companies. Companies often gather people with varying skill sets to work on solving problems within the organization.

Service Learning. Service learning is the practice of enriching classroom learning by emphasizing serving the broader community. The experience helps the community while providing students time to reflect and demonstrate academic skills (Kaye, 2004). Assisting the community creates a sense of responsibility and purpose between classroom learning and the community's needs. Students understand that they can directly impact their local communities and become more invested in their schoolwork by seeing how it helps the larger community solve problems. The service project gives students personal ownership of their academic progress. (Billig, 2000; Soslau & Yost, 2007; Wurdinger, 2012). An instructor may or may not provide a selection of topics for this unit. Students discuss perceived needs within their area or at their school. Then working in groups, the students develop a plan to help meet their school's requirements or the community's needs. Although very similar to the example given for problem-based learning, this pedagogical practice focuses on providing community service rather than solving a problem.

Advantages and Disadvantages of Constructivist Learning Practices

Constructivist learning practices are the best method for teaching 21st Century skills. However, students must still master academic skills (Abrahamson & Kapur, 2018; Heinrich et al., 2015; Wagner, 2014). As with many teaching practices, constructivist learning has advantages and disadvantages. Educators need to be aware of both in developing the best methods for providing the best learning opportunities.

Advantages of Constructivist Learning

Using constructivist learning theory to provide discovery learning opportunities allows students to engage in learning actively. It changes the focus of learning from answers to questions while giving authentic situations for problem-solving, critical thinking, and hands-on learning. When students discover concepts, they are more likely to remember them and transfer their knowledge to other content (Ormrod, 1995). A constructivist learning approach to education meets the challenges of preparing students for the 21st Century workforce and society. It promotes communication, creativity, leadership ethics, accountability, and social responsibilities (Newell, 2003; Wurdinger, 2012).

Disadvantages of Constructivist Learning

The disadvantages of constructivist learning are that it can overwhelm and confuse students if they do not establish a robust skills framework before attempting the task alone. Teachers must scaffold information and learning to build the skills framework for each project's tasks. Discovery learning can be very time-consuming and lead to confusion and misapplication of the essential knowledge if not properly guided by the

instructor. Teachers often report that scheduling and limited classroom time are severe drawbacks to using constructivist-type lessons (Baker et al., 2008; Ward, 2001). Teachers must address wrong conclusions and guide students through a trial-and-error discovery process toward a correct decision (Mayer, 2004). This aspect of constructivist type c learning may increase teachers' likelihood of not using this instructional approach due to pressure to teach to the test.

The Need for Both Pedagogical Practices

All educational systems must prepare students for 21st Century careers and increasingly complex social and societal demands. Trilling & Fadel (2009) stated that education plays four critical roles in preparing students for 21st Century jobs: "It empowers us to contribute to work and society, exercise and develop our talents, fulfill our civic responsibilities, and carry out traditions and values forward" (p. 12). Johnson et al. (2009) created a list of attributes today's employers seek in potential employees. This list includes critical thinking, problem-solving, effective communication, creativity, contextual learning, leadership skills, ethics, adaptability, and social responsibility. Employers want employees who can think for themselves, ask appropriate questions, adapt to changing environments, and perform duties (Schlesinger, 2009). Yet, there is a disconnect between today's society's needs and classroom teaching practices. Teachers feel forced to focus instructional time on direct teaching and self-directed student time for practicing for the test. A constructivist idea of learning through discovery is essential in developing independent learners and leaders for this world (Abrahamson & Kapur, 2018; Bell, 2010; Heinrich et al., 2015; Wagner, 2014; Wurdinger, 2012).

The demand for administrator and teacher accountability has driven education reform toward high-stakes testing. The students' scores are a tangible and easily accessible method for gauging student learning. Since the outcomes of standardized tests are indicators of student success, teaching to the test will likely continue to prevail in the classroom for the time being (Au, 2016; Baird & Elliot, 2018; Croft et al., 2015; Verger & Parcerisa, 2017). However, direct content instruction to prepare for test-taking and constructivist learning are not mutually exclusive. There are times when teachers need to conduct explicit teaching, and students practice that skill; other times, teachers must allow students to be self-learners.

Bakker (2018) warned against a sublation of teaching strategies where one method eliminates another. Many students lack the skills or background knowledge to perform all necessary tasks during a discovery learning lesson or unit. Guidance without background knowledge often fails to reach learning objectives (Roll et al., 2018). Most students need scaffolding of information and skills before performing constructivist learning tasks and have the desired learning outcomes. (Kirschner et al., 2016; Lazonder & Harmsen, 2016). Students must internalize information and apply what they have learned to discovery activities. The internalizing process may come from the repetition and practice of skills (Lazonder & Harmsen, 2016).

To ensure students succeed after their school experiences, educators must bridge the gap between rote learning in direct instruction and constructivist learning, such as discovery learning. Students need to transfer prior knowledge to new skills when problem-solving and thinking critically. State standards ensure the development of

necessary content skills while discovery learning instructional practices prepare students for the real world by strengthening conceptual learning and soft skills.

The Importance of Time Allotment

Covering a log of material to prepare students for high-stakes testing while giving students time-consuming opportunities to participate in constructivist learning leaves many teachers frustrated with planning efficient class time (McTighe & Brown, 2005). Bruner (1961) believed children learn based on schema or experiences, whereas Vygotsky (1975) believed children learn through social interactions. Both theories of learning require that students have time to experience learning and interact socially. During direct instruction, the teacher shares important information with students to ensure they get exposure to the correct method for using specific academic skills. Active learning is essential for students to be able to internalize information. Active learning is the time when the student becomes responsible for learning without direct instruction from a teacher (Andrews et al., 2011). Academic Learning Time (ALT) is when students actively learn. More ALT in the classroom is a good predictor of student success. Test scores increase when students engage in ALT (Fisher et al., 2015)

Constructivist type learning encompasses active learning in the classroom. Therefore, it is crucial to understand how much time a teacher needs to give direct instruction for learning skills and how much time allows students to be self-learners engaged in academic learning time. The best balance of time allotment for each instructional method will ensure students are prepared for state testing while meeting the

demands of the 21st Century. This research aims to find the best integration method for each pedagogical approach.

The Role of Administrators in Developing Time to Meet the Demands of High-Stakes Testing and 21st Century Learning

Creating learning environments that embrace accountability and prepare students for 21st Century skills must start with knowledgeable and supportive leadership. Partnership for 21st Century Skills (2009) called for school leaders to create professional learning communities (PLCs) when creating environments to best prepare students for the future. The Partnership urged educators to teach by example by demonstrating cooperative learning, time management, goal setting, monitoring results, and team building (Dufour & Dufour, 2010). PLCs enable educators to share best practices for embracing 21st-Century skills in the classroom and curricula.

Guiding Principles

Guiding principles have emerged as educational systems have moved to cultivate 21st Century schools and curricula. Standard-focused areas for success are vision, coordination, official policy, leadership, learning technology, and teacher learning (Trilling & Fadel, 2009). Federal and state legislators have already created a vision for changing educational practices to meet the demands of the 21st Century by enacting laws, changing standards, and requiring stricter accountability for educators. Sharing a common vision among government officials, educational leaders, business owners, parents, and students is essential when bringing the 21st-century demands into the

classroom. In addition, building-level administrators must share the same vision for their teachers and students.

Vision. Trilling & Fadel (2009) said leaders must ask and answer four questions when developing a vision. The first is to ask what the world will be like in twenty years. Once Leaders agree upon an idea of the future, then leaders need to address what skills students will need to have to be successful in that world.. Specifically, administrators should focus on teaching practices and learning, digital literacy and communication, and career and life skills when planning educational practices for the future. Thirdly, administrators should assess current techniques used and working in high-performing schools. Finally, school leaders should critically evaluate what schools and classrooms need to look like for 21st Century students versus what schools do daily. While critiquing school systems, the leaders should continually make plans for change, evaluate current efforts, and adjust to evolving conditions that offer the best educational experiences.

Implementation. Once administrators have a vision, they must coordinate to implement the actions needed for change. For example, P21 encourages principals to develop professional learning communities (2009). Principals can create PLCs through professional development, shared teacher planning, and developing school leaders.

Using the PLC model, administrators can ensure what Marzano (2003) described as a guaranteed and viable curriculum. Marzano stated that the curriculum should maintain a clear learning path across all disciplines. Professional learning communities within a school will ensure that all educators share a common understanding of

pedagogical practices best for teaching 21st Century skills. In addition, it will increase knowledge and use of technology to communicate through teachers sharing personal experiences and developing common assessments and units. McTighe and Sief (2010) stated:

> Without an orchestrated design, incorporating designated skills, processes, and habits of mind will be predictably haphazard and unlikely to produce the desired results. In other words, well-intentioned teachers working behind closed doors won't be able to guarantee a coherent curriculum of 21st-century learning. (p.152)

Administrators must build capacity within the school to ensure the transition from a teacher-centered classroom to a student-centered classroom necessary to create the 21st-century learning environment. Classroom teachers working toward common goals will assist in a more efficient and productive means to succeed.

Theoretical Framework

I used several learning theories working in unison to create the best learning environment for students. The first theory is the behaviorist theory of learning (Skinner 1974). Skinner's theory supports direct instruction for learning. Next is Brunner's (1961) theory of constructivist learning or discovery learning. He believed that knowledge comes from experiences. Finally, Vygotsky's (1978) theory of cognition and zone of proximal development explains learning from what a person can do on their own to

learning new skills with the help of a more experienced person. Both Brunner's and Vygotsky's theories support constructivist learning.

Behaviorist Theory of Learning

Behaviorists believe that "only observable, measurable, outward behavior is worthy of scientific inquiry" (Bush, 2006, p. 14). Skinner (1974) believed that behavior is controlled and predictable. He believed that the brain, thoughts, and intentions had no bearing on conduct. Finally, he believed that outside stimuli control behavior.

Skinner (1974) melded behaviorism and education by introducing his teaching machine. The machine, in the form of a book, used rote memorization and practice to ensure an outcome or learning. Likewise, modern computer-based educational software uses the rote and drill learning method (Weegar & Pacis, 2012).

Because behaviorists believe that learning comes from outside stimuli, instruction using this learning theory focuses on teacher direction, drill, and practice (Weegar &Pacis, 2012). The focus and predicted outcome are for students to learn the material. High-stakes tests evaluate mastery of skills defined by state standards.

Bruner's Theory of Discovery Learning

Bruner's (1961) discovery learning theory is one of two theoretical frameworks I used to design this research study. The approach has its origins in Piaget's cognitive development theory. Piaget (1976) believed that mental growth develops in age-dependent stages and begins at birth. However, Bruner believed that cognitive development is not age-dependent but depends on one's schema. He stated that no matter

people's age, they will use prior experiences to create meaning from newly gained knowledge.

Bruner (1961) defined discovery learning as a constructivist learning theory where students solve problems by drawing on previous experiences while using existing knowledge to acquire new understanding. Bruner (1977) said that learning follows a path of thinking through actions, images, and language. He stated that without working through this process, a student might have a firm grasp of the content's language but no idea how to use it. In contrast, a student may understand the subject and how it works in context with the world but not have the language to explain the knowledge. Therefore, mastery of a subject's background knowledge is essential for effective, intuitive discovery learning processes. Bruner said:

> In order for a person to be able to recognize the applicability or inapplicability of an idea to a new situation and to broaden his learning thereby, he must have clearly in mind the general nature of the phenomenon with which he is dealing. (p. 18)

Bruner (1977) stated that learning and knowledge transfer heavily depend on curricula or subject structure. Structure refers to the basic understanding of a subject as it builds to more complex forms or ideas. He developed the concept of scaffolding content instruction before and during discovery learning lessons to ensure mastery of content skills. According to Bruner, "[Scaffolding] refers to the steps taken to reduce the degrees

of freedom in carrying out some task so that the child can concentrate on the difficult skill she is in the process of acquiring" (p. 19). Scaffolding intends to simplify the task by building prior knowledge, motivating the child to discover new knowledge, highlighting essential facts and skills needed to acquire new knowledge, and modeling using previous experience to access new knowledge. Educators use scaffolding when teaching specific skills specified in state standards. Students build on this learning through the freedom to explore, fail, and try again to produce a final product from the discovery process (Wurdinger, 2012).

Bruner (1971) revisited the educational reform from the early '60s of moving toward discovery learning and added that the reform's original idea rested on the premise that all students want to learn. He said that students need the motivation to learn. Studies have shown that instructional practices associated with a strict procedural method of drills, memorization, and testing reduce student engagement in learning (Anderson, 2012). Wurdinger (2012) said students receive motivation in their extracurricular classes and sports because they experience hands-on activities, work with peers, and see progress in their ability level. These aspects of school, away from constant academic learning, tend to motivate the students. Bruner (1971) believed discovery learning increases student motivation and engagement, improving cognitive development. He said that students must desire to learn and believes that discovery creates excitement and self-confidence in one's ability.

Vygotsky's Theory of Cognitive Development

Vygotsky's theory of cognitive development (1978) is another theoretical framework I used to design this study to explain how students construct knowledge. Vygotsky's theoretical construct of the zone of proximal development (ZPD) defines knowledge acquisition as a level of cognitive growth starting with what children can do on their own versus what they can do with the help of a more knowledgeable person. He believed that as children learn from a teacher or more knowledgeable peers, they will move on the spectrum of ZPD from needing guidance to mastery of any skill.

Vygotsky's theory of cognitive development stresses the importance of socialization and authentic experiences. Parallels between Vygotsky's theory and constructivism construe knowledge as a developmental process through experience and social interactions (Doolittle, 1995; Jaramillo, 1996). Learning environments and teacher pedagogical practices in a constructivist classroom utilize group work, discovery learning, and problem-solving. Socialization and discovery are essential dynamics within student-centered classrooms. The Partnership for 21st Century Skills (2008) requirement necessitates educators to provide authentic experiences. Vygotsky (1978) believed learning occurs best when the lessons embed authentic experience. Therefore, P21 emphasizes the need for classroom lessons to provide real-world experiences so that students can understand the need for the skill.

In addition to Bruner's theory of discovery learning and Vygotsky's ZPD, other researchers have added to the constructivist instructional paradigm's understanding.

Kapur (2008) stated that students must struggle with concepts to understand problem-solving assignments better. Using prior knowledge to generate answers, even if a solution is incorrect, forces students to notice aspects of the problem that will become clearer as the teacher gives subsequent instruction. In other words, he believed that a productive struggle provides students with opportunities to prepare and learn for future education. Chase and Abrahamson (2015, 2018) add the concept of situated intermediary learning objectives (SILOs) when studying the aspects of discovery learning. SILOs are cognitive challenges within an activity designed to force students to learn by discovering the process's steps.

Direct Instruction (DI)

As a pedagogical approach, direct instruction maintains that all students can learn if the instruction is faultless and unambiguous. All students can learn new material with prerequisite skills mastered (Engelmann & Carnine, 1991). DI is different from constructivist learning in that it implies that learning is best when the instructor provides carefully chosen examples and concise steps in learning. DI focuses on mastering learning to avoid correcting false conceptions (Stockard et al., 2018).

Direct Instruction (DI) and Constructivism

Theories of direct instruction and constructivism help explain direct standards-based instruction and discovery learning discussed in this review. Direct instruction focuses on teacher-led instruction to ensure correct learning and mastery of content (Rosenshine, 2008; Stockard et al., 2018). Constructivists believe that one makes their

understanding of the world through past experiences (Elliot, 2000; Fox, 2001; Phillips, 1995). Although direct instruction and constructivism are similar, advocates of DI believe knowledge comes through experiences, and they assert that teachers need to control experiences and learning. In contrast, constructivism focuses on students' discovery and making meaning of their learning.

In contrast, constructionists think knowledge comes through personal interpretations (Ertmer & Newby, 2013). Direct Instruction epistemology holds that truth is universal and constant. Constructivist epistemology states that experience is ever-changing. Therefore, validity relies on a person's understanding of the world (Kidron, 2015).

A state's academic standards define what students should learn during each grade level of instruction. Students must learn, store, and use the standards' skills while taking the state test to prove academic growth. Multiple-choice questions dominate state exams. This format does not allow for interpretation but instead gives one correct answer. Technical considerations and ease of administration drive state assessments' design rather than assessing all learning practices (Baird et al., 2017). Therefore, constructivist learning is not present in most state assessment tools. Multi-choice questions do not lend themselves to alternate ways of thinking. Instead, teachers must drill the correct answer through memorization and practice. This practice of drill, practice, and teacher-led instruction encompasses the principles of Direct Instruction Theory.

The definition of setting is a constant truth, and a student can use rote memorization to recall it for an assessment question. However, when an assessment question asks how the setting affects the plot, the depth of knowledge (DOK) is deeper using analysis. It is the time and place the event occurs. To ensure a consistent understanding of a setting, the teacher will often explain or describe it. Repetitive practice teaches the procedure of analyzing the relationship between the setting and the plot; therefore, the analysis process is not authentic to the student's understanding of how to interpret the relationship. Instead, the students may regurgitate what the teacher has ingrained in their knowledge of the setting. Instructors often lead a class discussion on how a setting adds to the story's plot, and then students practice the skill by taking teacher-developed tests. By the end of the year, students have practiced answering the analysis of setting types of questions enough to succeed on the test. Allowing a student to self-define the setting and its relation to the plot would not guarantee success on the exam. Practicing the vocabulary used to define the literary term and memorizing the elements associated with settings and plot will ensure success on the test but not mastery of 21st Century skills of critical thinking, collaboration, and communication.

Math standards are also absolute truths, meaning only one correct answer exists for math problems. Solutions are not interpretations. Most state assessments do not assess a student's process for answering the question (Baird et al., 2017). On a multiple-choice test, the answer is correct or not correct. The answer is not up for interpretation; therefore, math teachers must require the prescribed solutions to reflect the test's correctness. In the classroom, math teachers want to see students' work to understand

their process for solving math problems. However, the teacher knows that discovering an answer will not guarantee success while taking most state assessments. With this reality, math teachers feel bound to a procedural approach to teaching to the test to ensure mastery of skills before testing (Guinn et al., 2016).

Discovery learning uses constructivist tenets by allowing students to make sense of the question, collaborative work, or project through self-discovery and meaning. Seven pedagogical perspectives align a constructivist learning environment: students gain experience in the construction process of knowledge; students learn to appreciate multiple perspectives; learning is present in a real-world context; ownership of learning occurs; students gain a social experience in education; students use various modes of presenting work, and students gain self-awareness of the acquisition of knowledge (Honebein,1996; Knuth & Cunningham, 1993). Framing the same ELA standard with a constructivist teaching method would enable students to articulate their understanding of the setting based on individual experiences. The students would find stories where the setting directly affects the plot and then analyze its relationship with its development. Scaffolding would occur as the teacher explains the definition of the literary term. Depending on the student's ability level, the teacher may also need to guide discovery learning by giving preselected stories or novels to study. For math skills, the teacher may provide students with a new math problem and ask them to use prior knowledge of math skills to develop a plan to solve the problem.

Conclusion

Because the constructivist teaching style can be time-consuming, teachers often feel they must abandon it to focus on preparing students to take the state test (Anderson, 2012; Moon et al., 2002). Both direct content instruction and constructivist learning are essential for preparing students to succeed in high-stakes testing and the changing demands of today's careers. High-stakes test scores as a measurement for student academic growth define successful teachers. Included in the study are the pedagogical practices used in direct content instruction and constructivist learning in the study to evaluate how successful teachers proportion their instructional time between the two. While ensuring success on the state exam, educators must also allow students to grow as innovators, collaborators, and leaders (Wurdinger, 2012). Rose (2015) suggested that teachers allot 50% of instructional time to each pedagogical practice. However, teachers have time restraints from schedules and other disruptions from school activities that limit their ability to accomplish this goal. In this study, I delved into actual classroom settings to explore the realities teachers face with the seeming tug-of-war between preparing for the tests and real-world learning.

CHAPTER THREE

METHODOLOGY

Over the last decade, school reform has resulted in a dichotomy of required teaching strategies to meet objectives designed to increase student learning while preparing students for 21st Century skills in the workforce. For example, teachers must use direct standards-based instruction to improve test scores for educator evaluation. On the other hand, the Profile of the 21st Century Graduate requires teaching and practicing soft skills in constructivist-type activities such as discovery learning. Classroom teachers are left to solve the problem of meeting both demands is left up to classroom teachers in determining time management for each pedagogical practice.

Purpose

In this study, I aimed to answer the research questions related to how successful teachers meet the demands of high-stakes testing while providing opportunities for students to participate in constructivist learning activities. In the district where the study occurred, teacher success is by having 60% of students raise their MAP scores by six points and SCReady scores by 10 points. Through surveys, open-ended questions, and follow-up interviews, I assessed teachers with consistently high student growth reported on SCReady and MAP to find an optimal allotment of time between direct standards-based teaching and discovery learning activities (See Appendix A and B). Next, I explored teaching strategies used by successful teachers to create constructivist learning environments. Finally, I explored best practices among administrators that support 21st Century teaching.

Research Questions

1. How do select classroom teachers allocate instructional time between direct standards-based instruction and constructivist teaching practices while maintaining adequate student growth as measured by SCReady and MAP?
2. What types of pedagogical practices are teachers using to meet the demands of the Profile of the S.C. Graduate?
3. What are school-level administrators doing to help classroom teachers provide opportunities for constructivist learning practices?

Delimitations

This study has two delimitations. The first delimitation is that I only used math and ELA teachers in the study because the participating district only assesses these subjects using SCReady and MAP. Finally, I limited participants to middle school teachers because students at this level of education are developmentally ready to learn 21st Century skills (Kay, 2009). SCReady and MAP to assess student growth end at the participating district's ninth-grade level.

Methodology

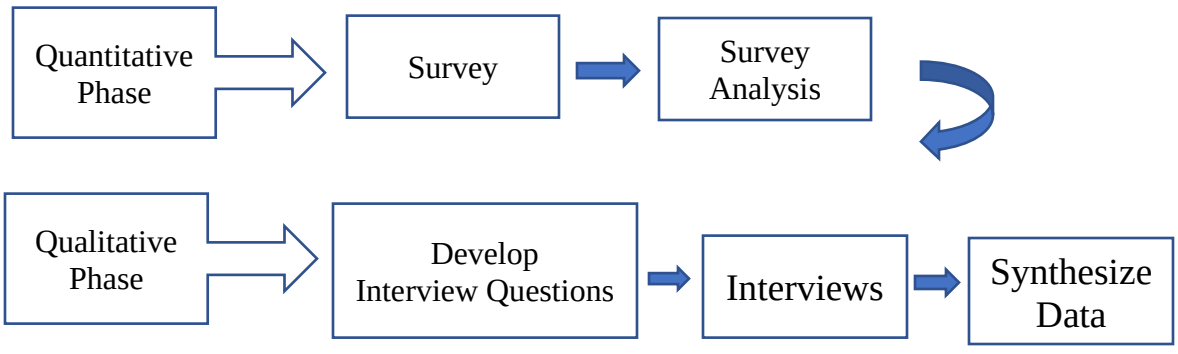
In this study, I used an explanatory sequential mixed method design to gather data for the research. This method was best for the study because I used quantitative data to analyze instructional time allotments, while I used interviews to collect further

information concerning reasons for the time allotments (Creswell & Plano, 2018). The study's paradigm framework started with a postpositivist perspective in that I created a survey using my knowledge of direct standards-based instruction and discovery learning activities. First, I collected data for specific classroom time spent on each pedagogical style, and then I developed a list of discovery learning activities and tools successful teachers use for instruction. Finally, I collected information to determine administrators' best practices supporting constructivist learning environments.

The qualitative phase of the research switched to a constructionist perspective by giving specific teachers a chance to explain their classroom instructional designs. (Creswell & Plano, 2018). After evaluating the survey results, I interviewed specific teachers to further explore and explain the allotment of time in the classroom for each teaching style. The interview questions assisted in clarifying answers to the survey while giving further information on teaching practices. It will also allow the participating teachers to explain further how their building-level administrators support their classroom practices. Figure 1 shows the flow of my explanatory sequential mixed method design.

Figure 1

Study Flow chart



Research Methods

The study took place in a district where all middle-level students receive MAP and state assessments. This district was ideal for this study because it provided enough population size. In addition, the school district was unique from some school districts in South Carolina in that others do not give the MAP assessment to all middle-level students.

In this study I aimed to assist in the understanding of how classroom teachers meet high-stakes testing demands while incorporating opportunities for developing 21st Century skills. Participants came from both teachers with students' showing adequate academic growth on state assessments and from those who did not have at least 60% of total students taught showing adequate academic growth. Having all teachers participate helped gain a better understand how different structured classes affect learning. I had planned to use a minimum of 40 participants in the study; however, only 11 teachers participated.

After obtaining permission from the district superintendent, I sent a link to the study's survey and a letter of invitation to all ELA and math teachers in the district. The letter explained the purpose of the research. The study included ELA and math teachers because they are the only subject areas tested using the MAP assessment tool. The letter also explained how best to estimate time allotment for each type of instruction.

I collected all data using Qualtrics (See Appendix A). The survey included some questions from the West Virginia 21st Century Teaching and Learning Survey developed

by Ravitz (2014). This survey is publicly available for studies in teaching 21st Century skills. It is reliable (std. alpha > .90, inter-item correlations > .58). I used Ravitz's survey to write questions 5 through 10 for this study. I changed the response questions to fit the purpose of this study. I did not use the questions on the Ravitz survey concerning teachers' perceptions of their ability to develop a 21st Century learning environment in this study since it assessed actual practices and not perceptions of using constructivist lessons. Instead, I added questions assessing direct instruction and the administrator's role in developing 21st-century learning environments to address the research questions for this study. Short answer responses allowed participants to explain their answers while assisting me in developing interview questions (See Appendix A). To increase the significance of each question, the sample size for both tests was to be 40 participants. (Dahlbeck & Lightsey, 2008; Huck, 2012). Since only 11 teachers participated in the study, instead of using a Chi Square analysis, I used crosstabulation in SPSS for each variable and category of those variables on the survey. The variables were: Response, representing each responder to the survey; Subject, ELA, or Math; Level, Regular Ed./Inclusion, Advanced, or Gifted and Talented; Academic Growth, Met or Not Met; Time for Constructivist Instruction, and Time for Direct Instruction

Research Question 1 – Time Allotment. To answer this question, I used the analysis data labeled Response, Subject, Level, Academic Growth, Constructivist, and Direct Instruction to find which classroom time allotment between student-led and direct instruction minutes produce successful academic growth on high-stakes tests. In addition, I analyzed data to see if the student's and subject's findings changed from the overall

analysis between types of instruction to meeting academic growth. Measurement of success is that 60% or higher of total students taught meeting target growth

In the survey, I asked the teacher to enter the time spent per week on constructivist or student-led lessons and time spent on direct instruction. Because teaching strategies may not take an entire class period, the participants answered each prompt by estimating the best value for the allotted time given to each method per week. I then was able to calculate the average time spent on constructivist lessons and direct instruction from the teacher by dividing the total week's minutes by 5, which is the number of school days. Every class may not use all the strategies of constructivism. Therefore, I assessed the average time spent on the two categories to address the first research question.

Research Question 2 – Types of Constructivist Lessons. To answer this question, I used the analysis data labeled Collaboration, Presentation, Create, Critical Thinking, Global Awareness, Community Awareness, and Technology Integration. I also wrote a narrative concerning the answers to the open-ended questions about the types of constructivist learning used by the participants.

Research Question 3 – Principal's Participating. To answer this question, I used analysis data labeled Time for PLCs, Shared Planning, Department Meetings, and 21st Century Training to analyze minutes given to teachers by the principal for creating a 21st Century learning environment. I also wrote a narrative about the responses to open-ended questions relating to how principals are helping teachers.

Survey Organization

Survey questions 1 – 3 collected demographic information from each participant. Questions 4 – 10 asked about the time spent on 21st-century skills. Questions 11 – 14 asked about students' direct standards of instruction and practice, and Question 14 asked about the frequency of giving specific assessment types. Question 15 asked about using types of constructivist lessons. Question 16 was an open-ended response allowing participants to list other strategies to incorporate a discovery learning environment. Question 17 asked about administrative support for establishing a 21st Century learning environment. Finally, Question 18, was an open-ended question to allow participants to discuss other ways their principal assists them in establishing teaching practices that meet the demands of high-stakes testing and 21st Century Skills. Chapter 4 includes a discussion of successful strategies teachers use. Table 1 shows definitions and classroom uses for types of constructivist learning associated with this study. Table 2 shows definitions and classroom uses for types of direct instruction associated with this study.

Table 1

Explanation of Constructivist Learning

Constructivist Learning		
Subcategories with Definitions Partnership for the 21st Century Skills. (2009). *21st Century support systems.* https://static.battelleforkids.org/documents/p21/P21_Framework_Definitions_New_Logo_2015_9pgs.pdf	**Characteristics**	**Related Interview questions**
Collaboration: Assume shared responsibility for collaborative work, and value the individual contributions made by each team member	Small Group Work Joint Projects	Please explain how often you use group-work and purposes for uses it.

	Group Presentation Peer Feedback	
Presentation: Articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts	Structure Data Oral Presentations Videos, Blogs, etc.	Please explain how you use student presentations in your class.
Create: Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas	Brainstorm Original Ideas Invent a Solution Create Product	Please explain how your students create their own projects to demonstrate learning.
Critical Thinking: Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts	Choose Topic Plan Steps Evaluate Source Use Feedback	Do you allow students to pick their own research project? Explain your activities for students to use feedback to revise work.
Global Awareness: Understanding other nations and cultures, including the use of non-English languages	Study and Use Ideas from Other Countries Understand Other Cultures	You said that you used articles/books to study other cultures. Please explain the activities associated with the lessons.
Community Awareness: Understanding the local and global implications of civic decisions	Investigate Local Issues Apply Learning to Local Situations Plan Solutions for Local Problems	Explain how you use the local newspaper to assist in community lessons. You said you do not address community awareness. Can you explain why?

Technology Integration: Use technology as a tool to research, organize, evaluate, and communicate information	Self-instruction Online Resources Share Information Team Work Organize Assignments	Explain how students use technology in your room. You did not count online programs for math/ELA as independent work. Please explain your reason for this.

Table 2

Explanation of Direct Instruction

Direct Instruction		
Subcategories with Definitions Rosenshine, B. (2008). Five meanings of direct instruction. Center on Innovation & Improvement, Lincoln, 1-10.	**Characteristics**	**Related Interview questions**
Direct Instruction with Paper Practice: The teacher lectures and demonstrates the skill with immediate student practice on paper with immediate feedback.	Worksheets Blank Paper Journals Written Reports	Please explain your decision to give 15 minutes for direct.
Direct Instruction Followed by Teacher Assigned Computer Practice: The teacher lectures then assign a computer program for students to practice the skill.	IXL No Red Ink Flocabulary Mathia GoogleDoc	Explain how the computer programs you use enhance your direct instruction.
Direct Instruction Followed by State Test Practice: The teacher lectures and demonstrates testing strategies followed by student practice and immediate feedback.	Text Dependent Analysis (TDA) Multiple Choice Strategies	Explain how you prepare students for high-stakes testing.

	Evaluating Prompts Essay Writing Use of Released Test Questions	

Interviews

Interviews helped to clarify data from the survey. An interview aims not to get answers to questions but rather to understand the experiences (Seidman, 2013). The interview questions followed three protocols: interview questions align with the research questions, interview questions construct an inquiry-based conversation through open-ended questioning, and the interviewee approves interview response transcripts. I used member checking to assure interpretations of the data written as a narrative were accurate and trustworthy (Creswell & Plano Clark, 2018). Member checking is the process where the interviewee approves the interpretation of qualitative data.

I gave an option on the survey for teachers to provide their names. For anonymity, giving a name is optional; however, the invitation letter to participate had a statement concerning the need to interview teachers to clarify their classroom practice. Therefore, I interviewed those teachers whose responses needed further clarification. All participants were from the same district, so that I had access to email accounts through school directories. See Appendix B for the teacher interview protocol.

I contacted potential interview candidates based on their responses to the survey questions. The interview questions helped clarify classroom practices of time allotments

for constructivist lessons, activities, and methods of administrator's assistance in developing 21st-century learning environments. An example of a clarifying interview question was if a teacher reports using Problem-Based Learning twice a month. Problem-Based Learning (PBL) takes considerable time (Baker et al., 2008); therefore, it was essential to understand if the teacher understood PBL. The interview question helped to understand how the teacher designs PBL to include two quick activities. Another example needing clarification was when a teacher reported that her administrator provided Professional Learning Communities (PLC) for developing constructivist learning lessons. I wanted to glean further information concerning the design the PLC, how often they meet, and the output from the meetings.

I contacted potential interview participants via email to see when and how the best time to meet was. I provided options for a Zoom meeting or phone call. At an agreed-upon time, I contacted the interviewee for a session lasting no longer than 30 minutes. Thirty minutes did not take up an entire planning period for the teacher. I recorded the meeting so that I could transcribe it later.

After the interviewee approved the transcripts, I analyzed all responses by looking for common themes for developing and applying constructivist lessons. The analysis followed Renner & Powell's (2003) guidelines. First, I read the data, then created questions I wished to answer based on the purpose of the study. Then, I noted emergent themes and categories across all responses. Finally, after analyzing the connections between categories, I wrote an interpretative narrative to present the findings. Since the population asked only for names willing to interview, to just those giving their names, I

was only able to interview five teachers; therefore, I did not use a computer-based program for analyzing qualitative data.

Limitations

The study will have some limitations. The sample of teachers in this study was from one rural district. For this study, I only invited middle school math and ELA teachers to participate. Although I mailed over 50 invitations to participate in the survey to teachers, only 11 participated. The limited participation skewed the results; however, I was able to show a trend successful teachers used in classes meeting the requirements for academic growth.

Positionality

I am a former middle school English Language Arts teacher. I have conducted informal research on my teaching practices to see how varying practices affect student scores. On the years I used several cross-curricular activities and STEAM lessons, too many students' test scores did not meet adequate growth. It took me two years of adjusting my classroom practices to find the best use of my class time while ensuring students were learning the skills built into each lesson. I found that when I divided my class time equally between direct instruction with individual practice and constructivist activities most students I taught met the required growth on state testing. I had to constantly revisit the skill with practice during STEAM lessons. In my teaching, repetition and individual practice shared equally with student led learning produced the best learning environment.

I believe educators should not focus solely on test scores because that produces a one-sided learning environment. Today's careers require educators to equip students with the skills necessary to succeed in the technology-based global market. However, during my 22 years of teaching, I have seen when too much emphasis is on constructivist learning, students fail to master required skills to form a strong base for building further complex thinking.

On all my evaluation using classroom observations, I have feedback concerning the total minutes I used for direction instruction. Either I received praise for using no more that 15 minutes, or I received demerits for using too much time for direction instruction. The teacher observation tool used by both districts I worked in has a section for the administrator to note if direct instruction is under 15 minutes. I am concerned that the push for teachers to be facilitators of learning while students led their own discovery of learning overshadows the needs of students. I believe educational reform should not replace strategies that work while improving teaching practices to keep up with our changing world.

I will not use my scores in the data collection process for this study. I will also not allow my experiences and beliefs to skew the interpretation of data. I wish to strengthen a non-bias, generalizable study. I used member checking to increase the trustworthiness of the open-ended and interview responses (Creswell & Plano Clark, 2018; Giddings & Grant, 2009). I gave the participants a copy of their transcript for the open-ended and interview responses with my interpretations. I added the information to the study's findings upon approval of the transcripts.

Closing

I aimed to find the optimal division of classroom time spent on direct standards instruction with practice and constructivist learning activities to meet both demands of high-stakes testing and 21st Century skills. The study's findings can help administrators design schedules, curricula, and professional development opportunities that ensure the best learning environments for today's students. Using a mixed-methods design for gathering data developed a clearer understanding of what goes on inside a classroom by giving a voice to the teacher. Open-ended questions on the survey and interviews allowed teachers to explain their current teaching practices that lead to successful student academic growth. Teachers also shared what administrators need to develop and maintain a 21st Century classroom. This information can help educational leaders plan productive PLCs and professional development.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF FINDINGS

Introduction

This section analyzes and discusses findings from a survey given to 52 middle-level math and ELA teachers in the participating school district. Through the study, I aimed to understand the best use of class time between constructivist learning and direct instruction. In addition, I wanted to find the best practices when using constructivist strategies and for building-level administrators in assisting teachers in preparing a 21st-century learning environment. Analyzes and discussions will follow the order of the research questions.

1. How do select classroom teachers allocate instructional time between direct standards-based instruction and constructivist teaching practices while maintaining adequate student growth as measured by SCReady and MAP?
2. What types of pedagogical practices are teachers using to meet the demands of the Profile of the S.C. Graduate?
3. What are school-level administrators doing to help classroom teachers provide opportunities for constructivist learning practices?

Chapter Organization

I organized the chapter into three sections. In the first section, I present the

analysis of data gathered for class time spent on constructivist learning and direct instruction. I then discussed the findings of the survey. This section also includes a narrative explaining interview responses for time allotment. Finally, I ended by discussing how the responses helped explain and clarify survey responses.

For the next section, I present the analysis of data relating to the types of constructivist learning each participant used for instruction. A discussion follows the survey analysis. Then, I discussed the responses to interview questions regarding the types of constructivist lessons used by the participants and how the responses helped to clarify survey responses.

I ended the chapter by presenting data on how principals in each participant's school help develop 21st Century learning environments. A discussion of the minutes allotted for each type of principal assistance follows. Finally, I end this section with a discussion of the interview responses used to explain the survey responses further.

Allotment of Time Analysis

This section addresses the first research question of how much time teachers give to constructivist learning and how much time to direct instruction. Although I sent out 52 invitations to participate in the study to ELA and math teachers across the participating district, only 11 responded to the survey. Because the statistical analysis is not robust with only 11 participants, I only analyzed the relationships between variables and categories of those variables on the survey using crosstabulation in SPSS. The variables are response, subject, level, growth, constructivist, and direct Instruction. The categories

under Subject are ELA and math; under Level are Regular/Inclusion, Advanced, and Gifted and Talented. The categories under growth are met and not met. Measurements for time for constructivist learning and direct instruction are in minutes per class. The amount of class time are 75, 70, 65, 50, 40, and 30 minutes for constructivist learning, and 30, 25. 20. 15, and 10 minutes for direct instruction.

I first analyzed the relationship between response (participant's answers) and growth to see which survey responders reported successfully meeting targeted academic growth on state tests over four years. As discussed in Chapter 2, success is having 60% of students taught meeting targeted growth. Therefore, the category met in the analysis means the teacher had 60% of the students taught to meet their targeted growth in at least three out of the four years. Table 3 shows which survey participants had 60% or higher of their total students taught met targeted academic growth.

Table 3

Meeting and Not Meeting Academic Growth

Academic Growth		
Survey Responses	**Met**	**Not Met**
1	X	
2		X
3		X
4		X
5		X
6		X
7	X	
8	X	
9	X	
10	X	
11		X
Total	5	6

Responses 1, 7, 8, 9, and 10 met the requirements for success on the high-stakes test. Responses 2, 3, 4, 5, 6, and 7 reported that the students did not meet targeted growth. The Measure of Academic Progress (MAP) assessment tool is the assessment tool to measure student growth (nwea.org). As discussed in Chapter 2, MAP data correlates positively to the state's SCREADY assessment. Therefore, if a student is successful on the MAP assessment, the student stands a high chance of success on SCREADY. I used the data showing which responses met growth targets and which did not meet when analyzing the remainder of the variables and categories within those variables.

Next, I analyzed each responder's level of education taught to see the academic level of those who met targeted growth and those who did not. Table 4 shows the distribution of time allotment by educational level.

Table 4
Academic Level Taught

Academic Growth			
Survey Responses	**Regular/Inclusion**	**Advance**	**Gifted and Talented**
1			X
2	X		
3	X		
4	X		
5	X		
6	X		
7	X		
8	X		
9		X	
10			X
11	X		
Total	8	1	2

It is essential to know which level each successful class is to determine if the best allotment of time between constructivist learning and direct instruction varies among the academic levels of classes. Using the first chart, I found that responders one and ten met academic growth. The second chart shows that both teach a GT class. I used this process throughout the analysis process. The two GT and Advanced courses met the required target for academic growth. All but one Regular/Inclusion class did not meet targeted academic growth.

To analyze teachers' time on constructivist learning and direct instruction, I ran a crosstabulation analysis on the variables growth, and constructivist, then on growth and direct learning data. Time is in minutes, and each amount came from the survey responses. Finally, I created an average time spent for all constructivist-type lessons and an average time spent on direct instruction by the teacher per class.

When teachers use 65 to 80 minutes or 72% to 89% of class time on constructivist learning, Advanced and Gifted Talented students meet their academic growth target on the MAP assessment. However, only one Regular/Inclusion class was successful when the teacher used 80 minutes for constructivist learning and 10 minutes for direct instruction. I was unable to interview this teacher to gain information on her successful teaching practices when giving the majority of class time to constructivist learning. Also, one Regular/Inclusion class was successful, with 45 minutes of constructivist learning and 45 minutes using direct learning. I was able to interview this teacher and found that she felt she had to spend half of her class time using direct instruction with practice so that her students would learn the math skills correctly. When most teachers use 70 to 80

minutes or 78% to 89% of class time using constructivist-type lessons, leaving 10 to 20 minutes for direct instruction, the students in Regular/Inclusion classes fail to meet their academic growth target. Table 5 shows time allotments between constructivist learning and direct learning synthesized with the level of education taught.

Table 5

Academic Growth and Time Distribution

Distribution of Class Time Between Constructivist Learning and Direct Instruction										
Met Targeted Academic Growth										
Constructivist Learning						Direct Instruction				
Minutes	80	75	70	65	45	45	25	20	15	10
Regular/Inclusion	1				1	1				1
Advance				1			1			
Gifted and Talented	1	1							1	1
Did Not Met Targeted Academic Growth										
Constructivist Learning						Direct Instruction				
Minutes	80	75	70	65	45	45	25	20	15	10
Regular/Inclusion	1	3	2					2	3	1

I wanted to see if these results were consistent when comparing minutes spent on each instruction type to the subject taught. When the ELA teacher uses 70 to 80 minutes or 78% to 88% of class time on constructivist learning, an adequate number of regular education students did not meet targeted growth. The only successful teachers meeting targeted academic growth in ELA were GT and advanced classes. The teachers in these classes used most of the class time spent on constructivist or student-led lessons. Only three participants were math teachers. Again, the successful Gifted and Talented (GT) teacher spent 80 minutes on constructivist learning and only 10 minutes on direct instruction. The regular education teacher who met targeted academic success divided her time evenly, using 45 minutes for constructive learning and 45 minutes for direct instruction.

Discussion

Eleven out of the 52 surveys sent to ELA and math teachers responded. Because of the small participating population, the results are not generalizable until further research with larger population size. Despite not having a robust study, a trend appeared in time allotment for constructivist learning and direct instruction while meeting high-stakes testing requirements. The academic level of the class creates the most impact when planning instruction.

For each data analysis set, Advance and Gifted and Talented students were successful with less direct instruction and more time for constructivist or student-led learning. Their success is not surprising since these students typically possess a drive to learn with a higher active working memory ability than students at a lower academic ability level (Rodríguez et al., 2019 & Van Sickle et al., 2019). The data analysis shows that a teacher of higher academic ability level students can spend only 10 to 15 minutes of direct instruction on skills before letting the students take control of their learning. Classroom teachers can quickly present a skill, and then the students can remember concepts and use those skills to internalize how to apply them without extensive direction from the teachers. (Engelmann, 2014; Morgan, Farkas, & Maczuga, 2015; Zhang, 2016),

The push for constructivism in teaching practices causes teachers to spend less time on explicit teaching. Constructivist learning and direct instruction share the need for students to internalize and use information. Explicit teaching by the classroom teacher ensures that the internalized information is correct (Roll et al., 2018; Stockard et al., 2018). Based on the trend unfolding in my limited research, concentrating on constructivist learning strategies for classroom instruction is failing students at lower levels of academic ability. The interviews I administered further explain this phenomenon.

Interviews Relating to Time Allotment

Interview responses are from volunteer participants. Referring to Table 1, Responders 1, 2, 5.7. and 11 agreed to an interview. Responder 1 is in her 10th year as an

8th-grade ELA teacher of Gifted and Talented students. Responder 2 is an ELA teacher who taught 8th-grade Honors classes for six years and 7th-grade regular education for the last four years. Responder 5 is a 6th-grade regular education ELA teacher working on her 22nd year of teaching. Responder 7 is in her 22 years of teaching. She taught 6th-grade math to regular education students and Gifted and Talented students before becoming an 8th-grade regular educator. Finally, Responder 11 is in her 25th year of teaching. She received her national board license in science and taught science and ELA for 15 years. Over the last ten years, she taught 6th-grade ELA for eight years and 7th-grade for the previous two years. All interviews were virtual using Zoom. Each interview lasted for 30 minutes.

Interview Questions

After years of not meeting the requirements for successful test scores, did you change your teaching strategies for class time allotments? All interviewees stated they did not change their class time devoted to constructivist learning and direct instruction. When I asked each to explain why they did not change, Responder 1, GT teacher, stated that she did not change because her students have met the requirement for academic growth over the reported years. However, she also said that after Covid, her percentage of students meeting targeted academic growth has declined.

Responders 2 and 5 stated that they had not changed the time allotment for each strategy because the district does not want teachers to spend more than 15 minutes on

direct instruction. They both explained that the district's focus is on student-led instruction. Teachers are to serve as facilitators.

Responder 7 stated that she had to change her time between direct instruction to an equal split of 45 minutes each. She did this because her classes have contained over 30 students for several years. Therefore, the room does not have enough space to place students in collaborative groups. She also talked about how the district wants teachers to spend no more than 15 minutes on direct instruction. She explained that it is easier to spend extra time teaching math skills the correct way instead of trying to correct the learning of students who taught themselves the wrong way to perform the skill. She said she spends half her class with explicit instruction for 45 minutes. Then, she allows them to practice independently while conferring with a peer for the remaining 45 minutes.

Responder 11 stated that she adjusts her strategies to align with the needs of each class and each year of new students. However, she does not change the time allotment since the district asks that direct instruction only be 15 minutes or less. She added that spending more time with student-led activities increases student engagement. Therefore, she spends 70 minutes on constructivist learning and 20 minutes on direct instruction.

Explain how you prepare students for high-stakes testing. All interviewees stated that during 3rd and 4th quarters of the school year, they spend more time using direct instruction to prepare students for the final MAP assessment and SCReady. The ELA teachers say that the district provides two essay assignments a year that have the same prompt for each grade level throughout the district. The teachers must spend time

explicitly instructing the students on the meaning of the prompt, using text-dependent responses and the state rubric for writing before the students write the essay. All interviewees stated that these districts mandated essays increase the amount of direct instruction during the class period. The mandated essays take three days during 1st semester and another three days during 2nd semester.

All interviewees stated that they use SCReady-type questions on their classroom assessments. In addition, teaching testing skills is part of their direct instruction throughout the school year.

Does one type of instruction, direct or student-led, prepare students for high-stakes testing? Why? I asked this question early in the interview, then revisited it after our discussion concerning technology. A discussion on using computer programs is in the section about how teachers use constructivist learning in their classes. At the beginning of the survey, all but Responder 7 said that constructivist and direct instruction prepare students for the test. Responders 1, 2, 5, and 11 said that student-led instruction creates ownership of learning, so students test better. Responder 1 teaches a GT class, so they are likelier to take ownership of learning. Her students did meet the requirements of academic growth. Responders 2, 5, and 11 did have the required number of students to meet academic growth and spent more time using constructivist learning activities. All three said that direct instruction is essential but should not spend most of the time in class. Responder 7 felt both contribute to success on the state tests; however, she stressed the need to spend adequate time using direct instruction to ensure correct skills learning.

All interviewees reported that during constructivist activities, they facilitate learning by walking around the room and giving further direct instruction to students who seem to be struggling. However, the respondents did not include one-on-one time with individual students or groups on the survey for direct instruction.

Discussion

Survey responses explained why most teachers participating in the survey reported using 20 minutes or less for direct instruction during class. The district's request for using 15 minutes or less for direct instruction aligns with the nation's educational reform to increase opportunities in the classroom for constructivist learning (Stockard, 2018; Wurdinger, 2012; Yager, 2000). All interviewees viewed direct instruction as the time they spent standing in front of the class while teaching the group. The extra time needed for individual students agrees with the research that direct instruction increases learning (Engelmann, 2014; Morgan, Farkas, & Maczuga, 2015; Roll et al., 2018; Stockard et al., 2018; Zhang, 2016).

Even with the facilitating provided by the teacher during constructivist learning, the data analysis of this study showed a trend that 10 to 15 minutes of a teacher giving direct instruction to the whole group is not enough to ensure success on high-stakes testing. An explanation may be that teachers do not have time to meet the needs of the entire class while working with individual students or small groups. Another could be that middle school students socialize more than learn during collaborative lessons.

Further research will help to determine why facilitated learning differs from direct instruction.

All participants stated that both constructivist and direct learning contributes to success on state tests. They believed that when students lead their learning, they take ownership of the education, increasing success. Although this is true, the interviewee did acknowledge that their decision to provide show times for explicit instruction is not producing successful scores on high-stakes tests. The teachers were reluctant to address how direct instruction may increase learning and ensure students meet targeted growth on state assessments. This reaction probably relates to the district's push for less explicit teaching.

Finally, questions relating to time allotments for preparing students for high-stakes tests revealed that class assessments align with questions on state tests and that more direct instruction is present. This practice is often called teaching to the test (Jenning & Bearak, 2014; Popham, 2008). Starting using more direct instruction the two to three months before the last MAP test for the year and SCREADY contradicts the idea of using most class time on constructivist learning. Increasing direct instruction for average and below-average academic ability level students throughout the year should produce more success on high-stakes testing than changing the class structure at the end of the year. This trend occurred when I analyzed successes individually among math and ELA classes.

All but one Regular/Inclusion class did not meet targeted academic growth when the teacher spent most of the class period on constructivism. The trend does align with research on the effectiveness of direct instruction. Results from a study by Stockard et al. (2018) found that students retain information better when teaching is explicit and presents unambiguous examples of skills.

Although additional examples of research support that direct instruction enhances learning (Engelmann, 2014; Morgan, Farkas, & Maczuga, 2015; Zhang, 2016), the push for constructivism in teaching practices causes teachers to spend less time explicitly teaching. Constructivist learning and direct instruction share the need for students to internalize and use information. Explicit teaching by the classroom teacher ensures that the internalized information is correct (Roll et al., 2018; Stockard et al., 2018). Based on the trend unfolding in my limited research, concentrating on constructivist learning strategies for classroom instruction is failing students at lower levels of academic ability.

Analysis of Survey Relating to Constructivists Practices in the Classroom

This section addresses the second research question of which constructivist-type activities teachers use in their lessons. The time allotments differ in this section from the first section in that time is not specific to one class period. For instance, if students are researching a topic of their choice, the teacher may give 15 minutes out of the total class period, but the research process may last two weeks. A teacher may not use all the constructivist activities in every class.

Categories of constructivist learning are from the Partnership of 21st Century Skills (2008). On the survey, these skills include collaboration, presentation, creativity, critical thinking, global awareness, community awareness, and technology integration. A discussion of subcategories under each primary 21st-century skill is in each section.

Collaboration

I analyzed data using crosstabulation to assess how much time teachers spend on collaborative activities. There are four subcategories of collaboration for this study. They include small group work, joint projects, group presentations, and peer feedback. Table 6 shows the minutes for each subcategory by subject and academic level.

Table 6

Collaboration Minutes

	ELA			Math
	Reg./Inclusion	Advance	Gifted and Talented	Regular/Inclusion
Small Group	40	60	70	30
Joint Projects	15	60	15	60
Presentations	15	10	15	30
Peer Feedback	30	20	20	30

Small Group. ELA teachers responding to the survey reported more average minutes for group work in their advance and GT classes than in regular education classes. Out of the 90-minute class, GT teachers gave 78 % of the total time to group work. The

only advanced teacher to respond gives 67% of class time to group work. The regular education teachers gave 45% of class time on average. Math teachers averaged spending 33% of total class time with students working in groups.

Joint Project. The next subcategory for collaboration is letting students work together on joint projects. The GT teachers reported giving students 15 minutes for collaborative projects. Regular education teachers reported 15 minutes. The advanced teacher said to give 60 minutes for this activity. Unfortunately, I could not interview the teacher of the advance class to find out why she gives students much more time to work on projects. The GT teacher I was able to interview said that when she assigned a group project, she usually gives 15 minutes a class period to work on that project over a one to two weeks span for completion. The advance teacher may have projects that take much less time to complete; therefore, she gave a third of her class for a few days. The average minutes reported for joint projects by math teachers were 60 minutes. I was able to interview one math teacher. She said that her projects took one to two days to complete.

Group Presentation. Group presentation is another subcategory of collaboration for this study. Regular/Inclusion and GT teachers reported an average of 15 minutes spent on group presentations. The ELA teachers I asked about this time s they given 15 minutes per group to present. They let them all present before moving on to the next lesson. They both reported usually getting through all groups during one class period. The advanced teacher said to give 10 minutes for group presentations. Math teachers averaged giving 30 minutes for this. The math teacher I interviewed stated she rarely had group

presentations, but when she did, she had groups present for 10 to 15 minutes each, up to 30 minutes each class period.

Finally, ELA teachers used peer feedback for editing suggestions on all writing assignments. For example, the math teachers used peer editing to check for accuracy in solving math problems. All levels give 20 minutes or about 25% of class time.

Presentation

Presentation is the next category of 21st-century skills on the survey. This category includes both group and individual presentations. In addition, the section evaluated the amount of time for data reports, multimedia presentations, and oral reports. Table 7 shows the time distribution for each type of presentation among ELA and Math teachers.

Table 7

Presentation Minutes

	ELA			Math
	Reg/Inclusion	Advance	Gifted and Talented	Regular/Inclusion
Data Report	15	0	20	20
Multimedia	10	20	15	60
Oral	15	10	10	20

Data Reports. GT teachers give students 20 minutes of class to present data reports, whereas regular education teachers give 15 minutes. The advance teachers reported not using any minutes for data reporting. During my interview with ELA

teachers, I asked what each considered data reports. All interviewees said they thought of data reporting as teaching the class what learning occurred during a research project. The average time spent on data reporting in math classes was 15 minutes. During an interview, one of the math teachers stated that she considered data reporting as any report students gave during her math class. For example, she said she had them compare current prices of goods to prices 50 years ago, then find the percentage increase for each item. When the students shared their projects, she considered the presentation as data reports. She said all her student presentations would be data reports since the class is about numbers. Math teachers did not report using this format for student presentations.

Multi-media. The following presentation format on the survey questions is about multi-media presentations. Multi-media can mean using computer programs to assist in presentations, interviews, or other literary forms. Regular education teachers of ELA give 10 minutes for students to present, and GT offers 15 minutes. The advance teacher reported giving 30 minutes for students to show using multi-media formats. The time differences could be due to the students using several formats per presentation rather than just a slide presentation or short video. Again, the math teachers did not report using this format.

Oral Presentations. The last subcategory for presentation **is** oral presentations. Advance and GT teachers give students, on average, 10 minutes to present orally. Regular education teachers provide an average of 15 minutes for oral presentations. Math teachers reported not using oral presentation; however, the interviewed math teacher did say that she had students present findings to the class by telling them what they were

finding. The overlap in types of presentations may have been confusing for the responders.

Create

Another 21st Century or constructivist skill is creating. The skill to create refers to the student's ability to create original thoughts, plans, or projects. Subcategories under create are brainstorming, problem-solving plans, and responding to open-ended questions. Table 8 shows the minutes participating teachers used for each subcategory of create.

Table 8

Create Minutes

	ELA			Math
	Regular/Inclusion	Advance	Gifted and Talented	Regular/Inclusion
Brainstorming	40	60	70	30
Plans to Solve Problems	15	60	15	60
Solutions to Open-ended questions	15	10	30	30

Brainstorming. For brainstorming, ELA regular/inclusion teachers give a student, on average, the same amount of time to brainstorm as the GT teachers. For example, when the teacher uses the strategy of the day's lesson, both teachers give 50 minutes or 56% of the class period. On the other hand, the advance teacher reported giving only 20 minutes for storming. Brainstorming and concept maps are effective

strategies to help improve writing for all students (Rahmawati, 2022). Math teachers, on average, do not give time for brainstorming; however, the next category explains this data.

Plan Steps to Solve a Problem. The next subcategory under the skill of create is the ability to plan steps to solve a problem. Average time regular/inclusion teachers give for this activity is 25 minutes or 28% of class time. The advance teacher gives 20 minutes, and GT teachers averaged 30 minutes for planning. Math teachers averaged 45 minutes for students to plan to solve a problem. The math teacher interviewed stated that when students attempt solving word problems or any other math equation, she gives them half the class; however, that does not mean they work on only one problem. She equated braining storming the same as planning and stated that all math problems require the planning state before attempting to solve them.

The last subcategory under create is developing solutions to open-ended questions. Open-ended questions require the student to generate a response based on prior knowledge and sometimes opinions. Regular education teachers reported giving students the most time for these questions. Their average time for responding to open-ended questions is 45 minutes or half of the class period. The advance teacher gives 20 minutes, and the GT teachers averaged 10 minutes for this activity. Reduced time for questions requiring more engagement of prior knowledge directly relates to the higher academic level of students. Math teachers reported an average allotment of time for responding to an open-ended question with 30 minutes. Again, the interviewed math teacher stated that

this time allotment does not mean 30 minutes per question; rather, 30 minutes for several open-ended questions.

Critical Thinking

Critical thinking encompasses 21st-century skills. Critical thinking occurs in planning, creating, evaluating, and synthesizing information. The specific areas of critical thinking assessed on the survey are planning an original project, choosing a topic to study, planning steps to complete a task, choosing a resource to use, using a rubric to revise, and using feedback to revise. Table 9 shows the average time allotted to critical thinking activities in ELA and Math.

Table 9

Critical Thinking Minutes

	ELA			Math
	Reg/Inclusion	Advance	Gifted and Talented	Regular/Inclusion
Plan an Original Project	10	10	10	0
Choose Topic to Study	15	10	10	0
Plan Steps to Complete Tasks	10	20	10	0
Choose Resource	10	20	10	0

Use Rubric to Revise	20	30	25		45

Plan an Original Project. On average, ELA teachers of all levels give ten minutes to plan an original project. In contrast, math teachers did not report allowing students to choose a topic to design an original project. The math teacher I interviewed said she did not have time for projects.

Steps to Complete a Task. The participating teachers give 10 minutes for planning steps to complete a task for both regular education and GT students. The advance teacher gives 20 minutes. Again, the math teachers reported not using this strategy.

Use Rubric to Revise. Teachers allow students to use the strategy of using a rubric and feedback to revise their work less in a regular education classroom than in advance and GT classes. The math teacher responding to the survey gave 45 minutes to use critical thinking skills. I was able to interview this teacher. She said student revision comes from her marking mistakes on the students' work, then having them correct it

Global Studies

Global Study is an area of constructivist learning developed by the Global Education Reform Movement or GERM (Verger, 2019). GERM pushed for teacher accountability at the state level through high-stakes testing and emphasizing learning about the global economy (Shalberg, 2016). Subcategories for global studies are studying

other countries, using ideas of different cultures, and understanding the life of other cultures.

All Subcategories for Global Studies. For every level of education and all subcategories for global studies, teachers reported giving, on average, ten minutes of class time when used. The GT and regular education teachers interviewed said they use articles to introduce and discuss other cultures. However, they also stated that giving extra time to complete global students takes away from teaching ELA standards, so they do not look for specific articles. Instead, they reported introducing other cultures when arising in the set curriculum.

Math teachers reported using 15 minutes for cultural ideas and understanding life in other countries. But, again, the math teacher I interviewed said she accomplished this through short articles and seldom used.

Community Studies

Community students are part of constructivist learning and 21st-century skills to promote awareness of subcultures, economics, and problems of the area in which students live. The subcategories of community studies are studying topics relevant to the community, applying learning to community problems, and understanding the community's needs.

Community Awareness. Regular education teachers give, on average, 15 minutes to topics relevant to the community, whereas advance and GT teachers give 20

minutes of class time. All teachers reported using local newspapers and class discussions for community awareness.

Apply Learning to Community Needs. Teachers reported the same time allotments for applying learning to community needs. However, no teacher interviewed explained what the activities looked like besides newspapers and class discussions assisted in community awareness.

Understanding the Needs of the Community. The Gifted and Talented ELA teachers reported using less class time for this subcategory than for applying learning to community needs. The GT teacher I interviewed said she regularly used around 20 minutes when community articles were read and discussed. Regular and advance teachers consistently reported class time given to community studies. Surprisingly, math teachers did not study topics relating to the community. The math teacher I interviewed stated that she introduced other cultures through short articles with a math theme from online sources. She did not use articles from local papers.

Technology Integration

Since the world revolves around technology, proficiency in using it to communicate is an essential category of constructivist learning and 21st-century skills. For this study, subcategories of technology integration use technology for learning, resources, evaluating, presenting, collaborating, and tracking. Participants of this study did not view online programs for math and ELA as direct instruction. However, if the program design gives immediate feedback and instruction for correcting wrong answers,

then the program teaches students directly. Table 10 shows the average minutes used for each subcategory.

Table 10

Technology Integration Minutes

	ELA			Math
	Reg/Inclusion	Advance	Gifted and Talented	Regular/Inclusion
Self-Learning	20	20	20	45
Online Resources	20	10	50	30
Evaluate Resources for Validity	15	10	20	5
Presentations	25	30	50	0
Collaboration	20	30	30	10
Track Assignments	40	20	55	40

Technology for Self-Learning and Online Resources. On average, the participating regular education teachers spend 45 minutes letting students use online programs to learn skills and to find resources to assist in learning. The ELA advance teacher gives students 40 minutes, and the GT teacher gives 70 minutes. Typically, GT students are more capable of being self-learners than regular/inclusion students (Roll et al., 2018; Stockard et al., 2018). The GT students' ability to be self-learners could account for the large discrepancy in time allotment between academic levels.

Math teachers, on average, give the students 75 minutes to use technology for self-learning and finding resources. However, of the three math teachers participating, only one reported having 60% of her students consistently meet their targeted academic growth. The only successful math teacher was also the only teacher to divide her time evenly between direct instruction and student-led activities. The other two math teachers whose students did not meet adequate growth used the majority of class time on computer-based programs.

Evaluating Online Resources for Validity. Determining the validity of online resources for research is an ELA state standard (SCDE, 2015). Regular education teachers reported using 15 minutes of class time for this skill, while the advanced teacher only gave 10 minutes. On average, GT teachers said giving 20 minutes to evaluate online resources for validity. It is unclear whether the participants reported the time used only by students to evaluate online resources or if it included the direct instruction necessary for scaffolding in teaching this skill. During my interview with the Gifted and Talented ELA teacher, she did say that she required more resources from online sites from her GT students than from her regular education students. The math participants averaged only 5 minutes for checking for validity. I did not ask the math teacher about the limited time allotment during our interview; however, online math programs are typically for practice rather than for research.

Technology for Presentations. Using technology for presentations involves the creation of the production. GT teachers reported using the most class time for students using online programs to prepare presentations. The interviewed GT teacher stated that

he required her students to go beyond a simple PowerPoint presentation. All levels of academics for ELA use a large portion of class time when students use technology to create presentations. This use of technology is indicative of the 21st Century computer-driven world. Math teachers reported no using technology for presentations.

Technology for Online Collaboration. Regular education ELA teachers reported using 20 minutes of class time for students to participate in online collaboration. Advance and GT teachers of ELA reported using 30 minutes of class time. Math teachers averaged only 10 minutes of class time. This finding is surprising given the overwhelming use of technology to collaborate and communicate in the real world. I wonder if the participants did not understand the score of online collaboration. Students can access GoogleDocs, GoogleMeet, and many other online collaboration tools.

Using Technology to Track Assignments. When tracking assignments using technology, regular education gives students, on average, 40 minutes during class, and the GT teachers give 55 minutes. The advance teacher reported giving only 20 minutes for this activity. I asked one GT teacher and one regular education teacher to explain what this means in their classes. Each said that they use GoogleClassroom for students' assignments. Each noted that, on average, students have the reported time to complete the work posted in GoogleClassroom. The regular education teacher said she gives students 40 minutes at the end of the week to catch up on missed assignments she posted in GoogleClassroom.

Participating math teachers give a lot of class time to tracking assignments. The math teacher I interviewed gave a similar explanation for this extended time. She stated she also uses GoogleClassroom to post assignments. In addition, she said that she usually uploaded worksheet lessons to a program called Kami so that the students could complete them online. She stated this kept her from overusing paper copies.

Interviews Relating to Types of Constructivist Learning Activities

All teachers I interviewed expressed the importance of balancing constructivist learning and direct instruction. For example, the Gifted and Talented ELA teacher I interviewed stated her students use more paper and pencil activities this year because she wants to see if that makes a difference in learning skills retention. She said she also teaches regular education classes that she did not use data from when completing the survey. She noted that her regular education students need at least half the class of direct instruction with the practice for several days before they can apply what they learn to new lessons.

The interviewed math teacher said that over the years, she has found her students stay focused with online tutorial math programs, but they depend on the program for the correct answer instead of teaching themselves the skill. She said that is why she is using online math programs sparingly.

I asked all five interviewees about their use of project-based and problem-based learning. Only two reported using these types of learning. The ELA Gifted and Talented teacher uses project-based or problem-based learning once a quarter, while the Regular

education ELA teacher uses project-based learning once a semester. The two ELA teachers and the math teacher reporting never using either type of learning said they had too many standards to teach and did not have time for projects of this type. They did not feel they could sufficiently teach the standards by incorporating them into the project. They felt a more direct method of teaching standards is more effective

The Gifted and Talented ELA teacher expressed her desire for students to use what they learn in a real-world situation, so she has a project each quarter. For example, she said her students completed reading a novel about an area facing drought. The story follows several characters' lives and how they dealt with the lack of water. Her students are now developing survival plans if their community faces severe drought.

The regular education teacher who said she uses project-based lessons also uses class novels. She has her students participate in activities relating to events in the novel that bring in cross-curricular topics. She used the example of reading the story of Phineas Gage, then researching each area of the brain. She says she includes math and social studies topics as well.

Discussion

Teachers responding to the survey used various constructivist learning strategies identified as 21st-century skills. While all interviewed teachers agreed that constructivist learning is necessary, they believe balancing it with direct instruction can ensure student success. Overall, GT and advance classes give more time for self-learning activities. Their decision to align their student-led lessons this way agrees with previous research

showing that advanced learners possess a stronger drive to acquire knowledge independently (Ronksley-Pavia & Neumann, 2020). On the other hand, regular/inclusion teachers may be giving too much time for student-led learning and not enough time for direct instruction.

Based on survey results and interview responses, teachers are not using problem-based or project-based learning activities because they feel the time takes away from teaching standards. However, research has shown that problem-based and project-based learning can improve skills learning (Chen & Yang, 2019; Siagan, Saragih, & Sinaga, 2019). Interviewed teachers said they feel very stressed because they have so many standards to cover. Three of the interviewed teachers noted that the current ELA standards are comprehensive but do not allow for depth in knowledge. They feel like they must skim the surface of each skill associated with the standard. They said the speed of instruction covers all the standards but reduces learning for regular/inclusion students.

Survey Results Relating to the Principal's Role in Constructivist Learning

The final section of Chapter 4 addresses the 3rd research question of how building-level administrators are assisting teachers in developing a constructivist learning environment. Administrators are responsible for the master schedule of the school, as well as ensuring teachers get the needed professional development training to meet the school's needs, ensuring teachers gain the required professional development training to meet the school's needs.

The questions on the survey relating to scheduling by the administration team are the time for PLCs, shared planning, and department meetings. All participating schools have shared -level planning, which is either 90 minutes in one block or a split 90-minute planning period with student lunch dividing it. The schedule for the grade level and department meetings varies by school.

Professional Learning Communities. An understanding of Professional Learning Communities (PLCs) was unclear by those responding with a zero for the number of minutes per week they participate in one. A PLC is simply a group of like-minded educators planning together with a focus on improving the learning of students (Dufour & Dufour, 2010). Total minutes should include department meetings and some professional development meetings. I will discuss the discrepancy in the interview subsection regarding research question three. Table 11 shows the breakdown of reported minutes for PLCs.

Table 11

Time for Professional Learning Communities

Crosstab

Count

		Time for PLCs					
		0	10	15	30	168	Total
Response	One	1	0	0	0	0	1
	Two	1	0	0	0	0	1
	Three	1	0	0	0	0	1
	Four	0	0	0	0	1	1
	Five	1	0	0	0	0	1
	Six	0	1	0	0	0	1
	Seven	0	0	0	1	0	1
	Eight	1	0	0	0	0	1
	Nine	1	0	0	0	0	1
	Ten	0	0	1	0	0	1
	Eleven	1	0	0	0	0	1
Total		7	1	1	1	1	11

Only four of the eleven survey respondents reported having time for PLCs. Therefore, I cannot say if all the others do not know what a PLC involves or if they do not feel the time is productive. I will share later what I learned during the interview.

For those reporting time for PLCs, responder four said that the principal gives her 168 minutes a week, or about 30 minutes per day, to meet with her professional peers to plan lessons. Responder four also said she has 30 minutes daily for share planning. Since I know this school provides a 90 minutes planning period for all teachers, I can deduce that the other 60 minutes may be for either individual planning or planning among teachers of common subject areas. Grade-level meetings include all subject area teachers within that grade level. Responder seven also reports having 30 minutes a day for PLCs. Again, the same scenario must occur for her as for responder four.

Responders six and ten reported having only 10 and 15 minutes of PLC time daily. I cannot explain this time allotment. However, 10 or 15 minutes is insufficient to effectively plan curriculum or other activities for improving student learning.

Shared Planning. Time allotments for shared planning may help explain the short time reported for PLC meetings. Only responder six has the same time marked for shared planning time as she does for PLCs. Both show 10 minutes. Again, this is not adequate time for a PLC meeting; however, she may interpret PLCs as the time she spends talking to other teachers about her subject during a planning period

Those reporting having 450 minutes of shared planning put the total time per week. The planning time per day is 90 minutes. Four participating teachers reported per

day of 90 minutes. The two reporting 360 minutes of shared planning have 72 minutes of shared planning per day. I cannot say what the remaining 18 minutes entail. Responder two reported having 30 minutes for shared planning. Since I know every school has a 90-minute planning period, I can only speculate the 30 minutes reported for shared planning is the time she meets with other teachers. Likewise, responder three reported having only 20 minutes of shared planning, so the remainder of the 90 minutes must be individual planning.

Responder eight reported having no shared planning time with her peers. This would be possible if she were a special education teacher who visits all the inclusion classes. If this is the case, her planning will not match any grade level.

Department Meetings. Department meetings can be once a week or once a month. My interviews were from two of the three participating schools. Of those I interviewed, the department meeting is once a month. Therefore, department meetings would be those by subject.

For this analysis, some teachers reported having zero minutes allotted for department meetings. However, after interviewing five teachers, answering the minutes as zero does not align with all five reported having department meetings. For instance, I interviewed responder 11; she marked that she had no department meetings. However, another teacher of the same subject in that school reported meeting 45 minutes per month for department meetings. Therefore, it is not likely the school for which I had no one willing to give me an interview does not have department meetings. Another possible

reason for reporting no time for department meetings could be the participant's frustration with how the meetings go. For example, two teachers I interviewed stated that their meetings consisted of complaints about students' behavior and rarely helped with teaching practices for their subject.

Two of the responders reported having only 10 minutes for department meetings. I did not interview either participant. A 10-minute session would not lend itself to robust planning and discussion about the subject area.

I learned from interviews that grade-level teachers of the same subject often meet during their planning period to discuss upcoming units and tests. Two of the ELA teachers I interviewed said that all the ELA teachers in her grade level hall meet weekly to plan future units and assessments. The ones reporting having only a ten10-minute department meeting may have some method of checking in with a department chair. Their core department planning takes individual grade levels.

Training for 21st-Century Skills. Questions on the survey asked how their principal assists them with developing a 21st-century learning environment. Five survey participants reported having no help teaching and utilizing 21st century skills.

All except responder five marked that they also did not have department meetings. Again, this may be an oversight, or some may not be satisfied with the training provided. I interviewed responder five, who has never received direct training on developing a 21st-century or constructivist learning environment.

In an interview with responder one, she stated that she reported getting 90 minutes of training for 21st-century skills because she is part of the STEM cohort for the county. She also said that scheduled meetings amounted to 90 minutes a week.

Discussion

Building-level administrators set internal planning schedules and extra PD sessions to meet their school's needs. Many teachers reported insufficient time for productive meetings to improve student learning. All participating schools have 90-minute planning periods. Most have planning for individual subjects. Interviewed teachers voiced frustration concerning meetings that were not productive. All that expressed frustration mentioned that their grade and department-level meetings consist of complaints about misbehavior. The purpose of grade-level meetings is to discuss grade-level issues. Therefore, it is understandable if discussions of discipline problems take over the meeting.

On the other hand, department meetings are to review district and state requirements for each subject area and to discuss methods of teaching the subject skills. Discipline should not overtake these meetings. The principal of a school is responsible for the learning environment; therefore, the principal should have a system in place to monitor discussions to improve student learning.

Voelkel & Chrispeels (2017) found that successful PLCs meet often and regularly. The PLC must be part of the school’s teaching program, and teachers must believe that working together can make a difference in student success. PLCs enhance

collective teacher efficacy or think they can positively impact student learning. ELA teachers stated during their interviews that the time given for department or subject area meetings is not helping to improve learning. The principal is responsible for promoting the importance of PCLs and providing time for teachers to work with like-minded professionals. Student success in learning is the purpose of education.

Finally, reporting time for training using 21st Century skills was as sporadic as time for PLCs. The P21 (2008) initiative focuses on preparing students for the ever-changing world. Teachers must give opportunities for students to use soft skills during classroom activities. Teachers master the art of teaching their subject of expertise. At the school level, teachers need opportunities to work with peers to discuss how to incorporate soft skills and efficiently implement constructivist learning into their lessons. Several teachers stated they do not use extended constructivist addresses because it takes away from teaching standards. Other teachers use various constructivist or 21st Century skills daily in their instructional practices. The building-level administrator's responsibility for ensuring all teachers prepare students effectively for our changing world. An effective way to help teachers is to provide opportunities for PLCs in the school's instructional practices.

CHAPTER FIVE

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Summary

This explanatory sequential mixed method study aimed to explore how teachers meet high-stakes testing demands while providing a 21st-century learning environment. This section includes a summary of the research and a discussion of the implications of findings on student learning. It also includes recommendations for future research to answer the questions:

1. How do select classroom teachers allocate instructional time between direct standards-based instruction and constructivist teaching practices while maintaining adequate student growth as measured by SCREADY and MAP?
2. What types of pedagogical practices are teachers using to meet the demands of the Profile of the S.C. Graduate?
3. What are school-level administrators doing to help classroom teachers provide opportunities for constructivist learning practices?

Under the Obama administration, Every Student Succeeds Act (ESSA, 2015) replaced No Child Left Behind (NCLB, 2002). ESSA transferred administrator and teacher accountability from the federal to state levels. In some South Carolina schools, administrator and teacher evaluations are on student test scores using value-added measures (S.C. General Assembly, 2017). Many states have adopted a value-added

educator evaluation system (Harris, 2011). South Carolina's state test is SCREADY. In addition to SCREADY, the participating school district uses the Measures of Academic Progress (MAP) assessment to monitor student academic growth. The MAP assessment aligns with South Carolina's state test to predict successful student growth on SCREADY (S.C. Department of Education, 2020b). Attaching student scores to measure the effectiveness comes with consequences. High-stakes test scores can affect funding, employment, and accreditation for schools and districts (Olmedo & Wilkins, 2017).

Two other educational reforms arising from the need to improve education in America were Global Education Reform Movement (GERM) (Verger, 2019) and The Partnership for 21st-century Skills (P21, 2008). GERM's focus is on preparing students to contribute to the global economy. P21 leaders lobbied legislators to add the education of soft skills as part of schools' required curriculum. Soft skills include communication, collaboration, creativity, and innovation. They also promote education focused on inquiry and critical thinking skills. The focus on preparing students for the real world originated from constructivism. Constructivists believe that learning comings from life experiences (Ertmer & Newby, 2013).

A push to use high-stakes testing to evaluate educators while requiring teachers to develop 21st-century learning environments has created a discrepancy in pedagogical practices (Craig, 2012; Farvis & Hays, 2020; Gonzalez et al., 2017; Morgan, 2016). Teachers often feel they must structure classroom practices focused on a procedural way of teaching to ensure all students are prepared for the high-stakes test (Guinn et al., 2016; Jones & Egley, 2004, Popham, 2001). Direct instruction enhances student retention of

information and test scores (Li & Xiong, 2018; Phelps, 2016, Thomas, 2005, stockyard et al., 2018; Wurdinger, 2012). The disadvantage of direct instruction is that it provides few opportunities for students to use higher-order thinking skills (Adamson & Darling-Hammond, 2014).

On the other hand, constructivist learning is essential in preparing students for real-world careers. Constructivist and discovery learning create opportunities for students to guide learning using prior knowledge while the teacher becomes the facilitator (Bell, 2010; Bruner, 1961; Hunt, 2010; Wurdinger, 2012; Yilmaz, 2011). 21st Century classrooms provide opportunities for students to learn through collaboration, problem-solving, and developing plans for overcoming problems. Constructivist learning involves complex projects like Problem-Based learning to simple class activities like Think-Pair-Share. The disadvantage of allowing students to drive their understanding is that they may make wrong conclusions, and projects are often time-consuming. Students often need scaffolding through direct instruction to build background knowledge before completing tasks independently (Kirschner et al., 2016; Lazonder & Harmsen, 2016; Roll et al., 2018).

Preparing students to be successful on high-stakes testing while preparing them for the 21st century must begin with administrators. Administrators should lead by demonstrating the P21 skills of collaborative learning, problem-solving, goal-setting, and time management (Dufour & Dufour, 2010). Part of the P21 (2009) initiative asked school administrators to develop professional learning communities (PLCs) within their schools. A PLC consists of professional groups working together to achieve

organizational goals. School administrators are responsible for school goals, then building capacity within the school to achieve the goal. In addition, administrators are responsible for scheduling opportunities for PLC among subject area teachers. Unfortunately, most teachers participating in this study did not report time for PLC. It is unclear if they did not understand what a PCL included or if they genuinely did not have time to meet with like-minded educators.

Findings

It is essential to bridge the gap formed by the need to prepare students for high-stakes testing and the need to prepare students for our changing world. Active Learning Time (ALT) is when the teacher stops direct instruction, and students are involved in self-learning activities. Some students may succeed on state testing with more ALT than direct instruction, while others require more scaffolding through direct instruction to be successful on high-stakes tests. Bakker (2018) warned against teaching strategies where one practice takes over the other without a balance to meet the needs of all students. This study found that constructivist learning is an overwhelming focus among teachers who participated. Varying students' academic levels did not affect classroom practices' decision-making process.

Time Allotment

Although this study had few participants, it allowed the discovery of a trend. Advanced learners still meet targeted academic growth with 70% or more class time dedicated to constructivist learning. Academically advanced students process a more

remarkable ability to think critically and solve problems. They typically strongly desire to learn (Karagol & Bekmezci, 2015). However, most students did not meet targeted academic progress when the teacher used 60% or more class time on constructivist learning in a regular education class. These students need more explicit instruction from the teacher to internalize learned skills before successfully transferring the learning to themselves (Roll et al., 2018).

Use of Constructivist Learning Strategies in the Classroom

The study results showed that all participating teachers use a variety of constructivist learning in their classroom practices. The use of focused skills for 21st-century learning occurs throughout the year. Collaborative work is the most significant time allowance for constructivist-type learning. The findings on using computer-based learning were about the same for all academic levels. Again, the student's academic level was not a factor in deciding how much time to give students with a self-learning program.

Teacher interviews explained that they gave most class time to constructivist learning. All five teachers interviewed stated that district leaders ask teachers to spend no more than 15 minutes for direct instruction. The teachers said they facilitate learning by helping individuals and groups struggling with the assignment. No participating teacher counted facilitating individuals as direct instruction. Although this practice is part of explicit instructional learning, classes of regular education students still tested below expected academic growth.

Role of Administrator

Most participants did not understand the concept and purpose of professional learning communities (PLCs). Most stated that time they spent with their peers resulted in discussions about student behavior more than planning curriculum. In all schools, administrators developed a schedule for all teachers to have 90 minutes of planning. Once a month, grade level teachers meet and once a month department teachers meet. As reported by the participating teachers, administrator presence did not seem to be a significant part of the meeting's procedure. All teachers I interviewed stated that their building level administrator gave them sufficient time to plan and enough professional development on planning 21st Century learning environments. However, the administrators failed to prepare and demonstrate effective PLCs, and they did not ensure that discussions of discipline did not interfere with developing the best learning environment for all students. PLCs are not effective unless the administrator builds buy-in and capacity among all educators in the school (Schaap & de Bruijn, 2018).

Implications

The education reform pendulum has missed the needs of all students with such a narrow focus on constructive learning while still holding teachers and leaders to a standard based on student test scores. Most teachers feel they must prepare students for the test, while knowing they must be more of a facilitator in a constructivist learning environment. Administrators know test scores evaluate them, so they may want to

provide professional development opportunities to improve content learning instead of collaborative learning and problem-solving.

Based on this study, teachers provide students with opportunities to be self-learners and collaborative learners. However, what happens to our society if many students enter the workforce unable to comprehend what they read or use essential math functions? Teachers interviewed for this study stated that current academic standards and inquiry learning cause horizontal learning of many skills without the depth to master those skills. According to ProLiteracy (2023), 43 million adults cannot read, write, and complete fundamental math problems above a 3rd-grade level. Yet, as Bakker (2018) warned, educators cannot turn away from content mastery when preparing students to be collaborators, problem solvers, and creators.

Educational policymakers cannot overshadow academic learning in an effort to keep up with global markets. With more and more baby boomers retiring, skilled workers are in demand (Dohm, 2000). All skilled workers need basic skills in reading, wiring, and math. Many careers require advanced knowledge and skills required in the job.

To bring the pendulum back to the center, the time allotted for preparing students for the test and time for constructive learning should vary from class to class based on the specific needs of the students. Scaffolding learning for student success must match the student's needs. For example, advanced learners tend to have a greater ability to internalize information, use new skills, and think critically (Rodríguez et al., 2019 & Van Sickle et al., 2019). Other learners may need more time with direct instruction and

practice before moving on to collaborative work or self-directed computer programs used for learning. Unlike world markets, learning is not a globalized idea. The ability and speed at which a person learns is individualized. Allowing administrators and teachers to design learning environments to accommodate individuals requiring more direct instruction should be an integral part of evaluating the effectiveness of education. A need to understand the balance for teaching 21st century skills and teaching for mastery should lead educational reform.

Recommendations for Further Research

A robust study needs to occur to determine if the findings of this study are generalizable across other school districts and states. An in-depth analysis of effective class practices concerning time allotments will assist in developing professional development for meeting high-stakes testing demands and 21st-century skills.

Surprisingly, many participants of this study did not understand the purpose of PLCs or reported the time was not productive in preparing students for success. A survey of how administrators prepare faculty for PLC times and monitor the effectiveness of each professional group will help more schools transform into a 21st-century learning environment.

Finally, more research on using constructivist learning to meet students' diverse needs will help teachers decide how to use these strategies best to meet the needs of varying academic levels. Teachers can access many student-led computer programs for learning, collaborative learning activities, and critical thinking lessons. However, the

teachers in this study did not match constructivist learning strategies to the student's academic level.

APPENDICES

APPENDIX A

RESEARCH SURVEY

Pedagogical Practices in the Classroom

Q1 Please provide name and school if I may contact you for follow-up questions.

_____

Q2 Which subject do you teach?

▢ ELA

▢ Math

Q3 Which do you teach? Select the level on which you will base your answers.

o Regular Education

o Advance Education

o Gifted and Talented Education

Q4 Did 60% or higher of total students meet their academic goal set by MAP in the following years? 2020 is not included since no test was administered during the spring of quarantine. Please answer 1 for yes and 2 for no.

Percent of students meeting academic goal in 2022 : _____

Percent of students meeting academic goal in 2021 : _____

Percent of students meeting academic goal in 2019 : _____

Percent of students meeting academic goal in 2018 : _____

Q5 Collaboration: In your class, how much time do your students spend doing the following (answer in average minutes per week)

Work in pairs or small groups to complete a task together? : _____

Create joint products using contributions from each student? : _____

Present their group work to the class, teacher, or others? : _____

Give Feedback to peers or assess other's work? : _____

Q6 Presentation: In your class, how often have you asked students to do the following (answer in average minutes per week spent on presentation development)

Structure data for use in written products or oral presentations? (ex. creating charts, graphs, written presentations) : _____

Convey their ideas using media other than a written paper? (ex. videos, blogs, posters, etc.) : _____

Prepare and deliver an oral presentation to the teacher and others? : _____

Q7 Create: In your class, how often have you asked students to do the following (answer in average minutes per week)

Use idea creation techniques such as brainstorming or concept mapping? : _____

Generate their own ideas about how to confront a problem or questions? : _____

Invent a solution to a complex, open-ended question or problem? : _____

Create an original product or performance to express their ideas? : _____

Q8 Critical Thinking: In your class, how often have you asked students to do the following (answer in average minutes per week)

Choose their own topics of learning or questions to pursue? : _____

Plan the steps they will take to accomplish a complex task? : _____

Choose for themselves what examples to study or resource to use? : _____

Use specific criteria to assess the quality of their work before it is completed? (e.g. Rubric) : _____

Use peer, teacher, or expert feedback to revise their work? : _____

Q9 Global Awareness: In your class, how often have you asked students to do the following (answer in average minutes per week)

Study information about other countries? : _____

Use information or ideas that come from people in other countries or cultures? : _____

Understand the life experiences of people in cultures besides their own? : _____

Q10 Community Awareness: In your class, how often have you asked students to do the following (answer in average minutes per week)

Investigate topics that are relevant to their family or community? : _____

Apply what they are learning to local situations, issues, or problems? : _____

Respond to a question or task in a way that weighs the concerns of different community members? : _____

Q11 Technology Integration by Student: In your class, how often have you asked students to do the following (answer in average minutes per week)

Use technology or the internet for self-instruction? (computer programs, HyperDocs, etc.)

Self-select appropriate technology tools or resources for completing a task? : _____

Evaluate the credibility and relevance of online resource? : _____

Use technology to help them share information? (presentations, papers, podcasts, video, etc) : _____

Use technology to support team work or collaboration? (shared work spaces, email, GoogleDoc, etc.) : _____

Use technology to keep track of their work on extended tasks or assignments? (Profiles, Google Sites, etc.) : _____

Q12 Direct Instruction with paper practice: In your class, how often do your students experience these (answer in average minutes per week)

Direct instruction followed by paper worksheet? : _____

Direct instruction followed by paper/pencil journal entries about a skill taught? : _____

Direct instruction followed by written reports? : _____

Q13 Direct Instruction followed by teacher assigned computer practice: In your class, how often do your students experience these (answer in average minutes per week)

Direct Instruction followed by computer program practice? : _____

Direct Instruction followed by response to a prompt on GoogleDoc or other computer response program? : _____

Direct Instruction followed by a typed report on teacher assigned topic? : _____

Q14 In your class, how often do your students experience this (answer in average minutes per week)

Direct instruction on how to respond to a state released TDA passage/prompt? : _____

Direct instruction followed by practice with state testing release questions? : _____

Direct instruction followed by assessment questions that mirror state assessment questions? : _____

Q15 Assessments: In your class, how often do your student experience these types of assessments (average minutes spent on a test per week for each type of assessment)

Multiple Choice Only : _____

Open-ended and discussion questions : _____

Combination of multiple choice and open-ended/discussion : _____

Solving numeric math problems only : _____

Solving numeric and word problems in math : _____

Q16 In your class, how often do your students experience these

	Never	Once a Quarter	Once a Month	2 to 3 Times a Week	Everyday
Think Pair Share?	o	o	o	o	o
Fish Bowl?	o	o	o	o	o
Jig Saw?	o	o	o	o	o
Debate?	o	o	o	o	o
Peer Editing?	o	o	o	o	o
Project Based Learning?	o	o	o	o	o
Problem Based Learning?	o	o	o	o	o
Service Learning?	o	o	o	o	o
Research on self-selected topics?	o	o	o	o	o

Q18 Please provide a list of other teaching strategies you use on a regular basis in your class with days spent on each strategy.

_____

Q19 How often does your principal provide the following support (answer in average minutes per week)

Provide meeting times for Professional Learning Communities (PLC) : _____

Shared planning within a grade level? : _____

Department meetings to discuss teaching strategies? : _____

Profession development opportunities for teaching 21st Century Skills? : _____

Q20 Please provide any additional support you receive from your principal that helps you create a learning environment which supports success on state assessments and teaching 21st Century skills.

_____

APPENDIX B

INTERVIEW PROTOCOL

Interviewee _____

School _____

Subject and Level (Reg. Ed., Sp.Ed., GT) _____

Interviewer _____

Focused Survey Questions: (Check those explored during the interview.)

A. Cooperative Learning (Q4) _____
B. Products/Presentations (Q5) _____
C. Critical Thinking/Self-Direct (Q6, Q7) _____
D. Global/Community Awareness (Q8, Q9) _____
E. Technology (Q10) _____
F. Direct Instruction (Q11, Q12, Q13) _____
G. Assessments (Q14) _____
H. Specific Constructivist Teaching Techniques (Q15, Q16) _____
I. Administrative Support (Q17, Q18) _____
J. Instructional Time Allotment for Direct Instruction and 21st-Century Activities _____

Interview Questions for each focused area: (Questions used during the survey will be determined by the participant's survey answers.)

A. Cooperative Learning

a. Explain how you create your groups for cooperative learning.

b. Explain the benefits and struggles you have experienced using cooperative learning.

c. You reported using cooperative learning activities every day. Please describe and explain your daily class schedule.

d. You reported that cooperative learning activities are seldom used during class. Please explain your decision to use less time for this type of instruction.

e. Please explain why you feel that students learn best through cooperative learning or do not learn best through cooperative learning.

B. Products/Presentations

a. What types of products and presentations do you have your students complete?

b. Explain how time management determines the types of products and presentations your students complete.

C. Critical Thinking/Self Direction

a. How much time do you spend scaffolding with direct instruction before assigning students' projects for problem-solving and self-direction for obtaining information?

b. Explain your decision process for giving students information to complete a project vs. letting them find their own information.

c. How much does time affect your decision to give students resources for information vs. letting them find it on their own?

D. Global/Community Awareness

a. Describe a unit your use that focuses on global/community awareness.

b. You reported you have one global/community awareness project a semester. Please explain your decision for this time allotment.

c. You reported that you do not use global/community awareness lessons. Please explain your decision about this.

E. Technology

a. Please explain your success in aiding student learning using technology.

b. If you feel technology hinders student learning, please explain your reason.

c. Please explain if you feel student use of technology improves or hinders class time management.

F. Direct Instruction

a. Please explain why you spend more class time on direct instruction with practice than student-led learning.

b. Please explain why you spend less class time for direct instruction with practice than student-led learning.

G. Assessments

a. Please explain your reasons for using paper and pencil tests vs. projects in assessing for student mastery of skills.

b. Explain how students can show mastery by developing products and presentations.

H. Specific Constructivist Teaching Techniques

a. Explain your decision to use the teaching strategies you reported on the survey. (Interviewer will remind the interviewee which strategies they checked.)

b. You reported never using Problem-Based Learning. Please explain your decision to never use this strategy.

c. You reported using Problem-Based Learning Twice a Semester. Please describe these projects and how you allot class time to complete them.

d. Explain how limited class time affects the types of constructivist/discovery learning strategies you use.

I. Administrative Support

a. Explain how your administrators (building and district level) support you in class time management decisions.

b. What can your administrators do to help you develop a 21st-century classroom?

c. Do you feel supported in using constructivist/discovery learning techniques? Please explain your answer.

J. Instructional Time Allotment for Direct Instruction and 21st-Century Learning

a. Explain how high-stakes testing affects your decision to allot direct instruction time with practice vs. constructivist/discovery learning activities.
b. Explain your feelings on the quality of student learning using direct instruction with practice vs. constructivist/discovery learning techniques.
c. Explain your feeling on mastery of standards using direct instruction with practice vs. constructivist/discovery learning.
d. Do you feel a middle school teacher is responsible for teaching 21st Century Skills? Explain

REFERENCES

Abrahamson, D., & Kapur, M. (2018). Reinventing discovery learning: a field-wide research program. *Instructional Science*, 46(1), 1–10. https://doi.org/10.1007/s11251-017-9444-y

Darling-Hammond, L., & Adamson, F. (2014). *Beyond the bubble test: How performance assessments support 21st century learning.* John Wiley & Sons. https://ebookcentral.proquest.com/lib/clemson/detail.action?pqorigsite=primo&docID=1691504

Andrews, T. M., Leonard, M. J., Colgrove, C. A., & Kalinowski, S. T. (2011). Active learning not associated with student learning in a random sample of college biology courses. *CBE—Life Sciences Education*, *10*(4), 394-405.

Apple, M. (2017). What is present and absent in critical analyses of neoliberalism in education. *Peabody Journal of Education*, 92(1), 148–153. https://doi.org/10.1080/0161956x.2016.1265344

Baker, W. P., Barstack, R., Clark, D., Hull, E, Goodman, B., Kook, J., Kraft, K., Ramakrishna, P., Roberts, E., Shaw, J., Weaver, D., & Lang, M. (2008). Writing-to-learn in the inquiry-science classroom: Effective strategies from middle school science and writing teachers. *The Clearing House*, 81(3), 105–108. https://doi.org/10.3200/TCHS.81.3.105-108

Bakker, A. (2018). Discovery learning: zombie, phoenix, or elephant? *Instructional Science*, 46(1), 169–183. https://doi.org/10.1007/s11251-018-9450-8

Baird, E., Elliott, V. (2018). Metrics in education—control and corruption. *Oxford Review of Education*, 44(5), 533–544. https://doi.org/10.1080/03054985.2018.1504858.

Barkley, E., Major, C., & Cross, K. (2014). *Collaborative learning techniques: a handbook for college faculty* (2nd edition.). Jossey-Bass.

Bell, S. (2010). Project-nased learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39–43. https://doi.org/10.1080/00098650903505415

Billig, S.H. (2000). Research on K-12 School-Based Service-Learning: The Evidence Builds. *Phi Delta Kappan*, 81(9), 658–664.

Brookfield, S., & Preskill, S. (1999). *Discussion as a way of teaching: tools and techniques for democratic classrooms* (1st ed.). Jossey-Bass Publishers.

Bruner, J. S. (1961). *The act of discovery*. *Digital authorship*. Word Press. https://digitalauthorshipuri.files.wordpress.com/2015/01/the-act-of-discovery-bruner.pdf

Bruner, J.S. (1971). The process of rducation. Revisited. *Phi Delta Kappan*, 53(1), 18–21.

Bruner, J. S. (2009). *The process of education*. Harvard university press.

Bruner, J. S. (1978). The role of dialogue in language acquisition. In A. Sinclair, R., J. Jarvelle, and W. J.M. Levelt (eds.) *The Child's Concept of Language*. New York: Springer-Verlag.

Bush, G. (2006). Learning about learning: from theories to trends. *Teacher Librarian*, 34(2), 14-19.

Chase, K., & Abrahamson, D. (2018). Searching for buried treasure: uncovering discovery in discovery-based learning. *Instructional Science*, 46(1), 11-33.

Chen, C. H., & Yang, Y. C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review*, 26, 71-81.

Cooper, P.A. (1993). Paradigm Shifts in Designed Instruction: From Behaviorism to Cognitivism to Constructivism. *Educational Technology*, 33(5), 12–19.

Craig, C. J. (2012). "Butterfly under a pin": An emergent teacher image amid mandated curriculum reform. *The Journal of Educational Research*, 105(2), 90-101.

Creswell, J., & Plano Clark, V. (2018). *Designing and conducting mixed methods research* (Third edition.). SAGE.

Croft, S., Roberts, M., & Stenhouse, V. (2016). The perfect storm of education reform: high-stakes testing and teacher evaluation. *Social Justice* (San Francisco, Calif.), 42(1), 70–

Dahlbeck, D. T., & Lightsey Jr, O. R. (2008). Generalized self-efficacy, coping, and self-esteem as predictors of psychological adjustment among children with disabilities or chronic illnesses. *Children's Health Care*, 37(4), 293-315.

Dewey, J. (1938*). Logic, the theory of inquiry*. H. Holt and Company.

Dohm, A. (2000). Guaging the labor force effects of retiring baby-boomers. *Monthly Lab. Rev., 123*, 17.

DuFour, R. (2004). What is a" professional learning community"?. *Educational leadership*, 61(8), 6-11. http://www.siprep.org/uploaded/ProfessionalDevelopment/Readings/PLC.pdf.

Dufour, R. & Dufour, R. (2010). The role of professional learning communities. In advancing 21st-century skills. J. Bellanca, J., & R. Brandt (Eds.), *21st Century Skills Rethinking How Students Learn*. (77-95). Solution Tree Press.

Engelmann, S. (2014). Research from the inside: The development and testing of DI programs. *The science and success of Engelmann's Direct Instruction*, 3-24.

Engelmann, S., & Carnine, D. (1982). *Theory of instruction: Principles and applications*. New York: Irvington Publishers. https://www.researchgate.net/profile/Doug-Carnine/publication/303721842_Theory_of_Instruction_Principles_and_Applications/links/574f661a08aef199238ef8b6/Theory-of-Instruction-Principles-and-Applications.pdf.

Ertmer, P., & Newby, T. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 26(2), 43–71. https://doi.org/10.1002/piq.21143

Elliott, S. (2000). *Educational psychology: Effective teaching, effective learning* (3rd ed.). McGraw-Hill.

Every Student Succeeds Act (2015). S §1177. https://www.congress.gov/114/plaws/publ95/PLAW-114publ95.pdf

Farvis, J., & Hay, S. (2020). Undermining teaching: How education consultants view the impact of high-stakes test preparation on teaching. *Policy Futures in Education*, 1478210320919541.

Firestone, W., Monfils, L., & Schorr, R. (2004). *The ambiguity of teaching to the test: standards, assessment, and educational reform*. L. Erlbaum Associates Publishers.

Fisher, C. W., Berliner, D. C., Filby, N. N., Marliave, R., Cahen, L. S., & Dishaw, M. M. (1981). Teaching behaviors, academic learning time, and student achievement: An overview. *The Journal of classroom interaction*, *17*(1), 2-15.

Fox, R. (2001). Constructivism Examined. *Oxford Review of Education*, 27(1), 23–35. https://doi.org/10.1080/03054980125310

Giddings, L., & Grant, B. (2009). From rigor to trustworthiness: Validating mixed methods. *Mixed methods research for nursing and the health sciences*, 13(1), 119-134.

Goals 2000: Educate America Act (1994). H.R. § 1804. https://www2.ed.gov/legislation/GOALS2000/TheAct/index.html

Gonzalez, A., Peters, M. L., Orange, A., & Grigsby, B. (2017). The influence of high-stakes testing on teacher self-efficacy and job-related stress. *Cambridge Journal of Education*, 47(4), 513-531.

Guskey, T., & Anderman, E. (2013). In search of a useful definition of mastery. *Educational Leadership*, 71(4), 18–.

Gunn, J., Al-Bataineh, A., & Abu Al-Rub, M. (2016). Teacher's perceptions of high stakes testing. *International Journal of Teaching & Education*, IV(2). https://doi.org/10.20472/TE.2016.4.2.003

Harris, D. (2011). *Value-added measures in education: What every educator beeds to K\know*. Harvard Education Press.

Hastings, M. (2020). Neoliberalism and education. *In Oxford Research Encyclopedias*. https://doi.org/10.1093/acrefore/9780190264093.013.404

Heinrich, W., Habron, G., Johnson, H., & Goralnik, L. (2015). Critical Thinking Assessment Across Four Sustainability-Related Experiential Learning Settings. *The Journal of Experiential Education*, 38(4), 373–393. https://doi.org/10.1177/1053825915592890

Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: a response to Kirschner, Sweller, and. *Educational psychologist*, 42(2), 99-107.

Honebein, P. C. (1996). Seven goals for the design of constructivist learning environments. *Constructivist learning environments: Case studies in instructional design*, 11-24..

Huck, S.W. (2012). *Reading statistics and research 6th edition*. Pearson.

Hunt, T. (2010). *Encyclopedia of educational reform and dissent*. SAGE.

Jaramillo, J. A. (1996). Vygotsky's sociocultural theory and contributions to the development of constructivist curricula. *Education*, 117(1), 133+.

Jerald, C. D. (2009). Defining a 21st-century education. *Center for Public Education*, *16*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.460.8011&rep=rep1&type=pdf

Jones, B., & Egley, R. (2004). Voices from the Frontlines: Teachers' Perceptions of High-Stakes Testing. *Education Policy Analysis Archives*, 12, 39–. https://doi.org/10.14507/epaa.v12n39.2004

Kapur, M. (2008). Productive failure. *Cognition and Instruction*, 26(3), 379–424. https://doi.org/10.1080/07370000802212669

Karagöl, I., & Bekmezci, S. (2015). Investigating academic abilities and critical thinking dispositions of teacher candidates. *Journal of Education and Training Studies*, 3 (4). DOI: https://doi.org/10.11114/jets.v3i4.834

Kay, K. (2009). Middle Schools Preparing Young People for 21stCentury Life and Work. *Middle School Journal*, 40(5), 41–45.

Kaye, C. (2004). *The complete guide to service learning : proven, practical ways to engage students in civic responsibility, academic curriculum, & social action*. Free Spirit Pub.

Kidron, I. (2015). Epistemology and networking theories. *Educational Studies in Mathematics*, 91(2), 149–163. https://doi.org/10.1007/s10649-015-9666-3

Kirschner, P., Sweller, J., & Clark, R. (2016). Why ninimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41(2), 75–86.

Knuth, R.A & Cunningham. D.J. (1993). Tools for constructivism. In T. Duffy, J. Lowyck, & D Jonassen (Eds,), *Designing Environments for Constructivist Learning.*

Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. *Improving Schools*, 19(3), 267–277. https://doi.org/10.1177/1365480216659733

Lazonder,A.W., & Harmsen, R., (2016). Meta-Analysis of Inquiry-Based Learning: Effects of Guidance. *Review of Educational Research*, 86(3), 681–718. https://doi.org/10.3102/0034654315627366

Li, H., & Xiong, Y. (2018). The relationship between test preparation and state test performance: Evidence from the Measure of Effective Teaching (MET) project. *Education Policy Analysis Archives*, 26, 64–. https://doi.org/10.14507/epaa.26.3530

Maxwell, N., Mergendoller, J., & Bellisimo, Y. (2005). Problem-Based Learning and High School Macroeconomics: A Comparative Study of Instructional Methods. *The Journal of Economic Education*, 36(4), 315–329. https://doi.org/10.3200/jece.36.4.315-331.

Mayer, R. (2004). Should There Be a Three-Strikes Rule Against Pure Discovery Learning? The Case for Guided Methods of Instruction. *The American Psychologist*, 59(1), 14–19. https://doi.org/10.1037/0003-066X.59.1.14

McTighe, J., & Brown, J. L. (2005). Differentiated instruction and educational standards: Is détente possible?. *Theory into practice*, 44(3), 234-244.

McTighe, J. & Seif, E. (2010). An implementation framework to support 21st Century skills. In J. Bellanca, J., & R. Brandt (Eds.), *21st Century Skills Rethinking How Students Learn*. (pg. 152). Solution Tree Press.

Menken, K. (2017). High-stakes tests as de facto language education policies. In E. Shoham, I. Or, & S. May (eds). Language Testing and Assessment. *Encyclopedia of Language and Education* (3rd ed.). Springer, Cham. https://doi.org/10/1007/978-3-319-02261-1_25.

Morgan, H. (2016). Relying on high-stakes standardized tests to evaluate schools and teachers: A bad idea. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 89(2), 67-72.

Morgan, P. L., Farkas, G., & Maczuga, S. (2015). Which instructional practices most help first-grade students with and without mathematics difficulties?. *Educational Evaluation and Policy Analysis*, 37(2), 184-205.

Newell, R. (2003). *Passion for learning: how project-based learning meets the needs of 21st-century students*. Scarecrow Press.

No Child Left Behind Act of 2001, 20 USC § 6301 (2002). https://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf

Olmedo, A., & Wilkins, A. (2016). Governing through parents: a genealogical inquiry of education policy and the construction of neoliberal subjectivities in England. *Discourse (Abingdon, England)*, 38(4), 573–589. https://doi.org/10.1080/01596306.2015.1130026

Ormrod, J. (1995). *Educational psychology: principles and applications* ([1st ed.].). Merrill.

Partnership for 21st Century Skills. (2008). *21st Century skills, education & competitiveness: A resource and policy guide.* https://files.eric.ed.gov/fulltext/ED519337.pdf.

Partnership for the 21st Century Skills. (2009). *21st Century support systems.* https://static.battelleforkids.org/documents/p21/P21_Framework_Definitions_New_Logo_2015_9pgs.pdf

Phelps, R. (2016). Teaching to the test: A very large red herring. *Nonpartisan Education Review*, 12(1), 1–17. http://web.a.ebscohost.com.libproxy.clemson.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=4b0094d8-ca98-4012-bf8f-3b34fbad07d5%40sessionmgr4008

Phillips, D. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5–12. https://doi.org/10.3102/0013189X024007005

Piaget, J. (1976). *The origins of intelligence in children*. International Universities Press.

Popham, W. (2008). *Classroom assessment: what teachers need to know* (5th ed.). Pearson/Allyn and Bacon.

Popham, W. (2001). Teaching to the test? *Educational Leadership*, 58(6), 16–20. http://www.ascd.org/publications/educational-leadership/mar01/vol58/num06/Teaching-to-the-Test%C2%A2.aspx

ProLiteracy (2023). *Adult literacy facts*. https://www.proliteracy.org/Adult-Literacy-Facts

Rahmawati, E. (2022). The effect of brainstorming technique as a pre-writing activity on the students' achievement in writing descriptive text. *Journal Corner of Education, Linguistics, and Literature*, 2(1), 38-43.

Ravitz, Jason. (2014). *A survey for measuring 21st century teaching and learning: West Virginia 21st century teaching and learning survey* [WVDE-CIS-28]. 10.13140/RG.2.1.2246.6647.

Renner, M., & Taylor-Powell, E. (2003). Analyzing qualitative data. *Programme Development & Evaluation, University of Wisconsin-Extension Cooperative Extension*, 1-10.

Robertson, S. L. (2012). Researching global education policy: Angles in/on/out. *Global education policy and international development: New agendas, issues, and policies*, 33-51.

Rodríguez Naveiras, E., Verche Borges, E., Hernández Lastiri, P., Montero López, R., & Borges del Rosal, M. Á. (2019*). Differences in working memory between gifted or talented students and community samples: A meta-analysis*. Psicothema.

Ronksley-Pavia, M., & Neumann, M. M. (2020). Conceptualizing gifted student (dis) engagement through the lens of learner (re) engagement. *Education Sciences*, 10(10), 274.

Rose, M. (2015). School reform fails the test. *The American Scholar*, 84 (1): 18–30. http://web.b.ebscohost.com.libproxy.clemson.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=b3cabf25-4efe-4a3f-a670-069d63fa49aa%40pdc-v-sessmgr03

Rosenshine, B. (2008). Five meanings of direct instruction. Center on Innovation & Improvement, Lincoln, 1-10.

Sahlberg, P. (2016). The global educational reform movement and its impact on schooling. In *The Handbook of Global Education Policy* (pp. 128–144). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118468005.ch7

S.C. Council on Competitiveness. (2015). *State Board of Education adopts TransformSC's Profile of the Graduate*. https://sccompetes.org/state-board-of-education-adopts-transformscs-profile-of-the-graduate/.

S.C. Department of Education. (2015*). A review of the S.C. College-and-Career-Ready Standards in English Language Arts and Mathematics*. https://www.achieve.org/files/SouthCarolinaStandardsReview-08-31-15FINAL.pdf

S.C. Department of Education. (2020). *Assessment information*. https://ed.sc.gov/tests/assessment-information/

S.C. Department of Education. (2020a). *Ready to Work (R2W) and Essential Soft Skills (ESS) Assessments*. https://ed.sc.gov/tests/high/r2w/.

S.C. Department of Education. (2020b). *2019 S.C. Ready review report*. https://ed.sc.gov/tests/tests-files/sc-ready-files/2019-ela-test-data-review-grades-6-8/

S.C. Department of Education. (2020c). *Sample release items for SCPASS, SC READY, and EOCEP*. https://ed.sc.gov/tests/assessment-information/quick-links-for-teachers/sample-release-items-for-scpass-sc-ready-and-eocep/

S.C. Department of Education (2020d). *S.C. Ready ELA Test Blueprint Grades 6-8.* https://ed.sc.gov/tests/tests-files/sc-ready-files/ela-6-8-test-blueprint-for-2020-21/

S.C. Department of Education. (2020e). *South Carolina College- and Career-Ready Standards and Indicators for Grade 7*. https://ed.sc.gov/scdoe/assets/File/instruction/standards/ELA/SCCCRStandards%20OnePagerGrade%207%20ELA.pdf

S.C. Department of Education. (2020f). *Educator Effectiveness*. https://ed.sc.gov/educators/educator-effectiveness/.

S.C. General Assembly. (2016). H §4936. *Amendment to Article 1, Chapter 1, Title 59, Section 59-1-50*. https://www.scstatehouse.gov/sess121_2015-2016/bills/4936.htm.

S. C. General Assembly. S.C. Code §59-18-325 (2016). https://www.scstatehouse.gov/code/t59c018.php

S.C. General Assembly. §H3969. *Education Oversight Committee*. (2017). https://www.scstatehouse.gov/sess122_2017-2018/bills/3969.htm

Schaap, H., & de Bruijn, E. (2018). Elements affecting the development of professional learning communities in schools. *Learning environments research, 21*, 109-134.

Schlesinger, A. (2009). *The death of why?: the decline of questioning and the future of democracy* (1st ed.). Berrett-Koehler.

Schwab, J. (1960). Inquiry, the science teacher, and the educator. *School Review*, 68(2), 176–195. https://doi.org/10.1086/442536

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. Teachers College Press.

Sharma, G. (2017). Pros and cons of different sampling techniques. *International Journal of AppliedRresearch*, 3(7), 749-752.

Siagan, M. V., Saragih, S., & Sinaga, B. (2019). Development of learning materials oriented on problem-based learning model to improve students' mathematical problem solving ability and metacognition ability. *International Electronic Journal of Mathematics Education*, 14(2), 331-340.

Sorrell, E., & Ramsay, J. (2007). Problem-based learning: An adult-education-oriented training approach for SH&E practitioners. *Professional Safety*, 52(9), 41–49.

Soslau, E., & Yost, D. (2007). Urban service-learning: An authentic teaching strategy to deliver a standards-driven curriculum. *Journal of Experiential Education*, 30(1), 36–53. https://doi.org/10.1177/105382590703000104

Squires, D., Huitt, W., & Segars, J. (1983). Effective schools and classrooms. Alexandria, VA: Association for Supervisor and Curricular Development.

STEM Education Act, 114th Congress § H.R.1020 (2015).

Stockard, J., Wood, T., Coughlin, C., & Rasplica Khoury, C. (2018). The effectiveness of direct instruction curricula: A meta-analysis of a half century of research. *Review of Educational Research*, 88(4), 479–507. https://doi.org/10.3102/0034654317751919

Thomas, R. (2005). *High-stakes testing coping with collateral damage*. L. Erlbaum Associates. https://ebookcentral.proquest.com/lib/clemson/detail.action?docID=227534&pq-origsite=primo

Trilling, B., & Fadel, C. (2009). *21st-century skills: learning for life in our times. In 21st century skills* (1st ed.).

United States National Commission on Excellence in Education. (1983*). A nation at risk: the imperative for educational reform*. Washington, D.C. The National Commission on Excellence in Education. https://www2.ed.gov/pubs/NatAtRisk/risk.html

Van Sickle, M. L., Swanson, J. D., & Ridenhour, J. (2019). *Toward a definition of a gifted and talented teacher: Case analysis. In Identifying, describing, and developing teachers who are gifted and talented* (pp. 254-274). IGI Global.

Verger, A., & Parcerisa, L. (2017). Accountability and education in the post-2015 scenario: International trends, enactment dynamics, and socio-educational effects.

Verger, A., & Parcerisa, L. (2018). Test-based accountability and the rise of regulatory governance in education: A review of global drivers. *Education governance and social theory: Interdisciplinary approaches to research*, 139-158.

Verger, A., Parcerisa, L., & Fontdevila, C. (2019). The growth and spread of large-scale assessments and test-based accountabilities: A political sociology of global education reforms. Educational Review, 71(1), 5-30.Wiley.Vaughn, M. (2013). Examining Teacher Agency: Why Did Les Leave the Building? *The New Educator*, 9(2), 119–134. https://doi.org/10.1080/1547688X.2013.778763

Voelkel Jr, R. H., & Chrispeels, J. H. (2017). Understanding the link between professional learning communities and teacher collective efficacy. *School effectiveness and school improvement*, 28(4), 505-526.

Vygotsky, L. S. (1978). *Mind in society: The development of higher mental processes* (E. Rice, Ed. & Trans.).

Wagner, T. (2014). The global achievement gap: Why even our best schools don't teach the new survival skills our children need—And what we can do about it. In *The Global Achievement Gap*. Basic Books.

Weegar, M. A., & Pacis, D. (2012, January). A comparison of two theories of learning--behaviorism and constructivism as applied to face-to-face and online learning. In *Proceedings e-leader conference*, Manila.

Witt, C., & Ulmer, J. (2010). The impact of inquiry-based learning on the academic achievement of middle school students. In *Proceeding of the 29th Annual Western*

Region AAAE Research Conference (Vol. 269, p. 282). https://www.researchgate.net/profile/Jonathan-Ulmer/publication/268347956_

Wurdinger, S. (2012). *Time for action: Stop teaching to the test and start teaching skills. In time for action*. Rowman & Littlefield Education

Yager, R. (2000). The Constructivist Learning Model. *The Science Teacher (National Science Teachers Association)*, 67(1), 44–45.

Yew, E., & Goh, K. (2016). Problem-Based Learning: An Overview of its Process and Impact on Learning. *Health Professions Education*, 2(2), 75–79. https://doi.org/10.1016/j.hpe.2016.01.004

Yilmaz, K. (2011). The cognitive perspective on learning: Its theoretical underpinnings and implications for classroom practices. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 84(5), 204-212.

Yuan, K., & Le, V. (2012). *Estimating the percentage of students who were tested on cognitively demanding items through the state achievement tests*. Santa Monica, CA: RAND Corporation

.Zhang, L. (2016). Is inquiry-based science teaching worth the effort? Some thoughts worth considering. *Science & Education*, 25, 897-915.