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Principals' Definition and Identification Of Critical Thinking In Teacher Practices

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PRINCIPALS' DEFINITION AND IDENTIFICATION OF CRITICAL THINKING IN TEACHER PRACTICES

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ABSTRACT

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Principals are teacher evaluators and, therefore, need a clear definition and identification of critical thinking in teacher practices to increase their impact on teacher effectiveness and student critical thinking outcomes. Beyond teacher evaluations, principals are responsible for supporting and developing teachers in their instructional practices (Davis et al., 2005) and for enhancing teachers' pedagogical skills (Marzano et al., 2011). This instrumental case study explored how 12 principals, who use the Colorado State Model Evaluation System (CSMES) to evaluate critical thinking teacher practices, define critical thinking, and identify critical thinking utilized in teacher practices. Participants were purposefully selected from this Colorado district due to the district strategic action plan that focuses on the traits of a graduate that includes being a critical thinker as one of the top five competencies. Two research questions guided this inquiry:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

The data collection process included semi-structured interviews that ranged from 15 minutes to 1 hour.

Overall, three themes emerged from Research Question Q1. Theme one was critical thinking has many interpretations. Next, theme two was critical thinking includes a wide variety of skills. Lastly, theme three was critical thinking is embedded in education programs.

Two themes emerged from Research Question Q2. Theme one was principals identify critical thinking through student engagement; in other words, the level at which students are engaged in student-talk, academic discourse, and critical thinking processes was key to the identification of critical thinking in teacher practices. The second theme in relation to Research Question Q2 was principals identify critical thinking through the teacher's intentional instructional design of learning. An expanded discussion of the findings, recommendations for practice, policy, and recommendations for further research offer insight unique to this inquiry.

Keywords: critical thinking, school leadership, principals, instructional leadership, teacher practices

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CHAPTER I

INTRODUCTION

Critical thinking stands as an indispensable component of education (Hattie, 2012; Ndofirepi, 2014; Price, 2017). According to Dewey (1910/1933), intellectually educated individuals are able to determine the difference between factual information and beliefs, draw clearly developed open-minded conclusions, and ask critical questions. Elder and Paul (2009) explained that critical thinking is the process of taking one's thinking and/or the thinking of others apart by analyzing the question at issue, implications and consequences, information, inferences, assumptions, purpose or goal, points of view, and concepts inherent in thinking while evaluating each part of thinking with a standard of clarity, depth, accuracy, breadth, precision, and/or logic. These critical thinking processes are utilized to improve the quality of thinking (Elder & Paul, 2009).

This chapter focuses on the importance of teaching critical thinking. The chapter then highlights the evolution of policy that emphasizes teaching and evaluating critical thinking and the role that teachers and principals play in improving instruction. Subsequently, the need for research on principals' conceptions of critical thinking within the teacher evaluation system is discussed. This chapter concludes with an overview of a qualitative study that explored principals' definitions of critical thinking and how they identified the use of critical thinking in teacher practices in the general education classroom.

Importance of Teaching Critical Thinking

The need for critical thinking in schools is essential in the 21st century (Darling-Hammond & Oakes, 2019; Ennis, 2011; Organization for Economic Cooperation and Development, 2017; Paul, 2012a). In 2009, former Secretary of Education Arne Duncan (as cited in U.S. Department of Education [USDOE], 2010) addressed the vision of United States educational reform to the United Nations Educational, Scientific, and Cultural Organization: "Economic interdependence brings new global challenges and educational demands. The United States cannot, acting by itself, dramatically reduce poverty and disease or develop sustainable sources of energy" (para. 20–21). Duncan further elaborated, "America alone cannot combat terrorism or curb climate change. To succeed, we must collaborate with other countries. Those new partnerships require American students to develop better critical thinking abilities" (para. 21–22). Educators have been charged with teaching critical thinking for the past decade (USDOE, 2010); however, recent poll and survey results have shown that although critical thinking is sought after by college students and employers, it is not a pervasive skill set in education or the workplace (Belkin, 2015; Deloitte Global, 2018; Hart Research Associates, 2018; MindEdge, 2019).

Polls conducted by Deloitte Global (2018), and surveys conducted by MindEdge (2019) with current college students and recent college graduates indicated that students have self-reported that they are lacking critical thinking skills. According to the Collegiate Learning Assessment Plus poll results from 2013 and 2014, almost half of college graduates were lacking complex reasoning skills associated with critical thinking (Belkin, 2015). A survey of business owners from 2018 revealed that the eight top-tier learning priorities valued most by hiring executives included critical thinking (Hart Research Associates, 2018). Brown (2016) noted that

from 1980 to 2015 employment in jobs that "require higher levels of analytical skills, such as critical thinking," grew 77% (p. xx). Students entering the workforce with the ability to think critically is highly desirable, yet students with developed critical thinking skills are a scarcity (Deloitte Global, 2018; Hart Research Associates, 2018; MindEdge, 2019).

Critical thinking is in high global demand (Darling-Hammond et al., 2017; National Commission on Teaching and America's Future, 1996). Research shows that students with critical thinking skills will be prepared to address future global challenges, economic competitiveness, and diverse cultural conditions (Benjamin et al., 2015; USDOE, 2012). However, numerous scholars have suggested that current educational practices do not promote fair-minded critical thinking (Arum & Roksa, 2011; Gormley, 2017). The current global educational climate presses for improved critical thinking outcomes; therefore, educational leadership and national reform efforts are charged with securing quality systems and structures that foster critical thinking in the educational system (Partnership for 21st Century Skills [P21], 2008).

The United States has a long history of educational reform (Mondale & Patton, 2001). The mission of the USDOE (1980) is "to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access" (para. 1). Forty years later, this remains true for today: Student achievement remains a high priority.

United States Educational Reform Policy and Critical Thinking

Public education in the United States is comprised of a long history of educational reformers striving for a better education system (Mondale & Patton, 2001). For more than 100 years, critical thinking has been closely examined (Streib, 1992) as an integral component to learning and student success in United States schools by some of the following thinkers: John

Dewey, Edward Glaser, David Russell, Robert Ennis, John McPeck, Harvey Siegel, and most recently in the early 1980s Richard Paul (Darling-Hammond & Oakes, 2019; Hitchcock & Jenicek, 2011; P21, n.d.). Critical thinking, however, has not been historically identified as a component within education reform policy until it emerged in two of the components of the Race to the Top grant initiative: the Common Core Standards Initiative and teacher evaluation criteria and practices (USDOE, 2009, 2017).

Race to the Top

In late 2009, the USDOE (2017) released the Race to the Top criteria for states wishing to apply for federal grant funds. The purpose of Race to the Top was to advance educational reform efforts in four areas (USDOE, 2017): (a) teacher and principal incentives to stay in the field, (b) adoption of standards and assessments designed to prepare students for post-secondary success and to provide the necessary skills to compete in the global economy, (c) turnaround improvements for schools with low performance, and (d) the creation of data systems to measure student growth. The four reform areas were identified as a comprehensive approach to educational transformation in the United States (USDOE, 2017).

Common Core State Standards Initiative: A National Reform Perspective

One criterion for states to receive Race to the Top federal grant monies was to adopt the Common Core State Standards (CCSS) as a comprehensive approach to ensuring students were prepared with the essential skills, and in particular, critical thinking, for positive post-secondary outcomes (CCSS Initiative, 2017). The development of the standards was influenced by a speech in March of 2009, where President Obama addressed the nation's governors and chief state school officers, and asked them to "develop standards and assessments that don't simply measure

whether students can fill in a bubble on a test, but whether they possess 21st century skills like problem-solving and critical thinking and entrepreneurship and creativity" (Gorman, 2010, para. 62). In 2009, the CCSS were established in partnership with 48 states and other entities belonging to the National Governors Association Center for Best Practices and the Council of Chief State School Officers.

According to Duncan (USDOE, 2010), United States education practices and policies also deferred to the results of the Programme for International Student Assessment for direction in promoting globally competitive learning. The P21 (2008) asserted that the ability to think critically, along with other 21st century skills as necessary learning dispositions, demanded a targeted focus in educational policy. Multiple organizations have contributed to the development of 21st century skills, like that of critical thinking, such as North Central Regional Educational Laboratory and the Metri Group (2003), the International Society for Technology in Engineering (2007), the National Research Council (2008), the National Science Teachers Association (NSTA, 2016), the Standards for the 21st Century Learner of the American Association of School Librarians (2007), and the P21 (2015).

The CCSS were introduced as standards that focused on "developing the critical-thinking, problem-solving, and analytical skills students will need to be successful" (CCSS Initiative, 2017, para. 2). Achievement in literacy and mathematics remained a high priority, but the integration of other skills such as critical thinking was named as an integral component of the CCSS (CCSS Initiative, 2017; Gormley, 2017). Student mastery of the CCSS standards would ensure that students would be college and career ready by high school graduation and therefore, able to compete in a global economy (CCSS Initiative, 2017; USDOE, 2017).

Common Core State Standards Initiative: The Colorado Reform Model

A contender and receiver of Race to the Top grant monies, Colorado adopted the CCSS in 2010 (Colorado Department of Education [CDE], 2020b). The CCSS adoption provided Colorado with shared standards that better prepared students with 21st century skills (CDE, 2020b). The 21st century skills identified by the CDE were to be information literate, to collaborate, to maintain self-direction, to initiate inventive problem solving, and to be a critical thinker (CDE, 2020c, p. 1). The CDE (2020c) described the importance of critical thinking as vital and "in order for students to be successful and powerful readers, writers, and communicators, they must incorporate critical thinking and reasoning skills" (p. 1). To be critical thinkers, students need to "argue a point, justify reasoning, evaluate for a purpose, infer to predict and draw conclusions, problem-solve, and understand and use logic to inform critical thinking" (p. 1). Colorado has maintained a focus on academic standards and essential 21st century skills, including critical thinking, in the recent standards adoption since the Race to the Top grant initiative (CDE, 2020a).

Changes to Teacher Evaluation: A National Reform Perspective

Per the USDOE (2009), each state competing for the Race to the Top grant monies was also charged with creating a teacher effectiveness evaluation system. Other components of teacher evaluation models reflected in the Race to the Top grant criteria (USDOE, 2009) included implementing data systems that track student growth to assist teachers and principals in supporting student achievement and outcomes (USDOE, 2009). The evaluation process included

teachers be observed in multiple teaching areas with ratings on observations, feedback, and measures of student learning and growth (Darling-Hammond, 2013).

Teacher Evaluation: The Colorado Reform Model

The Great Teachers and Leaders Act (Senate Bill 10-191) passed in Colorado in 2010 (CDE, 2017b, 2017c). Components of the bill identified providing meaningful feedback, implementing annual educator effectiveness evaluations informed by the educator's professional practices and measures of student learning, hiring practices that are mutual, and identifying non-probationary status contingent on educator performance and expertise (CDE, 2017b, 2017c). The "strongest school-based factors impacting student achievement" in the educator effectiveness process, according to The Great Teachers and Leaders Act, are school leadership and classroom instruction (CDE, 2017a, p. 1).

Colorado Reform of Teacher Evaluation: Quality Teaching Standards

Created and adopted in 2009 and revised and adopted in the spring of 2019, the quality teaching standards were the guiding framework for professional practices on the Colorado teacher evaluation rubric (CDE, 2017e, 2020a; Education First, 2015). Quality Standard III stated, "Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students" (CDE, 2019a, p. 5). Element D specifically addressed teachers' critical thinking teaching practices: "Teachers establish and communicate high expectations and use processes to support the development of critical-thinking" (CDE, 2019a, p. 6). Table 1 lists the descriptors and proficiency levels for the Colorado teacher evaluation rubric, quality standard III, Element D (CDE, 2019b).

Table 1

2019 Rubric for Evaluating Colorado Teachers, Quality Standard III, Element D, Critical Thinking

The teacher	And the teacher	And the teacher	And students	And students
Establishes expectations at a level that challenges students	Uses questioning strategies to develop students' critical thinking and problem-solving skills	Models critical thinking and problem-solving skills	Use questioning strategies to develop and test innovative ideas	Construct logical arguments
Plans lessons that incorporate critical thinking and problem-solving skills	Uses wait time to encourage student responses		Use evidence to justify conclusions and synthesize knowledge	Use concepts to solve problems

Note. The Colorado teacher evaluation rubric is used by principals to support teaching and learning outcomes. Quality Standard III, Element D is specifically designed to assist principals in the evaluation of teachers' professional practices and student progression as critical thinkers (Colorado Department of Education [CDE], 2019b). Adapted from the *Rubric for Evaluating Colorado Teachers* by CDE, 2019b (https://www.cde.state.co.us/educatoreffectiveness/revised-teacher-rubric).

Roles That Teachers and Principals Play in Improving Instruction

Teachers and principals are integral to improving teaching and learning (Leithwood et al., 2004; Tucker & Stronge, 2005) and play important roles in the implementation of United States educational policies, reforms, standards initiatives in schools and classrooms, and increasing student achievement. According to Darling-Hammond (1997), reform in schools can be effective

or ineffective based on the "knowledge, skills and commitments of those in schools" (p. 15). Greenstein (2012) elaborated on reform, stating that "schools that incorporate the best strategies for teaching and learning, and are balanced in meeting the academic, developmental, and psychosocial needs of today's students" show greater potential for success (p. 209). Together, teachers and principals are responsible for supporting students in standards acquisition and overall learning (Leithwood et al., 2004; Rickabaugh, 2016).

A primary focus in schools and classrooms is increased student achievement and student mastery of the standards, and "teachers' pedagogical content knowledge is central to teacher effectiveness" (Leithwood et al., 2004, p. 11). Leithwood et al. (2004) defined pedagogical content knowledge as the "knowledge about how to teach particular subject matter content" (p. 11). Teachers' use of pedagogical content knowledge is integral for developing students as critical thinkers (Dewey, 1910/1933; Hattie, 2012; Paul, 1992). Likewise, teachers' pedagogical knowledge is key for cultivating teacher effectiveness (Leithwood et al., 2004). When teachers effectively utilize pedagogical content knowledge, students achieve mastery of the standards, which includes the development of analytical, problem-solving, critical thinking skills, and overall increased student achievement (CCSS Initiative, 2017; Leithwood et al., 2004).

The role of the principal as an instructional leader is key in supporting teachers focus on student achievement and in supporting teacher's effectiveness and growth (Education First, 2015; Leithwood et al., 2004; Robinson, 2007). Instructional leadership, according to Leithwood et al. (2004), "encourages a focus on improving the classroom practices of teachers" (p. 4). To support teachers' instructional practices, principals commonly utilize observations, walk-throughs, peer observations to model effective instruction, feedback cycles, professional development, and data collection (Darling-Hammond, 2013; Peterson & Peterson, 2006). Recent

literature (Darling-Hammond, 2013; Kraft & Gilmour, 2016) on content knowledge and instructional leadership showed that principals felt that they needed more "sophisticated knowledge of content areas, in order to intelligently guide teachers toward honing their instructional skills" (Plessis, 2013, p. 89). This reflection led to a recommendation that to improve instruction, principals needed to "develop content knowledge and facilitate teacher content knowledge" as instructional leaders (Plessis, 2013, p. 90). The role of instructional leadership is important in increasing student achievement and leveraging high-quality teacher practices (Leithwood et al., 2004; Robinson et al., 2008) while playing a significant role in the teacher evaluation process (Kraft & Gilmour, 2016; McEwan, 2003).

To aid teachers in the continuous improvement of their professional practices, the literature suggested that principals provide instructional guidance (Davis et al., 2005; Kraft & Gilmour, 2016). Feedback is effective when the principal as the instructional leader can address the teachers' need to "develop both their content knowledge and their pedagogical content knowledge" (Kraft & Gilmour, 2016, p. 734). Reeves (2010) suggested that effective teacher feedback positively influences the quality of instruction, which impacts student achievement. Cohen and Goldhaber (2016) contended that "greater conceptual clarity around the features of instructional quality" (p. 384) are also important in the teacher evaluation process. In the teacher evaluation process, the research found that the principal's role is instructional leader aimed at positive student achievement outcomes (Davis et al., 2005; Kraft & Gilmour, 2016).

In the state of Colorado, school district leaders and principals in instructional leadership roles utilized the Colorado State Model Evaluation System (CSMES) teacher evaluation model or a similar teacher evaluation model that is state approved to evaluate teachers in multiple areas, one of which is critical thinking (CDE, 2017b, 2019a). Within the CSMES, professional

practices included four areas referred to as Quality Standards and Elements (CDE, 2017b). One of the areas principals rated teachers on was Quality Standard III, Element D, which stated, "Teachers establish and communicate high expectations and use processes to support the development of critical-thinking" (CDE, 2019a, p. 6). The evaluation of teacher practices, specific to critical thinking, were centralized in Quality Standard III, Element D, and utilized a gradual progression of critical thinking teaching practices to support student critical thinking outcomes (CDE, 2019b).

Statement of the Problem

The ability to think critically is a key competency of 21st century education, extending its mastery alongside reading, writing, and math (Benjamin et al., 2015; Darling-Hammond, 1997; Heick, 2019; Price, 2017; Wagner, 2014). Business leaders and students entering the workforce have contended that the ability to think critically is an essential competency of current workforce skills and, therefore, a priority in education (Deloitte Global, 2018; Ennis, 2011; Hart Research Associates, 2018; MindEdge, 2019). Although critical thinking has educational merit (Paul, 2012c), educators are faced with many demands that compete for prioritization in classroom instruction and learning (Darling-Hammond & Oakes, 2019; Heick, 2019). Beyer (2008) stressed that within the kindergarten–12 (K–12) education system, teachers' teaching of critical thinking is a fundamental goal of classroom instruction; however, a number of scholars have suggested that teachers are generally ill-equipped to teach, assess, and evaluate critical thinking (Beyer, 1987; Darling-Hammond & Oakes, 2019; Gormley, 2017; Lipman, 1988; National Commission on Teaching and America's Future, 1996; P21, 2008; Paul & Elder, 2001).

Colorado has incorporated Quality Standard III, Element D, within the teacher effectiveness rubric to assess teacher effectiveness in developing student critical thinking skills

in the classroom (CDE, 2019b). The need for teachers to foster and develop critical thinking skills in their classrooms is supported in the literature (Bottery, 2016; Gormley, 2017; Hattie, 2012; Organization for Economic Cooperation and Development, 2017; Paul, 2012c; Price, 2017; Rotherham & Willingham, 2009). Principals play a key role in supporting teachers' improvement and evaluation of their instructional practices (Education First, 2015; Leithwood et al., 2004; Robinson, 2007; Supovitz & Poglinco, 2001) to promote critical thinking, yet principals are under prepared to evaluate critical thinking (Baker, 2010). Wagner (2012) stated that "many school administrators have absolutely no idea what kind of instruction is required to produce students who can think critically and creatively, communicate effectively, and collaborate versus merely score well on a test" (p. xi). Wagner (2012) emphasized the importance of evaluator training in regard to the evaluation of instructional practices that promote critical thinking. To evaluate teachers in the state of Colorado, teacher evaluators, which can include principals, are trained on the CSMES tool. Although Colorado law stated that any person trained in teacher evaluation can evaluate teachers, for purposes of this study, I used the term principals to indicate the person responsible for evaluating teachers. The training is specific to how to use the CSMES tool rather than training on skills needed to evaluate each quality standard and element. Specifically, principals evaluate teachers on a continuum of teacher and student practices related to critical thinking; however, empirical studies are limited in regard to principals' definitions and praxis of critical thinking used to evaluate teacher practices in the general education classroom (Bergin et al., 2017).

The research is rich in identifying general effective teaching strategies and effective leadership practices. Furthermore, literature on teacher evaluation techniques has focused on classroom observations and instructional feedback (Kraft & Gilmour, 2016; Reeves, 2010;

Robinson et al., 2008). Even more so, literature showed that the role of the principal as an instructional leader in the teacher evaluation process of critical thinking is vital to student learning, teacher instruction, school leadership, and education systems (Arum & Roksa, 2011; Heick, 2019; Wagner, 2014). However, research on how principals evaluate teachers' effectiveness in teaching critical thinking is limited (Bergin et al., 2017). Studying principals' definitions and conceptions of critical thinking in the classroom from a specific school district will help to give an in-depth understanding of the identification and evaluation of critical thinking on the Colorado CSMES tool.

Purpose of the Study

In the CSMES, the principal is responsible for rating teachers' professional practices in all evaluation areas (CDE, 2017d). During the evaluation process, the principal can take an instructional leadership role by providing feedback on quality standards to teachers and their professional practices (CDE, 2017b) and assisting in developing teacher professional practices (Davis et al., 2005; Kraft & Gilmour, 2016; McEwan, 2003). Though evaluation plays a critical role in teacher effectiveness (Education First, 2015), the literature is still limited on how principals define and identify the use of critical thinking in teacher practices in the classroom (Gormley, 2017; Wagner, 2012). The purpose of this qualitative study was to gain an in-depth understanding of how Colorado principals, from a specific school district, conducting teacher evaluations define critical thinking and identify critical thinking in teacher practices.

Research Questions

The research questions guiding this research study are as follows:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

To further explore Colorado principals' conception of critical thinking, a subsequent question follows:

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

Nature of the Study

This qualitative inquiry is well suited for case study methodology. Grounded in a constructivism epistemology, this intrinsic case study was designed to better understand the phenomena (Merriam, 1998) of critical thinking from participants in their natural setting. Selective sampling and specific criteria relevant to critical thinking at the state and district level guided the selection of participants invited to participate in this inquiry. The participants were elementary principals bound to a specific school district (Creswell, 2007).

The use of interviews, field notes, and the retrieval of artifacts and documents assisted in understanding the phenomena through a "rich" and "thick" description (Merriam, 1998, p. 29). The numerous methods of data collection contributed to the trustworthiness and triangulation of the data (Dimmock & Lam, 2012). To analyze the data, open, axial, and selective coding were applied as processes to identify categories and the development of themes. Constant comparison analysis was utilized to look for similarities and differences in the coding process (Charmaz, 2014; Glaser & Strauss, 1967).

Definition of Terms

The following definitions are used frequently throughout the inquiry:

Colorado State Model Evaluation System: The CSMES is a CDE approved teacher evaluation model (CDE, 2017a). The teacher evaluation model has multiple components to determine a teacher's effectiveness, one of which is professional practices (CDE, 2017a).

Critical thinking: The process of analyzing and evaluating thinking in order to improve the quality of one's thinking (Elder & Paul, 2009). The act of critical thinking to improve the quality of thinking encompasses analyzing the purpose, information, concepts, inferences, assumptions, implications or consequences, question at issue, and points of view inherent in thinking, and then to assess those components with intellectual standards of clarity, breadth, accuracy, logical, precision, depth, and fairness (Elder & Paul, 2009).

Evaluation: The process of providing a consistent judgment of a teacher's performance by an evaluator (Danielson & McGreal, 2000).

Principal: The person who is responsible for overseeing teacher professional practices (CDE, 2017a). In Colorado, an educator that has an evaluator role is required to hold a principal or administrator license and/or is a person that has received the annual required state evaluator training (CDE, 2017e).

Conclusion

"*Critical thinking* has long been a buzz phrase" in education (Wagner, 2014, p. 44, emphasis in original), yet critical thinking as a fundamental component and educational outcome clearly stated in student standards and assessments (CCSS Initiative, 2017) and in teacher evaluation policies is relatively new (CDE, 2019c; P21, 2008; USDOE, 2010). Despite recent reform efforts, many have argued that the educational system has not yet cultivated a clear definition of critical thinking and a clear identification of teacher practices that support students thinking critically in classrooms (Bottery, 2016; Paul, 2012a; Wagner, 2014; Wagner et al., 2006). The purpose of this dissertation was to examine the advancement of critical thinking in education and, particularly, how principals from a specific school district defined critical

thinking and how they see it used in teacher practices in the general education classroom. In chapter II the literature will be reviewed.

CHAPTER II

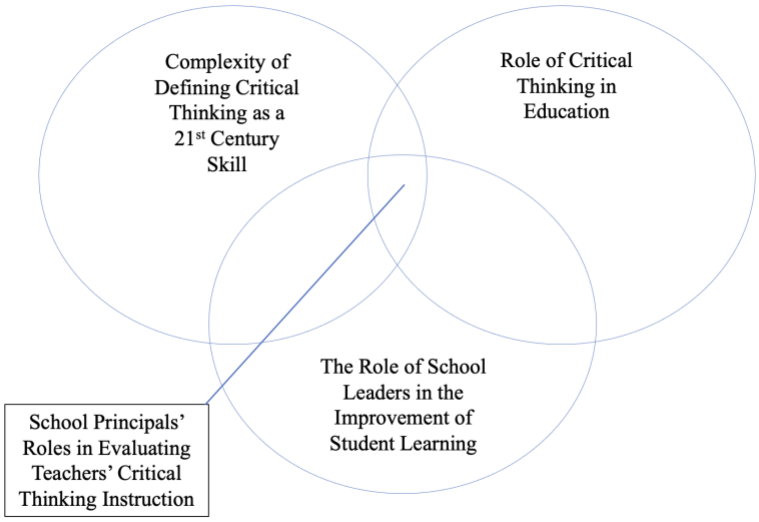
LITERATURE REVIEW

Critical thinking has become a substantial component of a quality education for not just a few elites but for all students (Reimers & Chung, 2016). As a focal skill of 21st century education, critical thinking is integral to educators, teachers, and principals in development of policy and practices in the classroom (Paul, 2012d). These policies and practices are intended to support and foster critical thinking as an instructional strategy and to improve outcomes for student competencies. To support the implementation of effective instructional practices and to achieve positive student critical thinking outcomes, principal leaders have taken an active instructional leadership role as teacher evaluators (Robinson, 2007; Tucker & Stronge, 2005).

This literature review is focused on critical thinking and the role of teacher evaluation that determines teacher effectiveness. This chapter includes background on 21st century learning skills in addition to three components highlighted in the three circles in Figure 1: (a) the complexity in defining critical thinking as a 21st century learning skill in education, (b) the role of critical thinking in education, and (c) the role of school leaders in the improvement of student learning. These components overlap in Figure 1 to represent the independent nature of each topic and the interconnectedness of the topics that inform the discussion on school principals' roles in evaluating teachers' critical thinking instruction and the advancement of further research inquiry.

Figure 1

Literature Review Overview



Twenty-First Century Learning Skills

Once rooted in instructional practices focused on the teachings of factual information (Lipman, 1988), traditional classrooms have shifted in the last decade to a more robust learning environment embedded with a range of 21st century skills (Dede, 2007; Levy & Murnane, 2006; Trilling & Fadel, 2009; United States Department of Education [USDOE], 2010). These 21st century skills are not necessarily new (National Science Teachers Association [NSTA], 2016); rather, they have been given new significance, meaning, and emphasis in education, businesses, and the ever-changing workplace. Such skills rank higher than any other skills sought after in competitive business and the workplace (Hart Research Associates, 2018) and have become fundamental to the United States' ability to remain competitive in the global economic arena. Therefore, kindergarten–12 (K–12) education systems are adapting to the demand for 21st century skills (Partnership for 21st Century Skills [P21], 2008; USDOE, 2010).

Collaboration, Creativity, Communication, and Critical Thinking

Researchers in the field of education, business leaders, and policy makers have partnered to contribute to the range of important skills for the 21st century workplace (P21, 2015). Further, organizations such as the National Research Council (2008), the NSTA (2016), and the P21 (2015) have identified specific 21st century skills that support program-specific goals and outcomes for the future workforce. Combined, the following 21st century workplace skills have been referred to as communication, collaboration, creativity, and critical thinking (4cs; National Research Council, 2008; NSTA, 2016; P21, 2015).

The 4cs were aimed to enhance work readiness skills (NSTA, 2016; P21, 2015), and the 4cs were also embedded into policy and practices and academic standards (North Central Regional Educational Laboratory and the Metri Group, 2003). North Central Regional Educational Laboratory and the Metri Group (2003) developed policy and educational practices referred to as *enGauge 21st Century Skills: Literacy in the Digital Age*; furthermore, the North Central Regional Educational Laboratory and the Metri Group also developed explicit connections between the 4cs and academic standards. This integration helped to define the purpose and intention of using such skills, like that of critical thinking, to authentically engage students in intellectual work (North Central Regional Educational Laboratory and the Metri Group, 2003). Additionally, the focus on the 4cs had become an integral component of the P21 (2015) framework for 21st century skills. The 4cs, as defined by P21 (2015), were intended to address innovation, and learning skills throughout all contents and contexts of learning.

Significance of Critical Thinking

The 21st century skills of communication, collaboration, and creativity are important in the ever-changing literate world (P21, 2015), yet one skill is most essential: critical thinking (Paul, 2012d). Critical thinking has been deemed a fundamental 21st century skill needed in our schools today (Facione & Gittens, 2016; Halpern, 2003; Paul, 2012d). Although the P21 (2015) framework identified critical thinking as one of the 4cs for 21st century learning, further inquiry is needed to clearly understand the dispositions and definitions of critical thinking and how they are applied to learning (Costa, 2008; Ennis, 1996; Facione & Gittens, 2016; Halpern, 2003; Paul & Elder, 2006; Ritchhart, 2002).

The Complexity of Defining Critical Thinking as a Twenty-First Century Skill in Education

Past and present thinkers from philosophy and education have offered diverse definitions and points of view on critical thinking (Abrami et al., 2015; Daniel & Auriac, 2011; Paul, 2012a; Ritchhart, 2002). The varying definitions have derived from each individual's conception of what it means to think critically (P21, n.d.; Paul, 2012a; Ritchhart, 2002). Lipman (1988) stated that if schools are going to continue to develop the broad concept of critical thinking and embed it into student learning and outcomes, then defining the term "critical thinking" is a necessity. To better understand the progression of the conception of critical thinking and the complexity in defining critical thinking, the following chronological sections examine definitions of critical thinking and critical thinking elements from enduring leading 20th and 21st century thinkers: Dewey (1910/1933), Glaser (1941), Paul (1968, 1992), Lipman (1988), and Ennis (1996).

Dewey's Definition of Critical Thinking

Dewey's (1910/1933) work on critical thinking focused on how to extrapolate one's thinking, the need to train one's thinking, and the role of the teacher and the student in learning. "The essence of critical thinking is suspended judgment; and the essence of this suspense is inquiry to determine the nature of the problem before proceeding to attempts at its solution" (Dewey, 1910/1933, p. 60). One component of Dewey's analysis of thought focused on understanding and recognizing that humans are thinking creatures, regardless of the quality of our thinking. Additionally, an individual's belief systems and observations influence their thought process (Dewey, 1910/1933). In order to have reflective thought, Dewey contended that a person must be persistent in burrowing into the origin of knowledge and/or beliefs to fully exhibit reflective thought. This process of reflection, as stated by Dewey, is an individual's regulation of thought that makes the process of making an inference reflective.

Dewey (1910/1933) also illustrated that the intricacy of the mind lacks discipline and succumbs to influences such as superstitions and social influences. These influences can either be accepted or rejected in thinking (Dewey, 1910/1933). With diligent training of the mind, formerly un-assessed thinking can transform to include analysis of thought (Dewey, 1910/1933). In the words of Dewey, "A being who could not think without training could never be trained to think; one may have to learn to think ***well***, but not to ***think***" (p. 26, emphasis in original). Dewey's work illuminated the need to identify internal beliefs and external influences as obstacles to quality thinking. Dewey stressed the importance of assessed thinking as components of critical thinking.

Glaser's Definition of Critical Thinking

Glaser (1941) noted that the study of critical thinking was of significance, as there was a pressing need to educate the masses. In Glaser's definition of critical thinking, there are three components to consider: "(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences, (2) knowledge of the methods of logical inquiry and reasoning, and (3) some skill in applying those methods" (pp. 5–6). Like that of Dewey (1910/1933), who noted that belief systems influence one's ability to think critically, Glaser drew out one's experiences as a fundamental, defining component of critical thinking. Furthermore, Glaser emphasized the process of providing reasoning and evidence for one's beliefs.

Paul's Definition of Critical Thinking

Paul (1968) developed concepts connected to critical thinking in the late 1960s and into the early 1980s, but Paul (1992) developed the concept of "strong–sense" (p. 10) critical thinking to complement working definitions of critical thinking. Paul (2012b) explained critical thinking as the following:

> Critical thinking is thinking about your thinking while you're thinking in order to make your thinking better. Two things are crucial: *1)* critical thinking is not just thinking, but thinking which entails self-improvement and *2)* this improvement comes from the skill in using standards by which one appropriately assesses thinking. (p. 7, emphasis in original)

Paul (2012b) explained that critical thinking is the art and science of critiquing thinking, which is the act of objectively judging, analyzing, or evaluating something. Paul's (2012b) approach to analyze thinking is similar to Dewey's (1910/1933) assertion that analysis can improve thinking. Critical

thinkers practice disciplined thinking by applying critique or restraint to their thinking in order to improve their thinking, to redesign their thinking, or to remodel their line of reasoning (Paul, 2012b).

Lipman's Definition of Critical Thinking

Lipman (1988) thought it was important to know critical thinking's "defining features, its characteristic outcomes and the underlying conditions that make it possible" (p. 38). To determine the definition of critical thinking, Lipman evaluated and differentiated what was deemed critical thinking against that which was not truly critical thinking. For example, Lipman explored the notion of equating critical thinking with outcomes, stating:

> For example, if critical thinking is *thinking that results in decisions*, then selecting a ... doctor by picking a name at random out of a phone book would count as critical thinking. … *We must broaden the outcomes, identify the defining characteristics, and then show the ... connection between them*. (p. 38, emphasis in original)

Lipman acknowledged that numerous other qualities, such as conceptual learning, problem solving, and decision-making, are embedded in critical thought and outcomes of thinking, but these do not fully define critical thinking. Lipman weighed good judgments as "products of skillfully performed acts guided by or facilitated by appropriate instruments and procedures" (p. 39). Furthermore, Lipman stated that "critical thinking is *skillful, responsible thinking that facilitates good judgment because it (1) relies upon criteria, (2) is self-correcting, and (3) is sensitive to context*" (p. 39, emphasis in original). Thinking critically, according to Lipman, involved the use of criteria to assess thinking; hence, the use of the word "critical." Lipman included sound reasoning, standards, rules, and regulations (laws), requirements, norms, and assumptions, to name a few, as criteria for critical thinking. Additional critical thinking criteria included goals, ideals, credentials, procedures, and policies (Lipman, 1988).

If students are to think critically, Lipman (1988) indicated they must reason through their thinking using criteria and applying standards. Opinions are justified by reasoning that has been based on some type of criteria that, in turn, had a standard applied to it (Lipman, 1988). Lipman described this funneling phenomenon, which echoes Paul's work in the 1980s, as the narrowing down of the reasoning process in which humans base critical thinking. Lipman's definition of critical thinking applies elements of rationality to one's thinking, aims to improve it with criteria, and connects the work of learning to thinking.

Ennis' Definition of Critical Thinking

Ennis (1996) defined critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (p. 396). Ennis' (1996) commitment to refine the definition of critical thinking began in the 1960s, evolving through the 1980s, and was most recently refined in 1996. Ennis' (1996) definition includes three dispositions on how to think critically, also referred to as virtues of thinking: (a) strive to think through issues with the outcome of unbiased, quality thinking; (b) seek clarity when an individual expresses oneself through written and verbal communication; and (c) value "the worth and dignity of every person" and bring forth the need for critical thinkers to exhibit this disposition (p. xviii). Ennis' (1996) notion of critical thinking, which presents three dispositions to consider in the process of reasoning, embraces reflective thinking like Dewey (1910/1933), Glaser (1941), Lipman (1988), and Paul (1992).

Summary: Seminal Thinkers Contributions to the Definition of Critical Thinking

Standing on the shoulders of one another's discoveries in the field of critical thinking, these seminal thinkers have contributed to the fundamental development of the complexities in defining

critical thinking. Dewey (1910/1933) addressed the undisciplined analysis of thinking when defining critical thinking. Paul and Elder (2006) contended that critiquing one's thinking to improve thinking is associated with the act of critical thinking. During the process of reflecting and evaluating, criteria or standards are used to assess thinking; hence, the use of the word "critical" in "critical thinking" (Daniel & Auriac, 2011; Dewey, 1910/1933; Ennis, 1996; Lipman, 1988). Critical thinking as the act of recognizing a process to evaluate one's thinking (Glaser, 1941) includes inferences, assumptions, contextual information, social influences, belief systems, and biases, and their contribution to a quality thought process (Daniel & Auriac, 2011; Dewey, 1910/1933; Ennis, 1996; Lipman, 1988). Lipman (1988) built on Dewey's concept of suspending judgment to include the perspective that skillful, responsible thinking relies upon criteria, is able to self-correct, and is aware of the context. Lipman also indicated that thinking is authentic to the context. Although each seminal thinker has contributed to numerous shared elements of critical thought, one influential seminal thinker, Paul (1992), summarized the essential elements and features of critical thinking into a clear, robust expanded definition and framework of critical thinking (Nosich, 2012; Thayer-Bacon, 1991).

Expanded Paulian Definition and Framework of Critical Thinking

Paul, philosopher, and seminal thinker in the field and study of critical thinking, founder of the International Foundation for Critical Thinking, and former Chair of the National Council for Excellence in Critical Thinking worked in the field of philosophy, critical thinking, and education for over 40 years and was recognized as an international authority on critical thinking (Elder, 2010; Hitchcock & Jenicek, 2011; Paul & Philosophy Documentation Center, 2011; Streib, 1992). At the core of the Paulian theory, critical thinking embodies the process of analyzing thinking and evaluating thinking for the improvement of thinking (Paul & Elder, 2006). The process of analyzing thought and subjecting it to rigorous evaluation in order to judge

its quality, in other words, is the act of thinking critically. Paul (2012b) remarked that critical thinking is making "your thinking better: more clear, more accurate, or more defensible" (p. 643). Table 2 illustrates the eight elements of reasoning and the intellectual standards included in the Paulian framework and definition of critical thinking. Paul's (2012d) definition of critical thinking connects the parts of thinking, termed as elements of reasoning, and the intellectual standards designed to improve the quality of reasoning.

Table 2

Paulian Framework for Critical Thinking

Elements of reasoning	Intellectual standard
Point of view	Fairness, clarity, relevance, breadth
Purpose	Clarity, significance, fairness
Inferences	Clarity, logical
Assumptions	Clarity
Concepts	Clarity, relevance, depth, accuracy
Implications	Significance, logical, clarity
Questions at issue	Clarity, precision, significance, relevance, depth
Information	Clarity, relevance, accuracy

Note. Adapted from *The Thinker's Guide to Analytic Thinking* by R. Paul and L. Elder, 2012.

Elements of Reasoning

According to Paul and Elder (2006), the Paulian process to analyze thinking, regardless of the situation, involves thinking about the "point of view, assumptions, concepts, inferences, implications, question, information, and purpose" (p. 14). Paul and Nosich (2012) labeled these the elements of reasoning and noted that they can occur at any point in time; the "eight elements of reasoning work together to shape reasoning and provide a general logic to the use of reason" (p. 124). For instance, inferences are one of the eight elements of reasoning (Paul & Elder, 2001). When the mind takes in information and makes a conclusion, this is the process of making an inference (Paul & Elder, 2006). Paul and Elder (2006) further elaborated:

> For example, if you see a person sitting on a street corner wearing tattered clothing, with a worn bedroll beside him and a bottle wrapped in a brown paper bag in his hand, you might infer that he is a bum. This inference is based on the facts you perceive in the situation and on what you assume about those facts. (p. 61)

When coming to an inference, a thinker takes something that is believed to be known and they "figure out something else on the basis of it" (Paul & Elder, 2001, p. 56). When making an inference, it is important to remember that the inference made may or may not be justifiable (Paul & Elder, 2006). These elements of reasoning constitute a central focus in the process of analyzing thinking, but they are incomplete on their own because the intellectual standards are needed to determine how well a thinker is reasoning (Paul & Nosich, 2012).

Intellectual Standards

Paul and Nosich (2012) stressed the need to assess these elements of reason, which is accomplished with intellectual standards of reasoning. "The best thinkers don't believe any and everything they hear or read" (Elder & Paul, 2018, p. 11). Intellectual standards provide a way to

keep thinking on track and to help support what to believe and why (Elder & Paul, 2018). The core intellectual standards (Paul & Elder, 2001) are clarity, depth, precision, accuracy, fairness, breadth, completeness, relevance, significance, and accuracy. For example, applying the intellectual standards of logic and/or justifiability may help to determine if the inference made on the person on the street is logical and/or justifiable (Paul & Elder, 2006). The intellectual standards are a critical tool in assessing reasoning and play an integral role to the improvement of one's thinking (Paul & Elder, 2001).

Putting the Elements of Reasoning and Intellectual Standards Into Action

The Paulian definition (Paul & Elder, 2006) and theory of critical thinking encompasses how to take thinking apart and hold it to multiple criteria with an ultimate goal of improving thinking. The interplay between the elements of reasoning and intellectual standards is exemplified in Table 3 (Paul & Elder, 2006). This table focuses on inference and interpretation (element of reasoning) and pairs the intellectual standards that are most appropriate to assess an inference and/or interpretation, like clarity, logic, and justifiability. These intellectual standards are listed in the primary standards category.

According to Paul and Nosich (2012), the elements of thought provide a central focus for the evaluation of thinking, and when paired with intellectual standards for the purpose of assessing thinking, they can improve the reasoning process and thinking outcomes.

Table 3

Elements of Reasoning and Intellectual Standards

Inference and Interpretation		
All reasoning contains inferences from which we draw conclusions and give meaning to data and situations.		
Primary standards: (1) clarity, (2) logic, (3) justifiability, (4) profundity, (5) reasonability, (6) consistency		
Common problems: (1) unclear, (2) illogical, (3) unjustified, (4) superficial, (5) unreasonable, (6) contradictory		
Principle: Reasoning can be only as sound as the inferences it makes (or the conclusions it comes to).		
Skilled reasoners	Unskilled reasoners	Critical questions
Are clear about the inferences they are making and articulate their inferences clearly.	Are often unclear about the inferences they are making. Do not clearly articulate their inferences.	Am I clear about the inferences I am making? Have I clearly articulated my conclusions?

Note. Emphasis in original. Retrieved and adapted from *Critical Thinking: Learn the Tools the Best Thinkers Use* by R. Paul and L. Elder, 2006, p. 71. Copyright 2006 by Pearson.

Paulian Strong–Sense Critical Thinking Definition

The Paulian definition of critical thinking was later enhanced with the concept of fair-mindedness (Paul, 1992). Paul (1992) further developed the concept of "strong–sense" (p. 10) critical thinking to contend that critical thinking in itself does not necessitate fair-mindedness.

According to Paul (1992), when critical thinking is self-serving, or aimed at the needs of group interests while also excluding "other relevant persons and groups" (pp. 9–10), this is referred to as "sophistic or *weak-sense critical thinking*" (pp. 9–10, emphasis in original). Unlike many others in the field of critical thinking, Paul (1992) made the distinction that fair-minded, strong–sense, critical thinking is disciplined thinking that takes "into account the interests of diverse persons or groups" (pp. 9–10).

Furthermore, Paul and Elder (2006) elaborated on the definition of strong–sense critical thinking by identifying three traits of a strong–sense thinker. The act of taking your belief system and questioning it deeply is the first trait. The next trait is the "ability to reconstruct empathically and imaginatively the strongest versions of points of view and frameworks of thought opposed to one's own" (p. 332) Lastly, the act of reasoning "dialectically (multilogically) in such a way as to determine when one's own point of view is at its weakest and when an opposing point of view is at its strongest" (p. 332) is essential as a strong–sense critical thinker. Paul (1992) further explained that the concept of weak-sense critical thinking is "to develop one's critical thinking skills merely to the level of adequacy for social success" (p. 11). However, strong–sense critical thinking places fair-mindedness at the heart of all reasoning (Paul, 2012b).

Intellectual Traits

Using intellectual standards and elements of strong–sense reason to examine thought (Paul, 1992) can improve thinking and foster fair-minded intellectual traits such as "intellectual humility, intellectual autonomy, intellectual integrity, intellectual courage, intellectual empathy, intellectual perseverance, confidence in reason, and fair-mindedness" (Paul & Elder, 2006, p. 12). The intellectual traits are interdependent of one another (Paul & Elder, 2001) and are best developed in tangent with the other traits (Paul, 1992). On the intertwined complexities of the

intellectual traits, specifically intellectual humility, Paul and Elder (2001) said there is a need to "become aware of the limits of our knowledge" (p. 17). They explained, "We need the *intellectual courage* to face our own prejudices and ignorance. To discover our prejudices in turn, we often must *intellectually empathize* with and reason within points of view with which we fundamentally disagree" (p. 17, emphasis in original). Paul and Elder (2001) continued to make connections to each intellectual trait throughout the narrative; for example, attention to our intellectual perseverance to pursue areas of thinking that are challenging to what we believe is essential in order to "enter a point of view against which we are biased" (p. 17). This intellectual work requires a level of empathy, time, and effort. Paul and Elder (2001) noted the challenge of working on one intellectual trait in isolation because with intellectual discipline, the traits work hand in hand:

> We must feel obliged to hear them in their strongest form to ensure that we are not condemning them out of ignorance or bias on our part. At this point, we come full circle to where we began: the need for *intellectual humility*. (p. 17)

The process of utilizing the elements of thought to decipher what part of thinking to analyze, while selecting appropriate intellectual standards to assess thinking, can help in the practice and advancement of one's intellectual traits (Paul & Elder, 2001). Because strong–sense critical thinking is rooted in a disciplined mind, the outcome develops intellectual traits (Paul & Elder, 2001).

The Paulian theory embodies the process of analyzing and evaluating thinking for the improvement of thinking (Paul & Elder, 2006). These critical thinking processes support the notion that the improvement of thinking occurs when weak and less supported thinking is abandoned (Paul & Elder, 2006). Strong–sense critical thinking emphasizes fair-mindedness and

places it at the core of fundamental improvements in one's thinking (Paul, 2012b). The Paulian theory embraces a working definition of strong–sense critical thinking to apply to the role of critical thinking as an instructional model in education (Paul & Elder, 2006). Additionally, this robust definition and framework of critical thinking provides educators with tools to support critical thinking in the classroom (Fisher et al., 2016; Paul, 1992).

The Role of Critical Thinking in Education

There are a variety of approaches and taxonomies focused on cognition, cognitive processes, and higher order thinking in the field of education (e.g., Bloom et al., 1984; deBono, 1992). Simultaneously, multiple models and approaches specific to critical thinking also exist for educators to utilize in teaching students how to think critically (Abrami et al., 2015; Brookhart, 2010; Costa, 2008; Fahim & Eslamdoost, 2014). Just as the definition of critical thinking helps to frame and name what critical thinking is, the complexity in each model of critical thinking contributes to teachers and students identifying how they can engage in the process of quality reasoning (Brookhart, 2010; Paul, 2012c).

Leading scholars contend that critical thinkers exhibit behaviors and attributes that help them navigate their world (Costa, 2008; Ennis, 1996; Halpern, 1998, 2003; Paul & Elder, 2001; Ritchhart, 2002; Tishman et al., 1995). Additionally, leading scholars have brought forth numerous enduring elements inherent in critical thinking models (Costa, 2008; Edwards et al., 2016; Ennis, 1996; Paul & Elder, 2001; Ritchhart, 2002; Tishman et al., 1995). For the purpose of this review, the following seven critical thinking models have been deduced from the literature and support the discussion on enduring elements of critical thinking models from leading scholars: (a) Halpern's (1998, 2003) four–part model; (b) Tishman et al.'s (1995) culture and dispositions of thinking model; (c) Costa's (2008) 16 habits of mind model; (e) Ennis'

(1996) focus, reasons, inference, situation, clarity and overview model; (f) Ritchhart's (2002) culture of thinking and dispositions model; and (g) Paul and Elder's (2001) Paulian model of how to think critically. The following enduring elements of critical thinking models deduced from the literature review support teacher practices in developing students as critical thinkers by (a) establishing a culture of critical thinking, (b) fostering dispositions for critical thinking, (c) using thinking skills to practice critical thinking, and (d) promoting transfer of learning.

Enduring Element: Creating a Culture of Critical Thinking

Tishman et al. (1995) referred to culture of thinking as "integrated patterns of thought and behavior that bind together members of a group" (p. 2). The culture of thinking in a classroom focused on quality thinking is mindful of the language, habits, expectations, and values that are pervasive in all settings (Tishman et al., 1995). Setting up a learning environment that provides opportunities for thinking is fundamental to creating a culture of thinking (Abrami et al., 2015; Paul & Elder, 2001; Ritchhart, 2002; Tishman et al., 1995). Ritchhart (2002) named the role of the teacher as someone who explicitly models their thinking and the thinking of others. Teacher modeling is important in a critical thinking classroom; however, Hudgins and Edelman (1986) emphasized that students need to speak more, and teachers need to speak less.

The Role of the Socratic Method in the Learning Environment

The teacher creates a safe environment that encourages and embraces cognitive dissonance, an environment safe to ask questions, and a space for students to engage in critical thinking (McCall, 2011; Ritchhart, 2002). Swartz (2003) called this type of learning environment, where reasoning through thinking is valued, an atmosphere of thoughtfulness. Allen (2018) termed a safe learning space as a Socratic classroom. The Socratic method, named

after Socrates, encourages that learning be discovered by the learner rather than dictated by a teacher (Daniel & Auriac, 2011). According to Allen, the safe learning space is "where students are encouraged to question societal notions, understand the feelings and emotions of others, and consider multiple perspectives" (p. 4). The Socratic classroom promotes a shared approach to understanding truths collectively through a safe place to question underlying assumptions rather than grappling with complex concepts independently (Allen, 2018). The Socratic classroom also supports how to listen to others and "how to interact with others with an open mind and without criticizing other viewpoints" (Allen, 2018, p. 4). Other ideas for building a culture of critical thinking include instructional strategies, such as analyzing case studies, reading books from all disciplines, using primary sources, reading information from multiple sources, group discussion, classroom community meetings, think-alouds, student-instructor interactions, and class debates to promote dialogue (Allen, 2018; Martin-Hansen & Caton Johnson, 2006; Morgan & Rasinski, 2012; Staib, 2003). These are among the most effective instructional strategies to develop a culture of critical thinking and to develop students' critical thinking skills (Allen, 2018; Staib, 2003).

The Role of the Language of Thinking in the Learning Environment

Tishman et al. (1995) identified that teachers and students practice a higher level of thinking when they use precise word choice to name the language of critical thinking in the classroom. For example, when students name their thinking, the students explicitly identify when they are making a logical inference or seeking clarity on the question at issue (Paul & Elder, 2006). Dialogic teaching, the purpose of developing ideas and rationales, is an important strategy in a critical thinking classroom (Resnick & Schantz, 2015). In dialogic teaching there is

intellectual space for students to reason through their thinking and to express their ideas (Resnick & Schantz, 2015). Resnick and Schantz (2015) emphasized that creating a "culture, with shared purpose, shared expectations, shared standards for evidence, and shared beliefs and values" is of high value in the classroom (p. 346).

The Role of Real-World Experiential Learning in the Learning Environment

Nosich (2012) named the act of critical thinking an authentic learning experience. Abrami et al. (2015) emphasized the need for critical thinking instruction to be part of the real world, authentic context of the classroom. Real-world everyday problems bring forth opportunities to engage student as critical thinkers (Nosich, 2012; Resnick & Schantz, 2015; Staib, 2003). Overall, the values, attitudes, and habits of mind that the student and/or teacher bring to the classroom shape the culture of thinking and determine whether the classroom will embrace intellectual thought processes and critical thinking (Tishman et al., 1995).

The Role of Student Ownership of Learning in the Learning Environment

Elder and Paul (2008) noted that it is important" that students take ownership of the most basic principles and concepts of the subject" they are learning (p. 32). Elder and Paul (2008) promoted three ideas to support student ownership of learning. The first idea is that students should internalize the concept they are learning. For students to take ownership of their learning and evaluate their thinking, "instructors need to provide a variety of opportunities for them to (a) internalize the key concepts in the subject and (b) apply those concepts to problems and issues (in their lives or in their coursework)" (p. 32). The second idea is for students to engage in a dialogue with the text they are reading (Elder & Paul, 2008). Learning processes should support

students writing about their reading and assessing the quality of their interpretation is key (Elder & Paul, 2008). Third, students must assess the quality of their individual thinking and the thinking of others (Elder & Paul, 2008). Assessing one's own writing or the writing of others through peer assessment protocols can encourage self-assessment (Elder & Paul, 2008).

Enduring Element: Dispositions to Foster Critical Thinking

Philosophers (e.g., Ennis, 1996; Facione, 2013; Paul, 1992) and educators (e.g., Costa & Kallick, 2009; Marzano et al., 1988; Tishman et al., 1995) in the field of critical thinking have identified dispositions and instruction for students to become critical thinkers. Specifically, Costa (2008) and Tishman et al. (1995) emphasized habits of mind that support students in the development of intellectual dispositions. Students are encouraged to embrace time for exploration by embracing curiosity, wonderment, and awe in their thinking (Costa, 2008; Tishman et al., 1995). According to Staib (2003), real-life role-play is a beneficial strategy to develop students' critical thinking skills.

Building cognitive flexibility (Costa, 2008) into the process of thinking and organizing thinking (Tishman et al., 1995) are also important instructional practices that can foster dispositions of critical and quality thinking in classrooms. For example, students might take in the information that they see a fire truck in front of the school (Paul & Elder, 2001). One inference they might conclude is that there is a fire. In promoting cognitive flexibility, students recognize that they can make many other inferences about the fire truck and come to other conclusions (Paul & Elder, 2001). Metacognitive monitoring, also known as metacognition, supports the process of students thinking about their thinking (Halpern, 1998). This further establishes a learning culture that supports critical thinking dispositions (Halpern, 2003; Kuhn, 2000; Nosich, 2012; Ritchhart, 2002; Tishman et al., 1995). Lastly, Costa (2008), Tishman et al.

(1995), and Resnick and Schantz (2015) claimed that critical thinking takes time; therefore, time to practice critical thinking skills in the learning environment is essential to being a critical thinker.

Enduring Element: Thinking Skills Used to Practice Critical Thinking

One of the first components to being a critical thinker is to learn the specific skills to support critical thinking (Halpern, 1998, 2003). Paul (1992) explicitly targeted the components of how to think, rather than what to think, as central to student critical thinking outcomes. "Research tells us that effective critical thinking instruction is structured in a manner that engages students during a period in which a particular skill is introduced, requires deliberate practice, and provides students with the opportunity to transfer their knowledge" (Marin & Halpern, 2011, p. 4). Additionally, explicit, intentional practice is required to analyze, assess, and improve one's thinking (Paul & Elder, 2001), and this process is an essential step to learning content at a deeper level (Celuch & Slama, 1999). Deliberate critical thinking instruction includes asking students questions about the process of thinking and understanding how to support students' progression of dissecting their own thinking (Ennis, 1996; Marin & Halpern, 2011; Paul & Elder, 2001).

The skill of inquiry is fostered in classrooms as a way to promote student questioning and steer away from prescriptive questions, answers, and rote memorization (King, 2002; Stewart & Walker, 2005). Questions and answers for the sake of rote memorization and regurgitation of information, according to Nosich (2012), discourage critical thinking. Skilled thinking encourages the entertainment of diverse points of view (Paul & Elder, 2001; Ritchhart, 2002) and the act of contextualizing situations (Ennis, 1996; Nosich, 2012). Swartz (2003) and Marin and

Halpern (2011) emphasized key principles of critical thinking instruction as both the importance of teaching critical thinking and integrating critical thinking into content.

In 1941, Glaser conducted a seminal study on the development of critical thinking skills. Nappi (2017) elaborated on Glaser's study regarding the role students play as critical thinkers in recognizing problems, collecting information that is logical to the issue and the problem–solving process, and weighing the issues against beliefs and values in order to inform well–reasoned conclusions and decisions. Furthermore, other essential thinking skills, like making inferences, emphasize an individual's process from (a) their reasoning to making a conclusion or (b) an inference that can be the concluded as a result of the reasoning (Abrami et al., 2015; Ennis, 1996; Paul & Elder, 2001). The act of seeking clarity was another skill noted by multiple scholars to encourage assessment of thinking in the classroom (Abrami et al., 2015; Ennis, 1996; Paul & Elder, 2001; Tishman et al., 1995). When critically thinking, seeking clarity helps to alleviate misunderstandings (Ennis, 1996; Paul & Elder, 2001).

Enduring Element: Transfer of Learning

Halpern (1998, 2003) and Tishman et al. (1995) indicated that learning to think critically is intended to support students' transfer of thinking from one discipline to another. Instructional strategies such as finding alternate solutions to a problem, recognizing persuasive techniques used by an author, and visually representing information in a diagram or other graphic representation support transfer of learning from the classroom to the real world (Halpern, 2003). According to Tishman et al. (1995), transfer of knowledge from one discipline to another and thinking strategies that transcend from one context to another are necessary components of critical thinking instruction and critical thinking. Marin and Halpern (2011) and the Halpern (1998) model echoed the need for students to have an opportunity to transfer their knowledge

from the classroom to the real world. Sternberg (2001) also noted the importance of using real–life issues as a strategy for transference of learning from the classroom to the real world. To conclude, each critical thinking enduring element provides insight to analyze instructional practices that promote the implementation of critical thinking in the learning environment (Costa, 2008; Ennis, 1996; Paul & Elder, 2001; Ritchhart, 2002; Tishman et al., 1995).

The Role of School Leaders in the Improvement of Student Learning

The role of school leadership in the improvement of student learning has transformed over time (Leithwood & Seashore-Louis, 2012). In the early years, a school principal was deemed a manager and was responsible for establishing rules and procedures and for managing staff (Leithwood & Seashore-Louis, 2012). According to Leithwood and Seashore-Louis (2012), a shift from principal as manager to leader occurred in the mid-1970s. School principals were deemed effective leaders when they set high expectations for student learning and achievement, placed on emphasis on basic skills, increased teacher decision-making, staff cohesiveness, and established behavioral policies. From the 1990s on, principals have primarily taken on an instructional leadership role (Leithwood & Seashore-Louis, 2012). The following sections of the literature review will dissect the historical role of school leadership and best practices in the improvement of student learning in this section.

Instructional Leadership

Research shows that effective leadership improves student learning, and instructional leadership significantly influences student learning and achievement (Leithwood et al., 2004). According to Robinson et al. (2008), instructional leadership focused on teaching and learning gained a positive 0.42 effect size on student outcomes. Five instructional leadership practices, also known as dimensions, supported positive student outcomes (Robinson et al., 2008).

The five dimensions focus on establishing goals and expectations, using resources strategically, "planning, coordinating, and evaluating teaching and the curriculum" (Robinson et al., 2008, p. 33), concentrating on the leader's role in "promoting and participating in teacher learning and development" (p. 35), and the need for principals, as instructional leaders, to create an orderly and supportive environment (Robinson et al., 2008). Out of all five dimensions, the fourth dimension had the largest effect size on student outcomes, 0.84, emphasizing the need for school leaders to take the lead in the learning process alongside, at the forefront, and with their staff (Robinson et al., 2008). With the five dimensions of instructional practices, the principal's role of instructional leader is maximized.

Teacher Evaluation

Shifts in the roles of teacher supervision are noted in this chronological examination to better understand the progression of teacher evaluation. Marzano et al. (2011) cites Dewey's 1938 educational stance and Taylor's 1911 scientific management stance as differing viewpoints that both influenced the notion of teacher evaluation in the early 1900s. Dewey's approach to teacher evaluation emphasized student-centered education, students as active participants in their learning, student learning differentiated to meet student needs, and student learning designed to make real-world connections while integrating content into the learning (Marzano et al., 2011). In contrast, Taylor utilized a "scientific viewpoint of management" to determine the most efficient way to evaluate factory workers in their task performance (Marzano et al., 2011, p. 18). Taylor's stance on factory worker effectiveness transferred over to education as an approach to measure student skills (Marzano et al., 2011). The scientific method gained traction with engineers and business owners, and the scientific principles of determining what method best impacted K–12 education and schooling (Marzano et al., 2011).

Scientific Approach to Teacher Supervision

Influenced by Taylor, Thorndike's approach to measuring student outcomes in the early 1900s guided early teacher effectiveness (Marzano et al., 2011). Cubberley in 1916 and Wetzel in 1929 applied Thorndike's scientific principles to their approaches on how school principals manage schools (Marzano et al., 2011). In 1929, Wetzel (as cited in Marzano et al., 2011) proposed the following measures for a scientific approach to supervision: "The use of aptitude tests to determine the ability level of each child; the establishment of clear, measurable objectives for each course; and the use of reliable measures of student learning" (p. 15). Marzano et al. (2011) noted that during the 1930s, the scientific approach to schooling, including standardized tests, conflicted with Dewey's desire to foster democratic ideals and overall social development. "Dewey's focus was more on the ultimate goal of education" (Marzano et al., 2011, p. 15). According to Dewey (1910/1933) the goal of education was to be intellectually educated and to train the mind to cultivate habits of inquiry and reasoning.

Teacher Effectiveness Post-World War II

After World War II, the notion of teacher effectiveness and role of supervision shifted briefly from emphasizing a scientific approach to focusing on the teacher as an individual (Marzano et al., 2011). The supervisor role also received attention with a lengthy list of duties. Although this transition period up to the clinical supervision era was short lived, the conclusions were that classroom observations played an important role in teacher supervision and evaluations influenced the supervision movement (Brophy & Good, 1986; Marzano et al., 2011).

Clinical Teacher Supervision and and the Goldhammer Model

Clinical supervision gained momentum in the 1950s, and by the 1980s it was widely adopted by school administrators (Marzano et al., 2011). During this time of mass adoption, Goldhammer (1969) created a clinical supervision model based on five phases that included embedded dialogue between the teacher and supervisor. The first phase was a pre-observation conference followed by phase two, a classroom observation. The classroom observation provided data for the third analysis phase. In phase four, the teacher and the supervisor conferenced together. Lastly, Goldhammer referred to phase five as the "analysis of the analysis" (p. 22). During this phase, the supervisor was asked to reflect on the process used when supervising the teacher. The Goldhammer model was implemented with five phases and emphasized dialogue between the teacher and supervisor during the supervision process.

Hunter Model for Mastery Teaching

Hunter's model in 1980/1984 was highly influential in the mid–1980s through the late 1990s (Marzano et al., 2011). Hunter's model focused on the seven components essential to lesson design and mastery teaching (Marzano et al., 2011; Stallings et al., 1986). It was designed to "improve teacher decision making and thus enhance student learning" (Danielson & McGreal, 2000, p. 13). These lesson elements included the anticipatory set, an objective and purpose, input, modeling, checks for understanding, guided practice, independent practice, and closure to the lesson (Marzano et al., 2011; Stallings et al., 1986). Based on the Hunter lesson model, the supervisor's evaluation of the teacher's lesson delivery determined teacher effectiveness (Marzano et al., 2011), yet there was no direct correlation to a positive impact on student learning (Danielson & McGreal, 2000).

Teacher Supervision and Teacher Evaluation Endure a Conflicting Era

During the 1980s, many researchers and theorists evaluated past conceptions of clinical supervision, bringing forth perspectives other than Hunter 1980/1984 regarding the role and purpose of supervision (Marzano et al., 2011). Glathorn in 1984 prioritized teacher goals in the supervision approach (Marzano et al., 2011); whereas, McGreal (1983) differentiated teachers' years of experience, similar to tenure, with the levels and types of supervision needed (Marzano et al., 2011). Glickman (1985) "affirmed that the most important goal of supervision was to improve instruction" (Marzano et al., 2011, p. 22). During this time, Wise et al. (1984) with the RAND group also conducted a study focused on the current supervision and evaluation practices (Marzano et al., 2011). The study brought forth five conclusions and recommendations regarding teacher evaluation (Wise et al., 1984). This era revealed multiple opposing points of view about the role of teaching, quality instruction, and clinical supervision (Danielson & McGreal, 2000; Marzano et al., 2011) while setting "the stage for an emphasis on teacher evaluation" (Marzano et al., 2011, p. 22).

Danielson Model for Teacher Supervision, Evaluation, and Classroom Teaching

In 1996, the Danielson model was published which offered a framework for supervision, evaluation, and classroom teaching, (Marzano et al., 2011). According to Marzano et al. (2011), this seminal model was comprised of four domains: "planning and preparation, the classroom environment, instruction, and professional responsibilities" (p. 23). Within the approach, Danielson identified 76 elements of quality teaching that were rated as unsatisfactory, basic, proficient, or distinguished (Marzano et al., 2011). Until Danielson, teacher evaluation had not

been so comprehensive as to include quality teaching domains, quality teaching elements, and a quality teaching rating scale (Marzano et al., 2011).

Twenty-First Century Shifts in Principal Evaluations of Teachers

In the beginning of the 21st century, the evaluation process shifted again (Marzano et al., 2011), and student achievement and classroom observations played an integral role in the teacher evaluation process (Tucker & Stronge, 2005). After lengthy research into four school districts' approach to teacher evaluation, Tucker and Stronge (2005) advocated that the teacher evaluation should be informed by student achievement data and that student achievement data should also determine "the effectiveness of schools, administrators, and teachers" (p. 102). The *Rush to Judgment* report (Toch & Rothman, 2008) expressed skepticism regarding principals' evaluation skills and the process used to help teachers improve their performance. The No Child Left Behind act (USDOE, 2005) requirements for teacher quality also brought uncertainty to state No Child Left Behind act requirements because less than 15 states "required school systems to do annual evaluations of teachers" (Marzano et al., 2011, p. 30). The efforts to prioritize student learning and achievement, while good in theory, fell solely on standardized achievement tests, which are not a complete representation of student learning (Toch & Rothman, 2008).

The *Widget Effect* report (Weisberg et al., 2009) was released in 2009 on the heels of the *Rush to Judgment* report in 2008 (Toch & Rothman, 2008). The primary purpose of the *Widget Effect* report was to "address our national failure to acknowledge and act on differences in teacher effectiveness" (Weisberg et al., 2009, p. 2). According to Weisberg et al. (2009), student achievement was greatly impacted by teacher effectiveness and there was little being done to address teacher effectiveness. This call to action to improve teacher evaluation was received, and

six years after the *Widget Effect* report was released, Kraft and Gilmour (2017) reported that many states showed an increase in instruction-based observations; additionally, teacher ratings were evident in numerous categories, teacher ratings varied from good, fair, and poor, and student achievement was included in the evaluation process.

Teacher Evaluations and the Role of Classroom Observations

Classroom observations are a popular method for evaluating the quality of teaching (Mashburn et al., 2013). "Observational measures of teacher instructional practice have emerged as critically important components of teacher ratings" (Garrett & Steinberg, 2015, p. 225). Classroom observations are a useful evaluation tool; however, classroom observations present a quick snapshot of a much larger and more complex learning environment (Lemahieu et al., 1997). Furthermore, classroom observation tools vary (Garrett & Steinberg, 2015). Lemahieu et al. (1997) suggested five lenses integral to classroom observations: content standards, standards for performance and assessment, the role of dialogue and coaching in relation to instructional practices and in relation to student learning, and the significance of the context and environment that included cultural backgrounds and student interests. Lemahieu et al. emphasized instructional leadership, noting that "the use of these lenses can only be effective if both the principal and the teacher share an understanding of the terminology, underlying concepts, and instructional practices embedded in the model" (p. 599). Classroom observation protocols can provide a concrete connection from observable behaviors to teaching practices (Garrett & Steinberg, 2015).

School Principals' Roles in Evaluating Teachers' Critical Thinking Instruction

School principals' roles in evaluating teachers' critical thinking instruction lies central to the literature review's three areas of focus (see Figure 1). Principals are responsible for supporting and developing teachers in their instructional practices (Davis et al., 2005) and for enhancing teachers' pedagogical skills (Marzano et al., 2011). Likewise, principals, also notated as teacher evaluators in this study, are also responsible for evaluating and determining overall teacher effectiveness (Marks & Printy, 2003) with a focus on positive student achievement and outcomes (Stronge et al., 2007). The principal, or teacher evaluator, utilizes classroom observations as a widely used evaluation tool to inform this process (Cohen & Goldhaber, 2016).

The Cohen and Goldhaber (2016) study emphasized the need for observation training for either school leaders or content experts to provide teachers with useful observational feedback. Additionally, Cohen and Goldhaber stressed that when using observations in the evaluation process, "we need to develop greater conceptual clarity around the features of instructional quality" (p. 384). Moreover, the studies on critical thinking and teacher evaluator ratings generated by classroom observations are minimal. Multiple studies have researched varying aspects of principal evaluations on teacher effectiveness, including value-added measures, the correlation with student achievement, the use of valid and reliable tools and measures for classroom observations, and the role of classroom observations in the teacher evaluation process (Bergin et al., 2017; Briggs & Dadey, 2017; Garrett & Steinberg, 2015; Jacob & Lefgren, 2008; Rockoff et al., 2012; van der Lans et al., 2016).

Bergin et al. (2017) used a quantitative approach in collaboration with the Missouri State Department of Elementary and Secondary Education to align evaluation practices of 1,324 principals to study evaluator rater accuracy. The quantitative approach utilized the Many-Facet

Rasch model as a tool to "systematically evaluate rater accuracy based on the alignment between operational and criterion ratings" (Bergin et al., 2017, p. 20). In the research on evaluator accuracy, Bergin et al. indicated that after a three-day training in evaluation practices, critical thinking was "the easiest teaching practice to rate accurately" (p. 22) according to a summative evaluator assessment exam that took place at the end of the training. This high yielding outcome was the result of principals receiving additional training on "what critical thinking is (e.g., a reasoned argument or solving an ill-structured problem) and is not (e.g., spouting opinion or routine use of an algorithm)" (p. 24). Additionally, critical thinking was evaluated as a teaching practice that focused on the generalized use of instructional strategies that the teacher used "to get students to problem solve and think critically" (p. 22). Though principal scoring alignment in regard to critical thinking was high in this study, there is a gap in the literature in how principals identify the use of critical thinking in teacher practices. Principals as teacher evaluators play a key role in helping teachers use effective instructional practices in the overall evaluation of teacher effectiveness (Marks & Printy, 2003) and identify teacher practices used to teach critical thinking in schools and classrooms today (USDOE, 2010).

Conclusion

This literature review included an in-depth summarized historical discussion to further the inquiry about the school principal's role as a teacher evaluator in evaluating teachers' critical thinking instruction and practices in the classroom. In the examination of current leadership practices in relation to critical thinking, Fisher et al. (2016) advised that to implement critical thinking, educators need clarity on knowing what students need to learn. In the Bergin et al. (2017) study, though principal scoring alignment in regard to critical thinking was high in this study, there is a dearth of research regarding qualitative data to support the definition of critical

thinking and the identification of teacher practices used for critical thinking instruction. Further research is needed to better understand how principals define and identify critical thinking used in teacher practices in the general education setting.

CHAPTER III

METHODOLOGY

Creswell (2007) stated that the qualitative research design is focused on an improved understanding of a phenomenon. Within a phenomenon, a constructivism epistemology supports the "meaning-making activity of the individual mind" and values the unique experience of the individual (Crotty, 1998, p. 58). Through an interpretivist theoretical framework and a constructivist case study methodology (Creswell, 2007; Stake, 1995), this research sought to understand how Colorado principals bounded within a specific school district define critical thinking and how they identify the use of critical thinking in teacher practices in the general education classroom. Data were gathered from multiple principals to "gain an in-depth understanding of the situation and meaning for those involved" (Merriam, 1998, p. 19). In this chapter, the research approach in this study is explained and further explored in the subsequent sections: qualitative design rationale, case study methodology, and the specific methods used for the inquiry.

Restatement of the Problem

In Colorado, the teacher evaluation process occurs each academic year, and a state approved evaluator is responsible for completing the professional practices portion of the Colorado State Model Evaluation System (CSMES; Colorado Department of Education [CDE], 2017b, 2019b). The CSMES process involves an individual evaluation of each educator within a school building. The principal, as the evaluator, is responsible for assessing multiple aspects of teacher performance, one of which is an educator's ability to effectively promote critical thinking

as stated in Quality Standard III, Element D (CDE, 2019c). In the field of education, authors have analyzed the concept of critical thinking and stated the desire for the implementation of critical thinking in education; however, there is insufficient understanding of how to teach, assess, and evaluate for critical thinking (Beyer, 1987; Darling-Hammond et al., 2017; Darling-Hammond & Oakes, 2019; Gormley, 2017; Lipman, 1988; National Commission on Teaching and America's Future, 1996; Partnership for 21st Century Skills [P21], 2008; Paul, 1992; Paul & Elder, 2001).

Specific to this study was the need to discern how principals define what critical thinking is and identify how critical thinking is used in teacher practices in the general education.

Research Questions

The explanatory research questions (Yin, 2003) guiding this inquiry are as follows:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

To further explore Colorado principals' conception of critical thinking, a subsequent question follows:

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

Qualitative Design Rationale

Qualitative research embodies multiple pathways to understand and interpret social phenomena (Merriam, 1998; Yin, 2003) like that of critical thinking in schools today. Merriam (1998) stated that a fundamental assumption of qualitative research is that individuals interact in their social worlds, and the construction of their reality is a result of their interactions. Furthermore, according to Creswell (2007), qualitative research provides a mode of inquiry to analyze a social or human problem within a natural setting. Throughout many decades of

schooling, educators have been in the process of constructing (i.e., making sense of) the concept of critical thinking (Beyer, 1987). Epistemology, according to Crotty (1998), is the process of understanding and explicating "how we know what we know" (p. 3). A qualitative approach grounded in a constructivism epistemology was well suited for this research because the researcher aimed to (a) explore how principals have constructed their definitions of critical thinking and (b) explore how principals identify teacher practices that promote critical thinking in the classroom setting.

Case Study

Case study is a qualitative research methodology that is rooted in the interpretivist theoretical framework (Crotty, 1998). This case study was bound to a setting, or more specifically, a particular school district (Creswell, 2007). While an intrinsic case study is designed to understand a specific, unique case, this inquiry was designed as an instrumental case study (Creswell, 2013; Stake, 1995). As an instrumental case study, this inquiry further supported the understanding of an issue (Stake, 1995). The issue specific to this inquiry was to understand the principals' definitions and identification of critical thinking in teaching practices.

This methodology served as the guiding roadmap to connect selected methods, and these methodological connections were used to achieve the desired outcomes in this study (Crotty, 1998, p. 3). Creswell (2007) stated that using multiple sources of data in the data collection process, such as interviews, artifacts, observations, and documents are important to inform thematic development. Key to the findings in case study is a "rich, 'thick' description of the phenomenon under study" (Merriam, 1998, p. 29). The saturation of data occurs when there is no new information gathered (Creswell, 2007). Flexibility throughout the research process is also essential in qualitative research (Crotty, 1998), and the constant comparative method is used

when analyzing data and "comparing different pieces of data against each other" to look for similarities and differences (Corbin & Strauss, 2015, p. 85).

In this study, qualitative research was well suited for research on critical thinking, specifically as it relates to the field of education, because participants can share their perspective and insights in their own words. The themes were derived from actual data from the field of practitioners. "Case study has proven particularly useful for studying educational innovations, for evaluation programs, and for informing policy" (Merriam, 1998, p. 41). This instrumental case study has the potential to have greater application to educational practices and situations (Merriam, 1998).

Methods

Methods are tools, "techniques, or procedures used to gather," analyze, and interpret data related to a question or hypothesis in education research (Crotty, 1998, p. 3). The development of an "in-depth description and analysis of a case" (Creswell, 2007, p. 78) in this research study utilized a constellation of methods to apply systematic guidelines while providing flexibility for the collection and analysis of qualitative data in order to use the data to better understand a phenomenon (Merriam, 1998). This research study relied on data gathered from individual interviews with principals who utilized the CSMES, from documents and artifacts, and from a researcher field journal. In addition, multiple methods of data collection improve the "triangulation and trustworthiness of the data," according to Dimmock and Lam (2012, p. 194).

Sampling

This case study research design initiated selective sampling procedures based on specific criteria at the onset of the research process (Creswell, 2007; Patton, 1990; Vogt et al., 2012). Selective sampling criteria included participant population, site or location, and approaches for

participant recruitment (Draucker et al., 2007). The participants were selected based on their potential to contribute to the understanding of a phenomenon (Merriam, 1998) and on criteria-based sampling procedures.

Criteria used to select the state of Colorado were based on the Preschool to Postsecondary Education Alignment Act of 2009 (2009) and specific to the directive that "public education must encourage and accommodate students' exposure to and involvement in postsecondary planning and in activities that develop … critical-thinking and problem-solving skills" (p. 4) and the critical thinking emphasis in the Colorado Academic Standards and Essential Skills framework (CDE, 2020a). According to the Preschool to Postsecondary Education Alignment Act of 2009, principals are bound to ensure that teachers are teaching the Colorado Academic Standards. The Colorado Academic Standards include the Essential Skills framework that are specific to the mastery of generalized critical thinking skills (CDE, 2020a). Principals in Colorado are responsible for teacher evaluations and specifically the evaluation of critical thinking. The population in this study was identified as elementary Colorado principals who had a teacher evaluator role in public education, had been trained in the CSMES tool, and utilized the CSMES. The teacher evaluator role is defined by Colorado state law as,

> an individual who has completed a training in evaluation skills that have been approved by the Colorado Department of Education (CDE). As such, any person who conducts an evaluation of school licensed personnel must hold a principal or administrator license or complete a state approved evaluation training program. (CDE, 2017c, para. 1)

The purpose of selecting principals from one Colorado school district was the school district's strategic action plan that focuses on the traits of a graduate that includes being a critical thinker as one of the top five competencies. Additionally, elementary-level district work focused on

critical thinking (CSMES Quality Standard III, Element D) occurred in 2018–2019 and prompted principals to make meaning of critical thinking as it relates to their own understanding and teacher practices in relation to the evaluation process.

Evaluators selected were from one district in Colorado representative of both urban and rural settings with a range of student demographics. The student population size for the district was approximately 16,000 students. At the elementary school level, 41% of students in the district identified as qualifying for Free or Reduced Priced Lunch program, and 28% of students identified as a minority. Conducting the study in this school district may assist in understanding the phenomenon in relation to multiple student populations.

Data Collection

Data collection focused on up to an hour-long individual semi-structured interviews, document and artifact data, and a researcher field journal (Lincoln & Guba, 1985; Thorne, 2000; Vogt et al., 2012; Yin, 2003). The methods in this research design were purposefully and intentionally constructed as an approach to investigate how Colorado principals defined critical thinking and identified the use of critical thinking in teacher practices in schools. The following sections detail descriptions of the data collection process specific to this inquiry.

Research Permission for Participant

Adherence to the University of Northern Colorado's Institutional Review Board research guidelines and protection of human participants was a critical component of this study. Prior to submitting for Institutional Review Board review and approval (see Appendix A), I contacted the district superintendent and/or research designee by phone and through email. This included a standard greeting, an informative letter about the research study, the timeline, and a request for permission for the district employees to participate in the study (see Appendix B). After this

process, the Institutional Review Board application was submitted, reviewed, and approved by the University of Northern Colorado Institutional Review Board. After Institutional Review Board approval, I reached out by phone or email to personally contact the potential participant to obtain their consent and to initiate rapport building. If the evaluator did not respond to the phone call and/or email communication, a second consent form and communication was sent one week later (see Appendix C).

The organization of information in the data collection stage is key in safeguarding the participants (Creswell, 2007). All data collected and participant consent forms were kept in a secured file and locked cabinet in my research adviser's office. Recorded interviews were transcribed (Vogt et al., 2014), stored, and kept confidential on my password-protected computer to ensure physical safekeeping of the data (Lincoln & Guba, 1985). Additionally, the field journal and any documents or artifacts were also kept confidential on my password-protected computer.

Semi-Structured Interviews

The initial data collection phase in this study consisted of semi-structured interviews which are well suited for case study (Merriam, 1998). The semi-structured individual interviews were intended to discern the participants' definitions of critical thinking and how the participant identified critical thinking used in teacher practices in the classroom. The interview process facilitated a flexible, open–ended yet directed, in–depth exploration of the principals' understanding and perceptions (Charmaz, 2014).

At the beginning of each interview, I obtained written consent from each participant. I used a standard protocol to describe my role as a doctoral student at the University of Northern Colorado and provided an overview of the research study with the interviewees (see Appendix

D). In order to build rapport and trust in the interview process, I provided time for a friendly greeting. Additionally, it was important to address any questions the participant had regarding participation in the study (Coleman, 2012). Initial questions in the interview served as an overarching scan of participants' demographic information and to ease the participants in the interview environment (Lincoln & Guba, 1985).

The majority of the semi-structured interview utilized open-ended responses (Creswell, 2007; Vogt et al., 2014). According to Coleman (2012), questions that are structured as open-ended questions give the participants the opportunity to capture their personalized response to the question. Additionally, the semi-structured interview process allows for flexibility in the interview to explore, probe, and expand concepts as deemed necessary by the researcher (Charmaz, 2014). Questions in this section were adapted from a study done with the California Commission on Teacher Credentialing known as the *California Teacher Preparation for Instruction in Critical Thinking: Research Findings and Policy Recommendations* (see Appendix E; Paul et al., 1997). The questions were designed to reveal the participants' definition of critical thinking and how they identified critical thinking used in teacher practices in their school environments. A couple of the interview questions included: Would you explain to me your concept of critical thinking? Can you think back to an instance where you witnessed a teacher fostering critical thinking and describe that for me?

The interviews were held with 12 participants and took place in person or remotely. The time and date for the interviews was communicated to the participants with two weeks' notice when possible. A list of the interview questions was provided for the participant during the interview. All interviews were scheduled to accommodate the participants' needs, schedule, and

level of comfort and adhere to up to a one-hour timeframe. All interviews were recorded on a password-protected secure computer device (Lincoln & Guba, 1985).

Document and Artifact Data

Document or artifact data provide a rich source of information as the data are represented in the "natural language of that setting" (Lincoln & Guba, 1985, p. 277). Documents or artifacts can be a fruitful source of data collection especially when using constant comparative analysis (Birks & Mills, 2015). In the individual interviews, an electronic link, such as Google Drive, was offered for the participants to share any documents or artifacts that support their responses (Vogt et al., 2014). Documents that participants elected to share could include pictures of classroom anchor charts, lesson study samples, critical thinking resources, observation checklists or evaluation tools, unit organizers, and other items that illustrate the definition of critical thinking and/or demonstrate how the use of critical thinking is reflected in teacher practices in the classroom. Participants had an opportunity after the individual interviews, and within a week of the interview, to send or share information either electronically or via hard copy. Instructions on how to share this information was included in an email (see Appendix F) sent after the individual interview was completed.

Field Journal

Field notes play an integral role in case study research (Merriam, 1998). Throughout the research study, a field journal was used to document participant responses and my interview observations (Birks & Mills, 2015). My field journal was used to capture a descriptive record of information (Patton, 1990). Information recorded was dated and indicated location of the observation (i.e., virtual), person (pseudonym) who was present, notes on physical environment, and other significant information to describe the interview being observed (Patton, 1990). The

field journal also captured my own thinking, specifically biases and other questions during the interviews.

Data Analysis

Creswell (2007) identified multiple analysis strategies, including preparing and organizing data as an initial strategy. Next, I utilized open, axial, and selective coding (Strauss & Corbin, 1998) to reduce large amounts of data into categories and ultimately into an analysis of themes (Creswell, 2007). Another component of data analysis is the representation of the data in a visual representation or a discussion (Creswell, 2007). Lastly, according to Merriam (1998), the process of "making sense out of the data involves consolidating, reducing, and interpreting what the researcher has seen and read" (p. 178). Creswell (2007) noted patterns that correspond between two or more categories can support the constant comparative analysis method (Corbin & Strauss, 2015; Glaser & Strauss, 1967) and the analysis of looking for similarities and differences in the data. The constant comparative analysis method is comprised of four stages, three of which were applicable to this inquiry: (a) coding incidents through a comparison procedure, (b) analyzing and integrating identified categories, and (c) categorical saturation that streamlines and reduces the categorical focus (Glaser & Strauss, 1967).

Organization of Data Collected: Interviews, Field Journal, Artifacts and Documents

The organization of the conceptual process that occurs during data collection and data analysis stages is important. During the data collection process, coded data from the individual interviews were inputted into an organizer, along with the coded data from the documents, artifacts, and field journal (Birks & Mills, 2015; Vogt et al., 2014) and annotated with memo writing. The organizer was designed to represent each data source; for example, individual

interviews, documents and/or artifacts, and my field journal were centralized components to the data collection process. Additionally, the process included open and axial coding of the data and space for memo writing to allow for the data analysis process to encompass the constant comparison analysis method, saturation of categories, and emerging themes. Other visual representations that transpired in the analysis stage were uploaded into a document as well. Prior to data analysis, interview transcripts underwent member checking to provide participants with an opportunity to clarify or expand their remarks and to ensure the interview transcript was an accurate transcription (Creswell, 2007).

Memo Writing

Memo writing also played a key role in the data analysis process (Creswell, 2007). Charmaz (2014) explained that these informal analytic notes assist in developing ideas, alter succeeding data gathered, and allow critical awareness of the researcher's role in the research study. "Memos give you a space and place for codes, codes and category, and category and concept," and they give a space for analyzing the comparisons and stating inferences (Charmaz, 2014, p. 163). Memo writing can also help to capture my audit trail by giving me a space to record my thinking and help me to document any bias I may have had during the data collection and data analysis processes (Charmaz, 2014).

Open Coding: Interviews, Field Journal, Artifacts, and Documents

Data from the interviews, field journal notes, artifacts, and documents were analyzed using an open coding process (Creswell, 2007) and utilizing the constant comparative method to look for similarities and differences (Charmaz, 2014; Glaser & Strauss, 1967). An example of the coding process may occur at the word level or line-by-line level (Charmaz, 2014). The

constant comparison method permitted analysis of data from one source and data from another source to be compared in order to help develop initial categories (Charmaz, 2014). Open coding began the process of building categories, yet these categories were still underdeveloped at this data analysis phase (Vogt et al., 2014).

Axial and Selective Coding: Emerging Categories and Development of Themes

Axial coding is an additional analysis of the categorical data that emerged from the open coding process. This second review of the data provided further insight into specific categories or patterns to support the development of themes (Creswell, 2007). Additionally, comparing data similarities and differences continued to support the refinement of categories and emerging themes. This process continues to use a constant comparative method like that of cooking a fine reduction. Together the semi-structured individual interviews, document and artifact data, and the field journal provided a rich body of triangulated data (Creswell, 2007).

Finally, I utilized selective coding to choose the themes best suited to answer my research questions. Having used constant comparison throughout the process, after my final data had been examined, selective coding was the last stage in completing my analysis. In this final stage, I eliminated themes generated from the axial coding stage that did not have enough support from the data to continue, and I established connections between the themes.

Trustworthiness

In qualitative research, Guba (1981) proposed four key terms to identify trustworthiness: credibility, transferability, dependability, and confirmability. To secure the research design was trustworthy, clear steps were taken to ensure the research processes were transferable,

confirmable, credible, and dependable (Lincoln & Guba, 1985). Each component was represented in this research process and detailed below.

Credibility

According to Lincoln and Guba (1985), credibility is a critical component of trustworthiness. Corbin and Strauss (2015) defined credibility as research that has trustworthy and believable findings. Furthermore, credibility is relayed when the participants, readers, and researchers can relate to the findings and acknowledge that the proposed finding is one possible interpretation of the data collected in the study (Corbin & Strauss, 2015). The use of the constant comparative method in this research inquiry is a way to secure credible, valid findings, which is a critical component of the data analysis process (Silverman, 2005).

To establish a basic rapport prior to participants engaging in the research study, a letter introducing myself to the participants was included in the initial communication (see Appendix A; Guba, 1981; Shenton, 2004). During the individual interviews, time to greet the participant, share a quick hello, and make a connection supported a more familiar, less formal approach for the interviewees as they each participated in the research and specifically engaged in the individual interview process (Lincoln & Guba, 1985). Building trust is one example of an activity that "increases the probability that credible findings will be produced" (Lincoln & Guba, 1985, p. 301).

Credibility in the research design is also ensured through member checking (Vogt et al., 2014). Member checking gave each participant an opportunity to verify the interpretation drawn from the interviews (Corbin & Strauss, 2015). Member checking included asking the participants to review the interview transcripts after the interview. These member-checking opportunities

provided opportunities for participants to verify their statements and provided clarity regarding my interpretations.

Transferability

Transferability in this case study inquiry required having a "thick" description of the phenomenon (Merriam, 1998, p. 29). Sharing examples that offered breadth and depth to this research inquiry supported readers in their own understanding of the phenomenon and allowed them to compare this investigation to their own circumstances (Dimmock & Lam, 2012; Shenton, 2004). The sampling criteria (Guba, 1981) supported transferability and the likelihood that the findings resonated with a similar population (Dimmock & Lam, 2012). Additionally, perspectives and insight into the inquiry were shared in the participants' own words, and the categorical saturation and themes originated from actual data from practitioners working in everyday situations. Therefore, there was a greater likelihood for transferability and application to educational practices and situations (Corbin & Strauss, 2015).

Dependability

The use of three types of data collection (i.e., semi-structured individual interviews, document and artifact data, and a field journal) are intended to provide multiple, complementary, over-lapping data to ensure credibility and dependability (Guba, 1981; Lincoln & Guba, 1985). Dependability, or reliability, was also achieved in this inquiry because the research design, detailed descriptions of data gathering, and thorough reflection of the effectiveness of the research processes was clearly written (Shenton, 2004). The process of documenting how "data were *collected* and *analyzed*" and how "interpretations were made" is known as the audit trail (Guba, 1981, p. 87, emphasis in original). The audit trail (Guba, 1981; Shenton, 2004) is a clear research pathway that explicated the decisions and procedures executed in the research approach

and design. Memo writing (Charmaz, 2014) captured the audit trail as well as provided a means to articulate any researcher bias that may have presented itself.

Confirmability

Lastly, confirmability is supported by a triangulation of data that is designed to minimize the researcher's bias (Guba, 1981; Lincoln & Guba, 1985; Vogt et al., 2014). The data from each interview, field note, document, and artifact supported triangulation by using two or more types of data to answer the research questions (Vogt et al., 2014). The intention to minimize bias through the data collection and data analysis process ensures confirmability (Lincoln & Guba, 1985). Maintaining an awareness of my relationship to the study of critical thinking and to the participants in the study required reflexivity, a component of bracketing (Birks & Mills, 2015). My field journal captured initial questions and biases in the interview process. Throughout this research inquiry, memo writing provided a means to capture and record any of my biases that may have interfered or influenced the research process (Charmaz, 2014). Memo writing served as a useful tool to capture my bias, struggles, celebrations, insights, and questions throughout the data analysis process. The process of memo writing was something I looked forward to engaging in as my underlying assumptions were challenged in new ways.

Researcher Bias

I have been in the field of education for 25 years and currently hold the position of school principal. When I first began learning about critical thinking 21 years ago, I was a special educator who worked with students with mild to moderate needs and learning disabilities. In working through the theory, definitions, conceptions, and pragmatic applications of critical thinking defined by the International Foundation for Critical Thinking (Paul & Elder, 2001, 2006), I began a personal and professional journey to improve the quality of my thinking and my

practices as an educator by infusing critical thinking into my work with students, the climate and culture of my classroom to foster a safe environment for all students to be a critical thinker, and now the school. As I embraced this journey, my work, which began with the International Foundation for Critical Thinking (Paul & Elder, 2001, 2006), ignited a discontent with how little I knew about my own quality of thinking. I found myself with little skills to teach my students to be fair-minded critical thinkers.

I later became a kindergarten teacher, and I was determined to teach young children to think critically. I infused the Paulian theory from the International Foundation of Critical Thinking (Paul, 1992; Paul & Elder, 2001, 2006) into my daily life, both personally and professionally. As a kindergarten teacher, I rewrote my units of study to embrace concepts and enduring understandings and slowly integrated a language of critical thinking with young children that many would say is impossible. Over and over, I encountered opposition such as the belief that young children are not able to understand what an inference was, or that young children were not able to assess their thinking with a standard of clarity or relevance. It was my mission to prove that young children have the capacity to think critically in a developmentally appropriate way. Slowly, I began to see the fruits of my labor and persistence. Parents began to call me or write in the Friday folders that their child was making inferences in the car, and then the child would state that it was accurate and why. The students were taking the beginning steps to think with criticality. Because of these efforts, the efforts of other teachers to prioritize critical thinking and our building principal maintaining a clear vision, our school received a high recognition by the Foundation for Critical Thinking for the work we were doing.

Over the years, I became a district level kindergarten–12 (K–12) Critical Thinking Teacher on Special Assignment and a Professional Learning Coach. By supporting multiple

schools, individual teachers, and teams of teachers, and by providing professional development for all levels of staff, we gained momentum in critical thinking in our district. I embraced what I considered priority: to teach students to think critically. In 2010, I helped write the Colorado Academic Literacy Standards, which included me leading the development of the Early Childhood through 12th grade Research and Reasoning strand. Now I am currently a building principal at an elementary school. I am also a Scholar of the International Foundation for Critical Thinking and work as a consultant for the Foundation that has afforded an incredible journey. At the heart of it all is quality, strong–sense critical thinking.

My underlying assumptions about evaluators and how they define and identify the use of critical thinking in teacher practices in the classroom are complex. I believe that evaluators want their teachers to teach students how to think critically. I believe that small intermittent components of critical thinking exist; however, I am not certain there is a place where the quality and criticality of students' thinking is the primary objective of student learning. Therefore, I infer that the participants in the study will do their best to respond with honesty and integrity, and I will maintain an objective position as the researcher while utilizing my field journal and memo writing to keep record of my biases (Birks & Mills, 2015; Charmaz, 2014).

Limitations

The data collection process, while sufficient and purposeful for this inquiry, could be enhanced. Though semi-structured interviews provided a meaningful exchange for collecting data, classroom observations for the purpose of observing teacher practices specific to critical thinking would have provided an additional opportunity to collect contextual data to add to the "thick" description of the phenomenon (Merriam, 1998, p.29). The contextual data collected from classroom observations may have offered further insight into the principal's identification

of teacher practices that promoted critical thinking. Furthermore, classroom observations may have also added to the findings specific to rating teacher effectiveness in relation to Quality Standard III, Element D (CDE, 2019c) in Colorado. Classroom observations could have supported interrater reliability regarding the definition of critical thinking and the evaluation of teacher practices that promoted critical thinking student outcomes. The observations would also have enriched the confirmability of the findings through the triangulation of data (Vogt et al., 2014). Given the data collection time period, safety parameters specific to Coronavirus disease (Covid-19) and the global pandemic impacted the opportunity to include classroom observations in the methods in this inquiry.

Summary

This constructivist qualitative proposal is designed to better understand a phenomenon by answering these two research questions:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

The qualitative research methodology best suited to answer the research question was instrumental case study because participants were teacher evaluators who shared their definitions and identification of critical thinking in teacher practices in their own words and with their own sense of meaning making. Beyond the interview data collection, the artifacts and the researcher field journal, constant comparison analysis supported the methods used to seek categorical saturation and thematic development (Corbin & Strauss, 2015; Creswell, 2007). Member checking and triangulation of data ensured trustworthiness in the research process (Bassey, 2012). Overall, the transferability and application of the research findings to current and future

educational practices (Corbin & Strauss, 2015) may help inform educational leaders on how critical thinking is defined and identified in teacher practices in the general education setting.

CHAPTER IV

FINDINGS

This instrumental case study was designed to understand how principals, who use the Colorado State Model Evaluation System (CSMES) to evaluate critical thinking teacher practices, define critical thinking and identify critical thinking utilized in teacher practices. During the data collection process, 12 participant interviews ranged from 15 minutes to 1 hour. The interview transcripts produced from the semi-structured interviews were from 10 pages to 30 pages in length. This chapter focuses on the research results. These findings are presented as themes in relation to each research question. The themes emerged from the analysis of the semi-structured interviews conducted with 12 participants and the data from the researcher's field journal. Participants did not elect to share any artifacts. Pseudonyms were assigned for principals, their schools, and other personally identifiable information to protect privacy. Participant information is shared to highlight years in a principal role and years in their current building assignment as background information that supported the inquiry. This chapter includes themes that are directly related to the research questions.

The following two research questions were used to guide this inquiry:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

Numerous themes related to the research questions were illuminated. Three themes emerged from Research Question Q1. Theme one was that critical thinking has many interpretations. Principals had many diverse, independent ideas about critical thinking. Next, theme two was that critical thinking includes a wide variety of skills. Critical thinkers are able to do a variety of higher order, complex thinking skills. Lastly, theme three was that critical thinking is embedded in education programs. Principals shared a multitude of programs that embed critical thinking into a program and/or named curriculum.

During the data analysis phase, two themes emerged from Research Question Q2. Theme one was that principals identify critical thinking through student engagement; in other words, the level at which students are engaged in student-talk, academic discourse, and critical thinking processes was key to the identification of critical thinking in teacher practices. The second theme in relation to Research Question Q2 was that principals identify critical thinking through the teacher's intentional instructional design of learning. The learning environment reflects how teachers design learning opportunities. Specific to this inquiry, teachers balance the demands of teaching content with instructional routines that develop students as critical thinkers.

Participant Demographics

The participants in this study were elementary principals in North Park S25 School District (a pseudonym) located in Colorado. North Park S25 School District includes approximately 16,000 students. There are 18 elementary schools in North Park S25 School District, and they are located in a rural and urban community. In North Park S25 School District, principals were expected to evaluate teachers and assume the role of an instructional leader. In regard to the principal's role as the evaluator, the principals responded that they evaluated anywhere from 15 to 29 teachers each year. The teachers they evaluated had various roles in the

building such as kindergarten- through fifth-grade teachers; interventionist teachers; special education teachers; and music, art, and physical education teachers. Each teacher was evaluated using the Colorado Rubric for Evaluating Quality Teachers and measures of student learning. In 2018–2019, elementary-level principal professional development focused on critical thinking. Nine of the participants participated in the critical thinking training. The training occurred once a month, for approximately 5 months. Each training was approximately an hour to two in length. The professional development was focused on principals' understanding of the definition of critical thinking and how critical thinking is evident in teacher practices. Professional development was provided by the North Park S25 School District Director of Assessment and the Directors of Elementary Education.

In this study, all participants were sitting elementary principals in North Park S25 School District. The number of years in North Park S25 School District, the number of years as the current building principal, and the participant pseudonym are captured in Table 4. The participants' range of years in North Park S25 School District were 1 to 30. The range of years the participants had been a building principal in North Park S25 School District was 1 to 9.

The participants in this study had a wide range of experiences and backgrounds including serving as elementary school teacher, middle and high school teacher, bilingual program teacher, interventionist teacher, special educator, gifted and talented and English language development program teachers, instructional coach, high school coach, assistant principal, principal, and district level administrator. These participants had professional experience from many different regions, states, districts, and schools. Additionally, the participants' experiences varied from working in non-Title I and Title I schools. Experience as a building principal ranged from 1 year to 19 years.

Table 4

Participant Pseudonyms and Leadership Information

Pseudonym	North Park S25 School District (Years in)	Current building principal (Years as)
Dorothy	3	2
Shamus	6	6
Vanessa	13	9
Jeff	7	7
Linda	9	5
Cristina	14	1
Lily	2	2
Ann	1	1
Hal	7	7
Doyle	9	9
Stephanie	30	7
Jacy	10	8

Meet the Participants

Confidentiality is important in the research process; therefore, for the purpose of providing confidentiality and protecting participants, each participant self-selected a pseudonym. Choosing a pseudonym was a great ice breaker for participants as well. They enjoyed this

process and making connections with their new "identity." To further elaborate on each principal's background, a brief synopsis is shared below alongside their chosen pseudonym.

Dorothy

Dorothy taught first through fifth grade and was an educator in multiple states. She had been in the North Park S25 School District for three years. She had been the principal at her current school for 2 years. Over her career, she had served as a principal for 4 years, with an additional year as an assistant principal. She also worked for a nonprofit agency focused on professional development for educators. Dorothy's critical thinking training was connected to the professional development model she incorporated into schools.

Shamus

Shamus had a background of teaching third and fifth grade. He had also been in an instructional coach role. His leadership experience included serving as an assistant principal at both the middle and high school levels in a different district. He had served as a principal at his school in North Park S25 School District for 6 years. Shamus participated in the North Park S25 School District collaborative work on educator effectiveness and interrater reliability a couple of years ago. Other than the North Park S25 School District training on critical thinking, Shamus did not mention any other critical thinking training he has participated in.

Vanessa

Vanessa brought a secondary background to her role as an elementary principal. Her past teaching experiences included teaching high school and middle school Spanish, teaching a high school elective titled World Cultures, and being an English language development teacher. Vanessa's building leadership experience included being an assistant principal at two different schools. She had been the principal at her school in North Park S25 School District for 9 years.

Training related to critical thinking occurred when Vanessa was in her English language development teacher role, and it was brief and informal.

Jeff

Jeff began his career in education as an elementary teacher in southern California. He later transitioned to an assistant principal role. When moving to Colorado, Jeff taught middle school and then served as an assistant principal for 4 years. He had been an elementary principal in Colorado since 2007. He had been in his current building assignment as the principal for 7 years in the North Park S25 School District. Jeff shared that he had not received any specialized training in critical thinking.

Linda

Linda was a teacher for 6 years and an instructional coach for 3 years. She began her leadership journey as an assistant principal for 1 year, and had been a principal for 9 years. Linda had been a principal in North Park S25 School District for these past 9 years and had been in her current building assignment for 5 years. Linda expressed that she had not received much formal critical thinking training.

Cristina

With a longer career in education, Cristina was in her 24th year. She had had many roles throughout her career: bilingual teacher, instructional coach, and interventionist. Cristina had most of her educational career in leadership assignments that were at the building level as a principal and as a district administrator. Cristina had been in North Park S25 School District for 14 years and had been in her current building assignment for a little over a year. Cristina's background in critical thinking included an introduction course with Dr. Richard Paul, Dr. Linda Elder, and Dr. Paul Bankes.

Lily

Lily had been an educator in multiple districts in the state. In her roles prior to her current building principalship, Lily taught kindergarten through sixth grade, she was a high school guest teacher in life studies, and a college educator. She had worked extensively to provide quality professional development to educators. Lily had served as an elementary principal for 14 years, and she was in year 2 at her school in North Park S25 School District. In Lily's educational journey, she had received both a teacher of the year award and principal of the year award. Her critical thinking training included Mentoring Minds, a University of Phoenix critical thinking class, and other district professional development.

Ann

An educator for 10 years, Ann had been a principal at her school in North Park S25 School District for 2 years. Her past experiences included teaching fourth and fifth grade, being an instructional coach, and being an assistant principal at a Title I school. Ann had participated in Depths of Knowledge, Buck Institute training, and other district level professional development focused on critical thinking.

Hal

Hal had served in many capacities in education. He had been a first and fifth grade teacher, special education teacher, and had spent 16 years in administration. Currently, he had been a building leader at his school in North Park S25 School District for 7 years. Past experiences related to critical thinking related to scientific research in college and brief professional development opportunities.

Doyle

Doyle's educational background included working in multiple school districts in numerous roles. He had served as a fourth- and fifth-grade teacher, a gifted and talented teacher, and a high school coach for 4 years. Regarding leadership roles, Doyle was an assistant principal for 3 years in a different district than North Park S25 School District. He had been a principal at his school for 9 years. In terms of critical thinking training, this had been limited. Other training focused on Sheltered Instruction Observation Protocol training, higher order thinking skills, and teacher questioning skills.

Stephanie

Stephanie brought a plethora of experience to her role as a building leader. Formerly, Stephanie taught second through fifth grade, special education, and multi-age classes. She looped as a primary teacher and was an instructional coach and a district literacy teacher on special assignment for 2 years. Beyond her years as a teacher and coach, Stephanie had been a Title I principal for 7 years in North Park S25 School District. Stephanie, like Cristina, participated in an intensive introductory training with the Foundation for Critical Thinking. She also received critical thinking training when she was a gifted and talented teacher.

Jacy

For 14 years, Jacy was in numerous roles as an educator. Jacy was a kindergarten, second, fourth, and fifth-grade teacher. She also taught English language development, gifted and talented, and intervention. Jacy's leadership roles spanned from being a response to intervention coordinator, an English language development administrator, and a building principal. She had been the building principal for 8 years in North Park S25 School District. Past experiences with critical thinking included utilizing Socratic seminars and rigor and relevance

frameworks with students. Other trainings included professional development provided by the district.

Participants' Critical Thinking Training

In this inquiry, the participants were asked, "What is your background and experience in critical thinking, if any?" Responses by the majority of the participants included professional development time to collaborate around educator effectiveness and interrater reliability in relation to observing teachers implement practices that promote critical thinking while in North Park S25 School District. Beyond the training in North Park S25 School District, participants shared a wide range of responses in relation to their background and experience in critical thinking. Some participants referenced receiving training from the Public Education and Business Coalition (PEBC), Thinking Strategies Lab Classrooms, Foundation for Critical Thinking, Buck Institute or Relay Graduate program, and about Depths of Knowledge or the Rigor and Relevance frameworks. Other participants mentioned training related to the Sheltered Instruction Observation Protocol related to higher order thinking skills and teacher questioning, professional articles, and attending a critical thinking class at the University of Phoenix. While a handful of participants shared the aforementioned trainings, more than half of the participants shared that they had little to no background and/or experience in critical thinking.

While participant training for critical thinking was sparse, participants indicated that they highly valued critical thinking. Collectively, there was a strong focus on the role teachers have in teaching students how to think, rather than what to think. When participants were probed to explain their position regarding teachers expressing not having time to teach critical thinking, responses were charged. "It's nonsense!" Stephanie remarked. "Balderdash!" gruffed Shamus. "We have to stop thinking of it as an event and rather it becomes a part of what we do and how

we do it," Linda commented. Jacy rhetorically stated, "Why would you be teaching without fostering critical thinking?" Principals alike were adamant that critical thinking should be embedded in all we do as educators. The emphasis on critical thinking was clear: Critical thinking is a must for teachers to teach and students to learn. An unwavering commitment to idea of teaching critical thinking was apparent, and yet Ann said, "I think it is something we say a lot of, but that we don't necessarily honor as something we hold true." Other participants expressed similar sentiments. Overall, the participants in this study from North Park S25 School District have a variety of experiences and backgrounds in education. The participants shared a general passion for education and highly value critical thinking.

Principals' Definition of Critical Thinking

To better understand the inquiry related to how participants define critical thinking, principals in North Park S25 School District were asked to share their definitions of critical thinking. These definitions included a variety of ideas and concepts based on their backgrounds, prior learning, and personal experiences with critical thinking. The following three themes emerged and are illustrated in Table 5: (a) critical thinking has many interpretations, (b) critical thinking includes a wide variety of skills, and (c) critical thinking is embedded in education programs.

Theme One: Critical Thinking has Many Interpretations

Each participant conceived of critical thinking in many different ways. Participants' interpretations of critical thinking connected the importance of prior knowledge to generating new ideas; other participants highlighted independent thought as critical thinking, and some participants named critical thinking as a continuum of thinking skills. The participants treaded lightly as they began to share their thinking and vulnerability around critical thinking.

Table 5

Principals' Definition of Critical Thinking: Themes and Subthemes

Theme	Subtheme
Critical thinking has many interpretations	
Critical thinking includes a wide variety of skills	
Critical thinking is embedded in education programs	Curriculum supported Science, Technology, Engineering, and Mathematics (STEM); International Baccalaureate units of study; Calkins (workshop model of teaching and learning)
	Applying training (habits of discussion, Public Education and Business Coalition training) to classrooms
	Tools for applying critical thinking (Bloom's Taxonomy, Mindware Wheel, Elder and Paul Wheel of Thought, Math Practice Standards)
	Instructional strategies or approaches (design thinking, problem-based learning, Socratic Seminar)

Interpretations of critical thinking varied from the use of prior knowledge to the construction of new ideas, as illustrated by Shamus and Vanessa. Shamus stated, "critical thinking is the use of prior knowledge or new learning and then applying the prior knowledge or new learning to make a judgment or a decision on something using those tools." Vanessa referred to critical thinking as the skill of "not just thinking deeply about a concept, but being able to make new meaning and/or construct new ideas." Participant interpretations were shaped by their experiences with critical thinking.

Other participants, like Ann, Dorothy, and Doyle, focused on students being able to think for themselves. Ann expressed that critical thinking is the notion of "fostering some independent thought," especially in children. Dorothy echoed Ann's idea when she stated, "it's more about not teaching kids what to think, but how to think for themselves." The idea of students being able to reason for themselves was presented with Doyle's question for student reflection: "Can I reason through a situation?" Focused on the student's ability to critically think through information, Jeff shared, "critical thinking is one's ability to both accumulate and then wade through lots of different types and sources of information to get the closest to the essence of what might be called truth in a situation." Cristina expressed that, "critical thinking is the ability to think critically about any type of topic that comes your way." Critical thinking is interpreted as independent thought and the ability to reason through information in order to seek the truth by this group of participants.

Less about a specific skill, Dorothy and Lily both mentioned that critical thinking has a continuum. Lily shared that within critical thinking, "there is a continuum of inferences and there is a continuum of how you engage in problem solving." Dorothy elaborated by sharing how individuals use different types of thinking in different types of settings. For example, changing a tire versus writing a school unified improvement plan are very different processes and types of critical thinking. In changing a tire, Dorothy stated that this process is "instantaneous," and it is necessary to ask, "what information do I have?" Whereas in the process of writing a school unified improvement plan, according to Dorothy, "I have some time … and I have some resources" to think through the task at hand. The critical thinking skills that are needed are "different in each situation" due to the sense of urgency, expressed Dorothy.

Each of the participants shared definitions of critical thinking that represent different components of critical thinking, and yet most of the participants expressed uneasiness as they responded. The uneasiness existed because the responses never seemed to quite fulfill their expectation of what critical thinking truly is. Vanessa shared how stating the definition of critical thinking was challenging, and that she was doing the best she could. Doyle echoed Vanessa's struggle in defining critical thinking. "Wow, I don't know that I've ever put that [definition of critical thinking] in words. It took me a second," shared Doyle. Hal stated that he had to explain critical thinking in many different ways, "because it is nebulous … and there's no one right answer for it." Vanessa further expressed the need for a "unified understanding or definition of what it [critical thinking] is, what it [critical thinking] entails, and how to teach it [critical thinking]." Dorothy conveyed a strong desire for educators to "foster a common definition [of critical thinking] … to have a common understanding [of critical thinking]." They concluded their thoughts with statements like, "sure, let's leave it at that," and "it's a slippery thing to define, truthfully." When participants were asked to revisit the definition of critical thinking, most participants were content with their initial definitions and chose not to elaborate on the definition. Beyond these initial definitions and trepidations around critical thinking, the participants identified critical thinking more readily by naming a plethora of skills that students exhibit as elaborated on in the second theme.

Theme Two: Critical Thinking Includes a Wide Variety of Skills

The definition of critical thinking includes a compilation of skills that were widely expressed amongst the participants. Critical thinking skills identified in the participant definitions included analysis; inferences; evaluation; problem solving; entertaining and seeking

out points of view; deep understanding of concepts; asking questions; gathering reliable information, facts, and data; the use of prediction; reflection; and expressing empathy. Though the list is lengthy, each participant highlighted specific skills.

Hal simply stated that critical thinking is the ability to "analyze, evaluate, and create." Doyle expanded the list of critical thinking skills to include, "the idea of analysis, inference or inferring, and evaluating." Stephanie emphasized "implications and consequences" as critical thinking skills. Cristina expressed that, "for example, whether students are problem solving or going through a deeper process than just answering a question" they are using critical thinking skills. Linda shared that at her school, teachers are leveraging critical thinking skills when they "encourage students to think about their perspective, but be active listeners so they can either agree or disagree, and build upon ideas from other students in the class." Dorothy expressed the importance of multiple critical thinking skills in this example:

> Critical thinking is where an individual, no matter the age, no matter the person, can get some information. That person can analyze the information and decipher the information based on experiences and based on knowledge, which are two different things. From this process, the person can make an assumption and/or speak to the information.

Lily added to the list of skills and stated that, "prediction is the beginning of teaching critical thinking." Lily also shared about the importance of reflection by explaining that, "reflection is a type of critical thinking. So, helping people learn to reflect or engage in reflection can … help them go deeper" into their thinking. According to Ann, "Critical thinking is about, at some level, being able to step out and walk in somebody else's shoes for a second." Ann continued by emphasizing the importance of empathy and how it is essential to "be able to say, okay … I do not see it that way" when we are engaging with others.

Furthermore, Ann more broadly stated, “critical thinking stems from that seeking to understand lens.” The wide variety of skills can be used to do just that. Cristina elaborated on understanding others’ “perspectives.” The ability to understand other perspectives, according to Cristina, was the

> ability to take all the information and synthesize it to come up with what you believe. This is done after you’ve heard all of the sides of the story to come up with what you believe versus what you have been told. This is something that is important right now and it would be timely.

Cristina further elaborated “that being able to look at things from different angles, being able to empathize” is key to being a critical thinker. Supporting the skills of being a critical thinker, Stephanie added that “analyzing analytical arguments, assumptions, personal history, and biases” are also key. Jeff emphasized an additional valuable skill in critical thinking: “Flexibility in thinking—the first answer may not be the right answer.” The participants identified the many skills that are needed to be a critical thinker.

Theme Three: Critical Thinking is Embedded in Education Programs

In relation to the definition of critical thinking, during the semi-structured interviews participants briefly highlighted numerous programs, curriculums, and instructional design models connected to critical thinking that are referenced in the educational setting. A few of the educational resources and/or programming participants shared included the following: International Baccalaureate, the Paul and Elder method, and project-based learning. These resources and/or programming are further explored under the following subthemes: (a)

curriculum supported, (b) applying training to classrooms, (c) tools for applying critical thinking, and (d) instructional strategies or approaches.

Curriculum Supported

Units of Study

Critical thinking is embedded in curriculum supported units of study, specifically STEM, International Baccalaureate, and the Calkins Workshop model according to some of the participants. Cristina spoke to the STEM units of study in her building that "allows opportunities for students to come up with a variety of pathways and thought processes" in searching for answers to inquiry-based questions. Cristina elaborated on the STEM units by emphasizing that when learning can "provide students different opportunities and ways to experiment and explore … to come up with their own answer, not letting them think that there is just one answer" is when we have critical thinking happening in our school.

This focus on inquiry was also similar in another building that focused on International Baccalaureate inquiry-based units of study. "Group work can be an avenue or a mechanism for critical thinking" and it supports the International Baccalaureate focus on "fostering inquiry" shared Jeff. Jeff further elaborated, "if you are working hard on inquiry, there is a really good chance that you are also working on some critical thinking skills." Jeff shared the students worked on different tasks and challenges, and these experiences were inquiry based.

Doyle connected critical thinking to the Lucy Calkin's Workshop model. In the workshop model students "have an opportunity to share their writing and then to receive both peer and teacher feedback on their writing." Doyle expressed how "critical thinking" is evident in this model in "two ways." The way in which students "receive feedback" and then "apply the feedback" to improve their writing are the two ways critical thinking exists in this model. The role of "conferencing" with the student is also key for providing "clear feedback," noted Doyle.

Whether receiving feedback or questioning a picture in a picture book to later generate writing, Doyle shared with certainty that "students are taking in information, receiving the information, and then producing something based on what they have received," which is part of being a critical thinker. Critical thinking connections, according to Cristina, Jeff, and Doyle, were evident in the mentioned units of study.

Applying Critical Thinking Training to Classrooms

The implementation of new critical thinking learning and training into classroom settings was evident in Linda and Dorothy's experiences. Linda shared that in her building they refer to their critical thinking processes as "habits of discussion." The habits of discussion were a strategy that Linda has learned in her Title I leadership trainings as a strategy to support critical thinking. These habits of discussion give students the opportunity to "build upon ideas from other students" and to be "actively engaged listeners." Linda expressed that the teachers and students use specific cues in the classroom to help increase engagement and to promote habits of discussion. Additionally, Linda shared that "teachers are very specific with the questions they are choosing to guide the learning and experience in their classroom." Critical thinking was directly connected to habits of discussion in Linda's school.

Dorothy shared how the PEBC program helped to support a focus on teacher professional development and supporting students in "analyzing what my own thinking is doing for me." The work of PEBC on teaching thinking strategies, according to Dorothy, recognized that "you cannot teach students everything ... all the content" but rather, teachers can focus on teaching students how to "analyze their own thinking" to become critical thinkers. The explicit connection between habits of discussion and PEBC training to promote critical thinking in the classroom was evidenced by Linda and Dorothy's examples. Additionally, the Depths of Knowledge and

Rigor and Relevance frameworks were mentioned by the participants with no elaboration to exemplify the connection to critical thinking.

Tools for Applying Critical Thinking

The application of critical thinking skills was enhanced, according to the participants, with learning tools such as Bloom's Taxonomy (Bloom et al., 1984), Mindware Wheel, Elder and Paul Wheel of Thought (Elder & Paul, 2018), and Math Practice Standards (Burns, 2012). During the interviews, participants referred to higher order thinking skills as critical thinking skills, and Bloom's Taxonomy was briefly mentioned. Cristina stated that critical thinking was evident when she "could see students answering higher order questions and responding from different angles." Hal shared that "when I think of critical thinking, I am thinking of high-level Bloom's … anything above the idea of applying knowledge would be critical thinking." Jacy also noted that Bloom's was a way to help students "move beyond level one" to get to a deeper level of thinking. Lily mentioned a critical thinking tool called Mindware. This was a company that Lily recalled was a critical thinking resource because they designed a "little wheel that talks about all of the different types of critical thinking" and was used as an instructional tool.

Another critical thinking program mentioned by participants was the Paul and Elder method. Cristina, having been trained in the Paul and Elder method, expressed that "the Wheel of Thought that you can use to help support your thinking" is easy to embed within content. Stephanie also shared how she received formal training in the Paul and Elder method. Stephanie elaborated on the implementation of critical thinking practices in the classroom by teaching about "fair-minded thinking, implications, consequences, and by providing a structured introduction of concepts and language for students." Stephanie further shared that this critical thinking instruction was "done in a very natural and organic way by having conversations with

students that were natural." Stephanie's attendance at multiple Paul and Elder trainings helped make connections with critical thinking and Math Practice Standards.

According to Stephanie:

> I see Math Practice Standards as being critical thinking. It is looking for those big picture connections, those more important, essential ideas that ground the work of a mathematician. This thinking goes beyond a single problem. So, I saw them fitting very well with the critical thinking training that I had previously.

Jacy echoed Stephanie's critical thinking connection to Math Practice Standards. Jacy elaborated on students' engagement in math and "how they solve a problem." "They are really deconstructing their thinking around what steps they took and how they apply their knowledge. There is a lot of explanation around how the math problem could be used or what the meaning of the problem was," shared Jacy as she elaborated on Math Practice Standards. Doyle also echoed the sentiment that "critical thinking in math would be [about] can I take a problem and be able to apply it?" to the real world. The educational tools of Bloom's Taxonomy (Bloom et al., 1984), higher order thinking, the Mindware Wheel, the Paul and Elder Wheel of Thought (Elder & Paul, 2018), and the Math Practice Standards (Burns, 2012) each play a unique role in supporting students as critical thinkers.

Instructional Strategies or Approaches

Other instructional strategies related to critical thinking included Stanford Design Thinking, project-based learning, and Socratic Seminar. The Stanford Design Thinking process, according to Lily, supports critical thinking by teaching students to use "a process to solve a problem, but it takes a lot of critical thinking. It takes observation, it takes feedback, it takes

making inferences, it takes reflection." The instructional strategies included multiple steps to supporting students becoming critical thinkers.

Jeff elaborated on the connection of critical thinking to design thinking instructional approaches with some classroom examples. In Jeff's school one group of students were using design thinking and project-based learning to examine a water shortage in Africa. The students were "tasked with creating a water filter based on limited materials." The students used materials to simulate the process. Students focused on how to "take out large sediment, then finer sediment" and so forth to produce clean water. Another grade level "had to design a shoe for a particular person they knew based on what they knew about the person" according to Jeff. For this project, students also went "through a design cycle" to design the shoe, shared Jeff. "All of those projects required what I would say are critical thinking skills around creativity, design thinking, group work, experimentation, prototyping, and those types of things" Jeff expressed in reflecting on the connection of critical thinking to project-based learning and design thinking.

In relation to critical thinking, Ann stated, "I see a little bit more of that in my school now that we are doing project-based learning." A kindergarten teacher, despite the pandemic and students learning remotely, was compelled to support the students' inquiry about the local fires. The teacher, according to Ann, promoted a high "level of questioning," which encouraged students to "start thinking deeper" about the inquiry through project-based learning.

Lastly, the Socratic Seminar was a method mentioned to promote critical thinking. According to Hal, the teacher will set up "structures" to support the Socratic process. When the processes are in place, Hal shared that it is evident that "deep thinking had gone into what the students were saying." Resources related to critical thinking are widespread in education;

although, only a few participants elaborated on any given instructional strategy, and each participant shared their unique experiences in relation to critical thinking.

Principals' Identification of Critical Thinking in Teacher Practices

The participants in this study used the CSMES to evaluate teachers. To understand how principals identify critical thinking in teacher practices, participants shared their considerations when identifying critical thinking in teacher practices. The participants' responses included examples of teachers fostering critical thinking in students. Through the data analysis process, the following two themes emerged and are illustrated in Table 6: (a) principals identify critical thinking through student engagement, and (b) principals identify critical thinking through the teacher's intentional design of instruction and learning.

Table 6

Principals' Identification of Critical Thinking in Teacher Practices: Two Themes

Theme	Definition
Principals identify critical thinking through student engagement.	Students are actively engaged in their learning.
Principals identify critical thinking through the teacher's intentional design of instruction and teaching.	Teachers utilize numerous teaching methods to intentionally plan to teach critical thinking.

Theme One: Principals Identify Critical Thinking Through Student Engagement

The goal, after all, according to the participants in this study, was for students to be actively engaged in their learning. Through the interviews, it was clear that the participants' primary goal as principals was to support students in their learning. Participants considered the types of student engagement that support the development of students as critical thinkers. There were four teacher practice subthemes emphasized as illustrated in Table 7: (a) promoting more student-talk than teacher-talk, (b) leveraging teacher and student questioning, (c) encouraging students to take command of their thinking, and (d) fostering a culture of thinking.

Table 7

Principals Identify Critical Thinking Through Student Engagement: Four Teacher Practices Subthemes

Teacher practices subtheme	Definition
Promoting more student-talk than teacher-talk	Students articulate and express their learning, rather than teachers throughout the day.
Leveraging teacher and student questioning	Teachers utilize questioning strategies to encourage students to engage with each other.
Encouraging students to take command of their thinking	Teachers teach students how to dissect their own quality of thinking and the thinking of others.
Fostering a culture of thinking	Teachers promote a safe culture and climate where students can engage with their thinking and the thinking of others.

Promoting More Student-Talk Than Teacher-Talk

Key to positive student engagement was the desire for the classroom to reflect less teacher-talk and more student-talk. Structures to support an increase in student-talk included habits of discussion, purposeful groupwork, and an overall inclusion of student voice in the learning environment. “If the teacher is talking, the teacher is doing the learning. If the students are talking, the students are the doing the learning,” Ann stated. Ann used the balance of teacher-talk versus student-talk as a guide for observing critical thinking teacher practices. She shared that when observing in a classroom she is “listening to the types of questions that are being asked in the class and then [she is] listening to who is doing the talking” when noting teacher practices that promote critical thinking.

Linda shared how habits of discussion promoted student-talk. Linda emphasized, the “main purpose is to minimize teacher discussion and increase student accountability in relation to their thinking and creative thoughts as a class community.” Students, according to Linda, were encouraged to “think about their perspectives” while being “active listeners” in order to “agree or disagree” with their peers. Linda further stated that habits of discussion really get the students to “think critically, and it gives the students permission to disagree with something you hear somebody else saying.” For example, when habits of discussion are implemented, the teachers “stay out of the discussion and it is really up to the students to be actively leading that discourse and thinking critically about their ideas” for ideal student-talk, according to Linda. From Stephanie’s perspective, one of the strongest ways to promote student engagement was by having the students take an active role in “discussion and conversation because then the students are actually turning on their brain.” When there is not “a lot of teacher-talk,” critical thinking is most evident, stated Hal.

According to Jeff, another way student-talk is encouraged is through "well-structured group work where all students have a chance to share their thinking." Jeff also shared that when there is well-structured group work, the student voices are "valued. .... Well, not just valued, but really considered. It lets students have an opportunity to be open to changing their mind." The notion of changing your mind, Jeff emphasized, is a skill that is difficult, not just for students, but for people in general. Jeff further elaborated that encouraging student voice, minimizing teacher voice, and practicing the skill of flexibility in one's thinking are all "things that lead toward critical thinking skills" in the classroom.

When Vanessa reflected on student engagement and the classroom learning environment, the first question that came to her mind was, "Who is doing most of the thinking in classroom?" In other words, as the learning was progressing, was the teacher responding more to the questions or were the students responding more? Vanessa expressed that when students were speaking, she was listening to "how deeply they are thinking" and noting the "kind of thinking" the students were engaged in. Shamus added that during number talks, when students are talking through their mathematic thinking, it was critical that the teachers give students time to express their learning. When number talks in mathematics take place, "I get to hear, the students get to hear, and the teacher gets to hear some incredible thinking" related to "how numbers work together," directly from the students rather than the teacher, shared Shamus. Vanessa, Shamus, and Dorothy emphasized that the higher level of student engagement and meaningful conversations provided, the more opportunities for students to engage in thinking deeply about their learning.

Leveraging Teacher and Student Questioning

"These kids, all kids, can really have discourse!" Dorothy celebrated as she shared an example of student engagement where first grade students, with the teacher facilitating, engaged in comprehending a high-level nursery rhyme text through quality teacher and student questioning. The questioning strategies focused on increasing student engagement by encouraging students to question one another about their learning. Questioning strategies, according to Dorothy, included targeted whole-class talk time, scaffolded lessons over time to comprehend the text, and time for students to talk about the text and question with peers. Each strategy encouraged students to engage in speaking, listening, and questioning their peers about each other's learning. Critical thinking was more likely to occur when students were cognitively engaged in this way.

One way to increase questioning is through Socratic Seminars. Jacy expressed excitement about a fifth-grade teacher who leads Socratic Seminars with students who are in the dual language program:

> [The] level of questioning with the students, the students working in groups trying to apply their knowledge, but in another language, when it is typically not their first language, I mean ... they are really having to think in a different, more complex way.

Hal also highlighted Socratic Seminars as a way to see students engaged in critical thinking. The Socratic process not only challenges the students' language abilities and discourse skills, but it also provides an opportunity for students to apply their learning to the lesson or to their life.

Additionally, student questioning skills can be increased through intentional teacher questioning. According to Doyle, a classroom rich with questioning and thinking is one that evaluators are "constantly looking for." Doyle stressed that teachers need to construct higher-

order questions and tasks “that require higher-level thinking.” Stephanie highlighted that in a classroom where questioning is evident, “student thinking is valued” and teachers “encourage deep thinking.” Deep thinking, or critical thinking, according to Stephanie, involves authentic “questions that provoke students to think differently” about a topic they were learning about. A question-rich environment gave students opportunities for meaningful think time, not just stagnant wait time.

Ann emphasized quality questioning, elaborating that “it’s how to ask the right questions [as the teacher], and how to teach students to ask the right questions.” Ann further noted that it is important to teach students that it is “okay to not have a right answer.” “I think if you ask the right questions, it leads students to think in a different way,” Dorothy stated, and then elaborated that “it is about those open-ended questions.” “Repetitive call and answer,” while a type of discourse does not increase student engagement, according to Dorothy. Furthermore, “Very rarely is a single question at critical thinking depth,” stated Stephanie. In questioning students, the prompts should surpass the typical who, what, where, when, why, and how, and rather, focus on “reasoning and justifying your reasoning,” shared Stephanie. According to Dorothy, teachers who asked questions and allow multiple students to respond in many different ways also encourage students to identify misconceptions in their own learning. Empowering students to ask questions was key for developing critical thinkers, according to Shamus. Students’ critical thinking skills were fostered when teachers explicitly utilize multiple modes of questioning as a teaching tool and then probe for deeper learning.

Encouraging Students to Take Command of Their Thinking

When students can take command of their thinking, in other words, students can “reason through their thinking” with scaffolded prompting and support from the teacher, then they have

the “ability to reason logically,” according to Doyle. Doyle continued by expanding on how “real-world” learning scenarios allow “students to think through solutions and to do some of that learning on their own.” Stephanie stated that the student’s ability to take command of their thinking was enhanced when teacher practices include the task of analyzing arguments, digging into assumptions, and digging into “our own history and our own biases and our own things that we see and the things we don’t see, and helping students to be aware of that. That is the foundation for being a critical thinker.” Stephanie emphasized that for teacher practices to support students taking control of their thinking, “it really is about classroom structures and routines that allow students to think deeply and share their thinking with each other. And the teacher and students are free to ask questions that help students continue to grow in their thinking.” In a classroom environment that allowed students to engage in their thinking, according to Stephanie, students were supported in taking an active role in their learning.

Jeff shared a classroom example of students being tasked to design a shoe for a particular person they knew. Throughout the task, “the outcome is way less impressive than the process … the process is key” explained Jeff. Jeff emphasized that the process is where students take ownership of their thinking and ultimately their learning. Jeff proudly stated, “the power is in the process and that the thinking skills that go into it.” Shamus echoed Jeff’s sentiments on the value of the process of thinking. Shamus placed a high valued on the role the student plays in taking command of their ability to think critically. “When students authentically listen to one another and evaluate what their peer is saying,” according to Shamus, “that is pretty cool!” In other words, the student is an active participant in their learning as they engage as a critical thinker.

Fostering a Culture of Thinking

In order to increase student engagement utilizing critical thinking practices, a safe culture and climate must be fostered in the classroom. A culture of thinking promotes increased student engagement when students are "analyzing someone else's reasoning and asking questions that help them when they are confused or misunderstand," but all this is done "from a very healthy, safe place," according to Stephanie. Ann echoed the idea that in order for students to be engaged, respect between students is key to leveraging critical thinking. The teacher, according to Ann, was setting up a culture of thinking that fostered independent student thinking and not the "right or wrong answer," but rather, a greater understanding of the why. "You won't ever have good critical thinking in a room that does not feel safe," stated Stephanie. "Fear of judgement," stated Shamus, "will stunt thinking every time." For all students to be engaged, it was key that they have their voice represented in the classroom, regardless of their content skill level. Stephanie emphasized this idea by sharing that "the classroom community changes when everyone contributes to the thinking." All voices are valued. "Create a culture—that is the work," stated Jeff. "To build a classroom community where thinking is valued is probably the first critical thinking skill you have to build. It is an essential groundwork piece," Stephanie explained. Stephanie further elaborated on the classroom community that fosters critical thinking:

> When you set up a classroom community where every voice is heard and every voice has significance and meaning, you create a safe space for kids to take risks with their thinking. You have students who will agree and disagree respectfully.

Establishing an environment that encapsulates critical thinking is a dynamic classroom community, filled with students engaged in learning and where "people think beyond themselves," Stephanie shared. Stephanie described a kindergarten classroom where the first step

to establishing a culture of thinking is “teaching about fair-minded thinking.” Stephanie explained that this teacher created a rich culture of thinking through “the language she uses with students. And she teaches concepts, not just words, so that idea that words connect together requires a deeper level of thinking.” The concepts and critical vocabulary explored are intentionally tied into the class read-alouds and overall content. Beyond the infusion of language concepts, Stephanie explained that kindergartners practice “critical thinking daily.”

Additionally, Stephanie described a fourth-grade teacher who also encourages student engagement by establishing a culture of thinking. Both teachers exemplified the need for a culture of thinking to support students in their reasoning skills and provide a safe environment where, as Stephanie stated, students can “identify when you are mis-thinking or that your reasoning is no longer sound” and still be valued as a thinker. The culture of thinking was designed to promote a safe space during content learning, social/emotional learning, morning meetings, and all areas and environments that students engage in during a school day to be a critical thinker.

Theme Two: Principals Identify Critical Thinking Through the Teacher’s Intentional Design of Instruction and Teaching

The role of intentional planning is key for teachers to provide quality instruction and optimal learning experiences for students. Participants shared a deep passion for quality instructional design. In developing students’ critical thinking skills with intentionality, the following three teacher practices are expanded as subthemes in this section and illustrated in Table 8: (a) planning for thinking routines, (b) balance of prescribed core curriculum instruction and critical thinking instruction, and (c) relevance of learning.

Table 8

Principals Identify Critical Thinking Through the Teachers' Intentional Design of Instruction and Teaching: Three Teacher Practices Subthemes

Teacher practices subtheme	Definition
Planning for thinking routines	Teachers incorporate thinking routines that are specifically designed for students to engage in their thinking and the thinking of others.
Balance of prescribed core curriculum instruction and critical thinking instruction	Teachers design lesson plans using the prescribed core curriculum and critical thinking outcomes.
Relevance of learning	Teachers implement real-world learning opportunities to promote students' application of critical thinking beyond content learning into real-life application.

Planning for Thinking Routines

Like any routine and structure in a classroom, thinking routines need to be explicitly taught. According to the participants, the process of planning for student outcomes, teaching clear expectations, modeling thinking processes, and emphasizing the process of thinking versus the product were all essential in planning for thinking routines. A thinking routine is a routine that is specific to students engaging in their thinking and the thinking of others. Vanessa reflected that in planning for critical thinking, "teachers have to be able to think about where they want to take the students and where it is going," and in the process, be prepared "for students to deviate" from the goal. Vanessa further shared that the key is establishing the steps to meeting a learning goal and supporting students in knowing how to develop the skills to meet the goal. Stephanie, Linda, Lily, and Vanessa articulated the importance of teachers planning for

instruction. Specifically, the preparation that is needed to "intentionally teach critical thinking to their kids," according to Stephanie, cannot be underemphasized. This is not to be confused with scripting every moment out; rather, Shamus shared that the learning environment should reflect "authenticity" and sparks of student thinking "integrating music and art" as organic components in the process of learning.

Teachers need to clearly teach expectations when setting up thinking routines. Linda shared that with clear guidelines, students can predict the thinking routine, and the level of student engagement increases as well. For example, Linda shared students engage with other students by using "hand signals" to "agree, disagree, or build upon someone else's thinking" during their habits of discussion, a thinking routine. According to Jacy, when a thinking routine is expected it becomes "a part of the teacher's classroom instruction." With predictability, "students gain more confidence" in the thinking routine, according to Linda, which leaves more space for them to focus on their thinking skills.

Planning for instructional thinking routines in the classroom was perceived by participants as essential for teaching students the skills to be critical thinkers. According to Jeff, one of the key elements to building thinking routines was the process of modeling thinking. "Teachers have to model their own thinking and then let students foster that process too," shared Dorothy. She went on to explain that teacher modeling helps students to know that it is okay to think out loud. The role of modeling, Dorothy elaborated, also supports that one can change their thinking, and that "when we are critically thinking at any given moment, I might think one way, but I have time to think about something more and my thinking can change too." In addition to modeling, planning for the process of learning rather than a product of learning is also key.

Planning for the development of critical thinking skills takes intentional design. Shamus shared that intentionality with thinking routines places a greater emphasis on the process, rather than a product. Jeff echoed focusing on the process and inquiry, rather than an outcome. Jeff stated that teaching for thinking is more than just "thinking as a means to an end" of a learning outcome. To establish a thinking routine, Shamus elaborated, the teacher designs "appropriate questioning and appropriate access points," and with this careful design, the students are able to share "incredible thinking" about the content they are learning. For example, Hal shared that a Socratic Seminar in action can look very seamless and like a well-oiled machine. Hal observed the importance of intentional design and explicit teacher instruction to support students taking ownership and command of their thinking. Well-crafted thinking routines are established through intentional teacher practices, according to participants, and reflected in the culture and climate of the learning environment.

Balance of Prescribed Core Curriculum Instruction and Critical Thinking Instruction

The classroom teacher faces challenges every day regarding how to teach and manage the prescribed core curriculum that is expected. The plethora of prescribed core curriculum resources the school district provides are helpful and also pose a challenge to carving out time for critical thinking instruction. Ann expressed, "that there are opportunities to foster more critical thinking, but you have to be really intentional about planning for those opportunities." Beyond the prescribed core curriculum, Dorothy shared that the reality is "you can't teach them everything, all the content, but you can certainly teach students to analyze their own thinking." "There has to be explicit instruction on how to think," Dorothy stated.

Lily expressed great passion in teachers explicitly teaching students the components of critical thinking and the balance of prescribed core curriculum outcomes that can be achieved with adaptations to lesson design. Teachers who prioritize critical thinking take time to "analyze the [academic] standards" and "shift the lesson" in the prescribed core curriculum, according to Lily, to plan for an explicit, well-taught critical thinking skill(s) rather than an implicit, poorly taught skill. Furthermore, to embed critical thinking into the prescribed core curriculum, Lily emphasized the need to do "curriculum compacting" and to analyze "prerequisite skills." Vanessa shared that it is a balance between "meeting standard expectations" and teaching the skills "that are going to take the students beyond academic success, beyond social success into postsecondary success to be able to contribute to the community." According to Stephanie, teachers ask critical questions about concepts students are learning about, and this explicit process promotes a gentle balance of critical thinking instruction and curriculum related instruction. "If you do the critical thinking up front, if you really help students to distinguish how they can think, you're going to pay the dividends in the end," emphasized Dorothy. Stephanie shared that when critical thinking becomes embedded in the learning environment, rather than prescribed core curriculum guidelines, students become critical thinkers.

Relevance of Learning

Participants stressed the importance of teacher practices that promote an emphasis on learning that is relevant. Relevant learning includes the acquisition of basic skills and applying those skills to real-world learning to become critical thinkers. According to Doyle, "the more relevant you can make it, the more meaningful" the learning becomes. Doyle elaborated,

> The more relevant you can make situations and questions and examples, whether it be with project-based learning or anything that is relevant, the more real-world opportunities

teachers can provide to show students where critical thinking can be applied, the more beneficial.

Lily shared an example of how second grade students tackled a real-world problem at her school related to students not having their coats at recess. The teacher at the time sat the class down and posed the problem of needing coats at recess. “Here’s our problem, how might we make sure that everyone can stay warm at recess?” shared Lily. This open-ended question prompted many more guiding questions according to Lily. Students took on this highly relevant, real-world issue and they engaged in how to solve it, because, as Lily stated, “it was their second-grade issue.” The question at Lily’s school was posed during their community time. Community time is a time for students to connect to each other and to have time to ask real-world questions that are relevant to them.

Cristina also shared an example of how students at her school focused on learning that was relevant to their local community. According to Cristina, a question was posed by the local Chamber of Commerce to the students regarding how to enhance the local recreation center. Cristina expanded on this example as she shared how the recreation center was enhanced by her students’ unit of study that was not only relevant to the local project, but also to the students’ science and social studies standards. Cristina shared how the project has “finally come to fruition,” and it “came out of students taking a problem in their community and coming up with difference solutions, and then presenting those solutions to the Chamber of Commerce.” Jacy emphasized that real-world types of problem-solving allow students to “describe how the solution will impact either the world or the person.” As is evident in Cristina’s Chamber of Commerce example, to provide relevant learning in order to teach critical thinking skills and

yield high level student outcomes, participants also placed an emphasis on the transference of learning.

Amongst participants, the pervasive, upheld skill connected to teaching students to be critical thinkers was the focus on learning that extends beyond the targeted lesson of the day into real-life application and into the transference of learning. According to Doyle, the notion of applying different processes, evaluating the problem, and then determining "which solution makes the most sense" are the steps a critical thinker takes when transferring learning from one content to another. Doyle elaborated on the importance of students' transference of critical thinking skills,

> I think that the ability to analyze, whether it is a text you are reading, whether it is an argument you hear on television, whether it is something you read on social media … the ability to analyze those pieces for truth, for what you believe within that, I think it is huge. I think it starts in elementary school.

Furthermore, the critical thinking skills being taught are designed to apply outside in the real world, beyond the classroom learning environment. Whether at home, navigating a job, or shopping at the grocery store, Dorothy stated, "there is explicit instruction on how to develop thinking skills or strategies … and students need to be taught how to think for themselves," so they can navigate their world.

Teachers can also provide opportunities for students to transfer learning with complex tasks, Doyle shared, that do not have a right or wrong answer, nor are they specific to one content. "The ability to solve problems … not just in the classroom" was important to Doyle. Doyle elaborated, "I am not just talking about math. I am talking about, can the student problem-solve social situations? Can the student problem-solve difficult circumstances at home?" These

skills, according to Doyle need to "be taught as early as possible." These skills taught at early ages, stated Doyle, "look very different in kindergarten, but I absolutely believe that is where it needs to begin. The ability to problem-solve situations, to analyze situations and find the best solution." Ann shared that critical thinking is exemplified when the "wow" factor of students learning a skill in one content area is applied to another content area without teacher guidance. Lily echoed Ann's sentiments, "The most beautiful part is when they start using the critical thinking skill on their own when it is not a teacher-assigned lesson" or targeted learning activity. Teacher practices to promote the transference of critical thinking skills included complex tasks and learning opportunities that allow students to apply their critical thinking skills across domains, disciplines, and environments according to participants.

Summary of Chapter

This chapter opens with a carefully constructed description disclosing the participants' demographics while maintaining confidentiality. The purpose of sharing this information was to bring attention to the numerous leadership roles and experiences the participants had held, the number of years in a principal role, and the number of years at their specific building site in North Park S25 School District. The findings in this chapter revealed three themes central to Research Question Q1 and two themes specific to Research Question Q2. The themes that emerged from the 12 participant interviews and the field journal were specific to the two guiding research questions.

Three themes emerged from Colorado principals' definition of critical thinking. The themes identified included (a) critical thinking has many interpretations, (b) critical thinking includes a wide variety of skills, and (c) critical thinking is embedded in education programs. Theme one focused on the multiple ways in which the participants defined critical thinking.

Theme two identified a plethora of skills that participants reference as critical thinking skills. Theme three captured the many ways in which critical thinking is incorporated into programs and materials in the field of education.

Two themes emerged from the second research question that focused on principals' identification of critical thinking in teacher practices. These two themes included (a) principals identify critical thinking through student engagement and (b) principals identify critical thinking through the teacher's intentional design of instruction and learning. Specifically, theme one, principals identify critical thinking through student engagement, revealed four areas of focus for teacher practices that foster the development of students' critical thinking skills. These four areas included (a) promoting more student-talk than teacher-talk, (b) leveraging teacher and student questioning, (c) encouraging students to take command of their thinking, and (d) fostering a culture of thinking.

Theme two, principals identify critical thinking through the teacher's intentional design of instruction and teaching, highlighted the following: (a) planning for thinking routines, (b) balance of prescribed core curriculum instruction and critical thinking instruction, and (c) relevance of learning as essential teacher practices to foster critical thinking in the classroom. Chapter V will explore the discussion of the findings, recommendations for policy and practice, and recommendations for future research.

CHAPTER V

DISCUSSION OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

Key to education in schools today is student mastery in reading, writing, mathematics, and the development of critical thinking skills (Benjamin et al., 2015; Heick, 2019; Price, 2017; Wagner, 2014). The workforce and business leaders have also placed great emphasis on critical thinking skills in work environments and, therefore, identified critical thinking as an essential competency for students exiting the kindergarten–12 (K–12) educational system (Deloitte Global, 2018; Hart Research Associates, 2018; MindEdge, 2019). While there is great emphasis on students developing critical thinking skills, critical thinking instruction, assessment, and evaluation falls short (Beyer, 1987; Darling-Hammond & Oakes, 2019; Gormley, 2017; National Commission on Teaching and America's Future, 1996). In order to foster teacher practices that develop critical thinking, the principal's role in the improvement of teaching and learning and overall student achievement is vital (Arum & Roksa, 2011; Heick, 2019). With limited research evident in relation to how principals evaluate teachers' effectiveness specific to critical thinking teaching practices (Bergin et al., 2017), the elementary principals in this instrumental case study offered insight into how they defined critical thinking and how they identified the use of critical thinking in teacher practices in the classroom.

Summary of the Findings

Participants from North Park S25 School District engaged in semi-structured interviews that were conducted for up to 1 hour. The following research questions guided this inquiry:

Q1 How do Colorado principals who use the Colorado State Model Evaluation System define critical thinking?

To further explore Colorado principals' conception of critical thinking, a subsequent question followed:

Q2 How do Colorado principals who use the Colorado State Model Evaluation System identify the use of critical thinking in teacher practices in the general education classroom?

Identified in the results of this study are three themes central to Research Question Q1. The three themes include (a) critical thinking has many interpretations, (b) critical thinking includes a wide variety of skills, and (c) critical thinking is embedded in education programs. In regard to Research Question Q2, the results of the study reveal two themes. The themes include (a) principals identify critical thinking through student engagement, and (b) principals identify critical thinking through the teacher's intentional design of instruction and teaching. This chapter will present a thorough discussion of the findings, a conclusion, and recommendations.

Discussion of Findings: Principals' Definition of Critical Thinking

The principals in this study wore many hats in their leadership roles. They managed their brick-and-mortar building needs, supported their students' families, connected with students, built community connections, and had an important role as instructional leaders and teacher evaluators. Given all the hats they wore, their backgrounds, and their varied experiences, the principals' participation in this inquiry on critical thinking was essential to better understand the phenomenon. The findings revealed that each principal's set of experiences, background, and knowledge informed their responses about the definition of critical thinking. For example, Stephanie's former critical training, experiences as a gifted education teacher, and building leader all contributed to her identification of critical thinking in teacher practices. Additionally,

confidence in responding during the interview illuminated areas in which the participant may or may not have felt as comfortable in their answer to the questions and/or topic. The discussion examines these findings more closely.

Critical Thinking has Many Interpretations

The data indicated that critical thinking is interpreted in many ways, and this notion is represented in the literature. A challenge to educators is the task of giving critical thinking one clear, succinct operating definition (Brookfield, 2012). Participants' definitions of critical thinking ranged from the gathering of information to higher order thinking, to seeking out multiple points of view, to the problem-solving process, and the analysis of thinking. Similar to the findings, there are many definitions of critical thinking in the field of education (Pearlman, 2020; Petress, 2004). Pearlman (2020) stated that to parse through the definitions of critical thinking "would become a tediously lengthy affair" (p. 4). Petress (2004) emphasized that domain and context also influence how critical thinking is defined. Principals in this study shared many interpretations of critical thinking and expressed a collective desire for clarity on the definition of critical thinking and how critical thinking is put into teacher practices. This need for clarity was echoed in Lipman's (1988) sentiments regarding schools teaching critical thinking. For critical thinking to be taught, according to Lipman, the term critical thinking must be defined. Paul (2010) noted that it is important to focus on the critical features of what it means to be a critical thinker.

Critical Thinking Includes a Wide Variety of Skills

The second finding in relation to the principal's definition of critical thinking revealed that principals identified numerous skills related to critical thinking. The principals' list of

critical thinking skills coincides with the skills heavily represented in the literature. Principals listed skills that included analyzing, evaluating, inferring, and taking on multiple points of view. Dorothy stated, “It’s more about not teaching kids what to think, but how to think for themselves.” Paul and Elder (2012) identified the following critical thinking skills as components of how to analyze thinking: making inferences, identifying points of view, understanding concepts, asking questions, seeking information (facts and data), and recognizing implications and consequences. Other components of analysis, according to Paul and Elder (2012), included identifying purpose, or objectives, and recognizing assumptions in one’s thinking.

Principals also identified skills reflective of the learners’ critical thinking dispositions and traits of a critical thinker. The dispositions included empathy, flexibility, and understanding other perspectives. Stephanie emphasized that “analyzing analytical arguments, assumptions, personal history, and biases” are fundamental critical thinking skills. Cristina shared “that being able to look at things from different angles, being able to empathize” were also important critical thinking skills. The shift into skill dispositions and traits of a critical thinker as an identification of critical thinking is also supported in the literature. The Paulian framework (Paul & Elder, 2006) identified intellectual traits as an integral component of being a critical thinker. The intellectual traits included intellectual empathy, intellectual humility, confidence in reason, intellectual autonomy, intellectual courage, intellectual perseverance, intellectual integrity, and fair-mindedness (Paul & Elder, 2006). The intellectual traits, according to Paul and Elder (2006), indicated strong–sense critical thinking. Jeff emphasized “flexibility in thinking—the first answer may not be the right answer.” Critical thinking dispositions and traits, while not a

definition of critical thinking, are desirable student outcomes identified by principals in this study and in the literature.

The Critical Thinking Connection to Education Programs

The last finding in relation to the principals' definition of critical thinking is centered around how critical thinking is embedded into education programs. Findings revealed four ways in which principals identified critical thinking in educational programs. Within each of the four findings, there were essential connections between critical thinking and the literature. Specific to this section is the discussion on (a) critical thinking and inquiry and (b) critical thinking and feedback as they relate to curriculum.

Curriculum Supported: Critical Thinking and Inquiry

Principals in the study identified critical thinking as being interwoven into a specific curriculum. Curriculum and critical thinking connections in this study included Science, Technology, Engineering, and Mathematics (STEM), International Baccalaureate, and the Calkins Workshop model. Important to each specific curriculum, principals identified essential components within the curriculums, which included inquiry-based learning and peer and teacher feedback. The principal's connections to critical thinking and inquiry are supported in the literature.

Inquiry as a tool for promoting student questioning and the promotion of student thinking, rather than the regurgitation of content (King, 2002; Nosich, 2012; Stewart & Walker, 2005), was reiterated by the principals in this study. According to Dionisio (2017), "an inquiry-based teaching approach fosters deeper critical thinking" (p. 88). In an inquiry-based learning environment, the learning is carefully designed to foster student ownership of learning (Walport-

Gawrin, 2016). For example, Walport-Gawrin (2016) initiated the inquiry-based learning cycle with the students developing a question "they are hungry to answer" (p. 1). Cristina shared that STEM units "provide students different opportunities and ways to experiment and explore … to come up with their own answer, not letting them think that there is just one answer," and this promotes inquiry and critical thinking. According to Jeff, "group work can be an avenue or a mechanism for critical thinking" because it supports our International Baccalaureate focus on "fostering inquiry." Jeff also stated that, "if you are working hard on inquiry, there is a really good chance that you are also working on some critical thinking skills." Specific to curriculum programs principals mentioned in the study, Ritchhart (2015) noted how the International Baccalaureate learner profile promotes "students as inquirers, thinkers, communicators, and risk takers and as being open-minded, reflective, well balanced, caring, principled, and knowledgeable" (p. 5). The inquiry model promotes students as actively engaged learners and critical thinkers (Dionisio, 2017).

Curriculum Supported: Critical Thinking and Feedback

The Calkins writers workshop model, an example shared by participants, is designed to implement teacher–student conferencing that promote students receiving targeted feedback. Doyle expressed how "critical thinking" is evident in the workshop model when students "receive feedback" and then "apply the feedback" to their writing. Doyle elaborated that "students are taking in information, receiving the information, and then producing something based on what they have received," which is key to being a critical thinker. Principals shared the importance of students growing as critical thinkers with targeted, specific feedback. While feedback is a high-leverage teaching tool (Hattie, 2012), feedback alone does not teach students to be critical thinkers. In this study, principals found the role the student played in the feedback

process was key to their quality reasoning. Doyle noted that the student took an active role in "conferencing" with the teacher. In addition, Jeff shared that feedback was emphasized as a component of the process of learning. While engaged in the process of learning, students were supported by their teacher in working toward one's best thinking, and not their first thinking according to Jeff. Feedback was an essential tool that was used to promote student ownership of their thinking and learning. Reflected in the literature, Elder and Paul (2008) emphasized the importance of student ownership of their thinking and learning and the role of the teacher as a facilitator of thinking.

Discussion of Findings: Principals' Identification of Critical Thinking in Teacher Practices

The findings revealed that principals identified critical thinking in teacher practices through the lenses of student engagement, the teacher's intentional design of instruction and teaching, and through the tools utilized for the instruction of critical thinking. Important to the discussion are also some take-aways from the data collection process. For example, when participants were invited to share exemplars of critical thinking (charts, pictures, classroom examples, etc.), all of the participants opted to not submit any artifacts. Beyond the absence of artifact submissions, a number of participants openly expressed the difficulty in answering the interview questions. Hal shared that critical thinking was "one of those things that you know when you see it, but it's not a prescribed answer … there are so many ways to get there [to critical thinking] and that you can't say this is the one path." Jeff echoed Hal's sentiments by stating that, "with the workforce of the future and the needs of the world … we definitely need people who can understand that there's more than one way to get at a problem [and solution]." Participants rose up to articulate the identification of critical thinking in teacher practices. The following includes discussion on critical thinking and the connection to (a) student engagement,

(b) teachers' intentional design of instruction and teaching, and (c) tools utilized for the instruction of critical thinking.

Critical Thinking and the Connection to Student Engagement

In this study principals identified critical thinking in teacher practices through the lens of student engagement. Student engagement was defined by Groccia (2018) as the act of students taking an active role in their learning process. Groccia (2018) elaborated on student engagement with three areas in which students are actively involved in the learning: (a) behavioral, to participate in the learning process; (b) affective, to show interest and commitment; and (c) cognitive, to process information and experiences. Relevant to this study and discussion is how students participate in the learning process. Noted in the following discussion are the subtheme findings related to how students participate in the learning process. The subthemes include (a) promoting more student-talk than teacher-talk, (b) leveraging teacher and student questioning, (c) encouraging students to take command of their thinking, and (d) fostering a culture of thinking.

Promoting More Student-Talk Than Teacher-Talk

Student engagement, specifically how students participate as critical thinkers in the learning, is noted in the findings. Principals articulated the importance of students engaging as critical thinkers in the classroom through increased student-talk. Principals emphasized the desire for less teacher-talk in the classroom, so that students could have more air space for their out loud thinking and voices. Hudgins and Edelman (1986) noted that student-talk is highly valued as an instructional practice to increase critical thinking in the classroom setting. The decrease in teacher-talk and increase in student-talk encourages the student to "assume more responsibility

for the thinking tasks" (Hudgins & Edelman, 1986, p. 340). When teachers promote the opportunity for student-talk, "a major component of classroom discourse and a vehicle for increasing student learning," this can lead to an improvement in student thinking about content (Franke et al., 2009). For example, teacher questioning strategies promoted more student-talk when students were asked to make their thinking explicit, to clarify and, to correct their thinking, or misunderstandings (Franke et al., 2009).

Leveraging Teacher and Student Questioning

Important to student engagement and student participation in the learning process, is teacher questioning (Cazden, 2001). Quality questioning strategies, strategies that are not prescriptive or relying on rote memorization, are an instructional tool to leverage critical thinking (King, 2002; Stewart & Walker, 2005). Quality questioning strategies and critical thinking are also evident in Socratic Seminars. Principals emphasized the role that Socratic Seminars play in leveraging student engagement and critical thinking skills through Socratic questioning. The Socratic process includes students sharing their thinking, questioning, and to listening to their peers (Allen, 2018; Daniel & Auriac, 2011). Allen (2018) noted that during Socratic Seminars students are engaged in questioning, examining other viewpoints, and understanding the emotions that are attached to their thinking and the thinking of others. Important in the Socratic process is that students questioning themselves and others, and students listen to one another with an open mind (Allen, 2018). Stephanie emphasized that "student thinking is valued" in a classroom that fosters questioning and encourages students to think critically. Equally important in the Socratic process, Ann noted, is teaching students that it is okay to not always have the right answer. It is more important to teach students, according to Dorothy, to "ask the right questions" in order for students to learn to think differently. The role of teacher questioning in

the classroom is less that of leading students to an answer and/or rote memorization, and rather an invitation for students to inquire through their own questions (King, 2002; Stewart & Walker, 2005).

Encouraging Students to Take Command of Their Thinking

Another essential component of student engagement and how students participate as critical thinkers is the way in which students take command of their thinking. In the Socratic process, principals identified students as taking control of their thinking when they participated in Socratic processes while evaluating their thinking and the thinking of others. Different than listening to a peer, evaluation of thinking implies that students have a strong sense of the skills needed to analyze and assess thinking to better understand their thinking and to apply the skills to the thinking of others (Paul & Elder, 2001).

Principals also emphasized the desire for students to exhibit cognitive flexibility. Jeff noted that an important critical thinking skill in the classroom for students to practice is the skill of being flexible in one's thinking. Flexible thinkers, as noted by Costa (2008), "are able to shift, at will, through multiple perceptual positions" (p. 34). Also reflected in the literature is the importance of the student actively "thinking and organizing thinking" according to Tishman et al. (1995). These dispositions promote the student as an active participant in their own critical thinking.

The type of learning opportunities teachers provide for students is also important to how students participate in their learning and engage in critical thinking (Matthews & Lowe, 2011). Principals emphasized the value of student thinking processes versus learning products. In other words, the learning is best optimized when students have opportunities to be flexible with their thinking (Costa, 2008; Paul & Elder, 2001), to ask questions (Ennis, 1996; Marin & Halpern,

2011; Paul & Elder, 2001), and to engage in the process of learning (Staib, 2003) as a critical thinker.

Fostering a Culture of Thinking

An additional finding in this study illuminated the significance of an established safe culture and climate so students are able to engage as critical thinkers. The literature supports this type of learning environment, naming it a culture of thinking (Tishman et al., 1995). The culture of thinking is comprised of a safe environment where students have opportunities to share their thinking and improve their thinking (Tishman et al., 1995). The principals expressed the need for students to be able to question, to receive feedback, and to be respectful of each other as worthy outcomes of creating a culture of thinking. "Create a culture—that is the work," expressed Jeff. Stephanie explained that "to build a classroom community where thinking is valued is probably the first critical thinking skill you have to build. It is an essential groundwork piece." Principals also shared that for students to engage in critical thinking, their intellectual safety is of utmost importance. The values in the classroom need to reflect the goal for each student to practice being a critical thinker and to grow in their thinking. Ritchhart (2002) emphasized how a safe and supportive classroom culture and environment is a key component to the nurturing of students and their growth as thinkers.

Critical Thinking and Connection to the Teachers Intentional Design of Instruction and Teaching

The results of this study further revealed that principals identified critical thinking in teacher practices through the teacher's intentional design of instruction and teaching. As instructional leaders, the principals in this study shared experiences, examples, and a desire for teachers to have strong instructional practices in place to implement critical thinking in their

classrooms. The following are the teacher practice subthemes: (a) planning for thinking routines, (b) balance of prescribed core curriculum instruction and critical thinking instruction, and (c) making learning relevant.

Thinking Routines

To foster a culture of thinking in a learning environment, it is key to plan for critical thinking routines. The findings revealed that principals placed great emphasis on teachers' careful consideration to the intentional design of thinking routines to promote critical thinking. The thinking routines and structures, according to Ritchhart (2015), are the routines that dominate a classroom environment. The routines set up the invisible patterns for behavior that extend beyond managerial concerns (Ritchhart, 2015). Principals identified thinking routines in classrooms when the routines were embedded into classroom instruction. The intentional inclusion of the critical thinking routine in the lesson delivery, according to Linda, gave students a greater opportunity to focus on their thinking.

Teacher modeling of thinking routines is a key instructional element and reflected in the literature. Ritchhart (2002) stressed that teachers need to model how to engage in their thinking so that students will engage in their own thinking. Principals emphasized the importance of teacher modeling through "think-alouds" and how to be flexible with their thinking. The goal for thinking routines, according to the findings, places high value on the process of thinking rather than a product of thinking.

Balance of Prescribed Core Curriculum Instruction and Critical Thinking Instruction

Another essential finding from this study focuses on the balance of prescribed core curriculum instruction and critical thinking instruction. Principals, while thankful for district

resources, articulated that the teaching of critical thinking was challenging given all the content teachers were expected to teach. Despite the challenge, principals placed great emphasis on the need for critical thinking to be taught. Paul (1992) addressed this challenge with a focus on critical thinking skills that target how to think, rather than a focus on mastery of content that can be learned. In this study, Dorothy expressed this very sentiment, that students need to receive "explicit instruction on how to think." Ritchhart (2015) went a step further in stating that curriculum that teaches students what to think, rather than how to think is distancing "students from their own ideas, opinions, creativity, and reason" (p. 6). With this notion, it is the teacher's responsibility to balance teaching critical thinking with the prescribed core curriculum. Lily expressed that when teachers "analyze the [academic] standards" and "shift the lesson" in the prescribed core curriculum, critical thinking instruction can occur, however, this is a difficult task. Pearlman (2020) stated that critical thinking needs to be at the forefront of instructional design.

While principals highly valued and placed critical thinking at the forefront of instruction, in North Park S25 School District there is not enough evidence to support that critical thinking is the driving force for instruction. Recent polls and surveys where college students and college graduates self-reported revealed that critical thinking skills were not a skillset they graduated with (Deloitte Global, 2018; MindEdge, 2019). Participants in this study expressed frustration in how to support teachers with balancing curriculum, standards, and teaching for critical thinking. Rather than curriculum driving instruction, critical thinking needs to be the driving force and the thread tying the learning together according to Pearlman (2020), the co-founder of the Critical Thinking Initiative.

Making Learning Relevant

Lastly, the principals in this study appealed for teachers to make learning relevant. According to Halpern (1998), real-world, life-related learning and instruction is a fundamental for teaching students to be critical thinkers. Principals expressed a compelling need for teachers to provide meaningful real-world learning opportunities for students. For students to be real-world ready, Dorothy expressed teachers need to utilize "explicit instruction on how to develop thinking skills or strategies … and students need to be taught how to think for themselves." Pearlman (2020) noted that problem-based learning is key to this call for relevant learning. "It makes students *matter*. It makes their critical thinking acquire intellectual relevance and *power*" (p. 98, emphasis in original). Cristina shared how her school engaged in a local community project, and social studies and science standards were integrated into the problem-based learning. Students came up with "different solutions" and presented their findings to the Chamber of Commerce. The emphasis on making learning relevant and teaching students to think critically lies within the teacher's instructional design and instructional delivery.

Critical Thinking and the Tools Utilized for the Instruction of Critical Thinking

The data indicated that teachers used numerous teaching tools in their practices to support the instruction of critical thinking. The tools that principals named included Bloom's Taxonomy (Bloom et al., 1984), Elder and Paul Wheel of Thought (Elder & Paul, 2018), and Math Practice Standards (Burns, 2012). The Bloom's Taxonomy of thinking, referenced mostly in the findings in this study and in the literature, as higher-order thinking, is a tool that scaffolds knowledge from basic acquisition of knowledge to the synthesis of knowledge (Bloom et al., 1984) and is commonly referenced in teacher preparation courses.

Stephanie received Paul and Elder training and noted that critical thinking is evident through “fair-minded thinking, implications, consequences, and by providing a structured introduction of concepts and language for students.” The Elder and Paul Wheel of Thought is a critical thinking tool designed to focus on the eight elements of thought and/or reasoning which include information, point of view, inferences, concepts, assumptions, implications, questions at issue, and purpose (Elder & Paul, 2018; Paul & Elder, 2006). The Wheel of Thought is designed for the analysis of thinking and the intellectual standards are designed for the assessment of thinking (Elder & Paul, 2018; Paul & Elder, 2006). Intellectual standards include asking questions of relevance, significance, accuracy, precision, depth, and fairness (Elder & Paul, 2018; Paul & Elder, 2001). The application of the Wheel of Thought and intellectual standards to thinking, in a disciplined manner, provides a well-organized structure for the improvement of one’s reasoning (Elder & Paul, 2018; Paul & Elder, 2006).

In relation to the Math Practice Standards (Burns, 2012), principals emphasized the importance of looking at the “big picture connections” as a way of engaging students in critical thinking. Stephanie shared that Math Practice Standards are critical thinking. She stated that the “thinking goes beyond a single problem.” Jacy elaborated on what happened when students used mathematical practices: “They are really deconstructing their thinking around what steps they took and how they apply their knowledge. There is a lot of explanation around how the math problem could be used or what the meaning of the problem was.” Burns (2012) noted that it is important to be selective in which Math Practice Standards are emphasized in a lesson to deepen content learning. A key component of teaching for critical thinking, according to Elder and Paul (2008), was the notion that students are critically thinking through key concepts in the content areas they are learning about and then applying that learning to inquiries related to problems

and/or issues relevant to their experiences. Teacher practices are leveraged with the use of tools and materials to support students as critical thinkers.

Recommendations for Policy

Through the examination of the findings in this study, recommendations specific to policy are worth noting. Policy is key for any type of systemic implementation of critical thinking at the national, district, and local level. Policy sets the precedence for importance and focus. At the national level, it has been over a decade since critical thinking was identified as an important goal for education (United States Department of Education [USDOE], 2010). Teaching our leaders, teachers, and students to be critical thinkers needs to be shouted from the mountain tops and echoed throughout the valleys of every state, district, and community. To make critical thinking a priority, critical thinking needs a definition that captures the depth, complexity, and process of what it means to think critically. Paul (2010) noted the difficulty in identifying a shared definition, and rather emphasized the "sensitivity to the many ways we can help students" to be critical thinkers with the use of the important features of critical thinking and tools for the analysis, evaluation, and improvement of thinking as the guiding principles (p. 281). A clear articulation of the features of critical thinking and tools for the analysis, evaluation, and improvement of thinking (Paul & Elder, 2006) would be a promising step for the advancement of critical thinking.

The creation of a shared definition that articulates the process of thinking critically, specifically the evaluation, analysis, and improvement of thinking could be key for systems alignment at the national, state, and school district level. To eliminate confusion in the education system, a definition that is shared between national standards, state standards, district unified

improvement plan focus areas, and teacher evaluation standards is one recommendation to align a large system and bring a central focus through policy.

In addition, having a shared definition of critical thinking and the identification of critical thinking skills in teacher practices could be impactful to the teacher evaluation process. Participants in this study had experience evaluating teacher practices that promoted students as critical thinkers. Principals are responsible for evaluating teachers on their teacher practices that promote critical thinking; therefore, principals need opportunities to discern how critical thinking is defined, to understand the process of thinking critically at the teacher and student level, and to identify in teacher practices the skills that promote the process of students thinking critically.

Recommendations for Practice

"Teachers today are defining themselves less as dispensers of knowledge and more as facilitators of critical thinking, reasoning, and argumentation. We know that if we want our students to engage in critical thinking, we must be critical thinkers ourselves" (Fisher & Frey, 2014, p. 28). Throughout the interviews, principals echoed the desire for teachers to facilitate thinking, to teach reasoning, and to encourage students to be independent thinkers. The recommendations for practice are as follows: value critical thinking, define critical thinking, describe critical thinking, prioritize critical thinking, and protect critical thinking. The following recommendations are informed by the findings of this study.

Value Critical Thinking

The value of critical thinking is evidenced in businesses and higher education (Deloitte Global, 2018; Ennis, 2011; Hart Research Associates, 2018; MindEdge, 2019). Critical thinking is a high priority and highly valued as an educational outcome according to participants in the study as well. Linda shared that "we have to stop thinking of it [critical thinking] as an event …

rather it becomes part of what we do and how we do it." To value critical thinking, means to place critical thinking as the highest educational priority and student outcome. To value critical thinking, similar to what Cristina stated, "critical thinking should be embedded in everything we do." The value of critical thinking in the findings is evident. To value critical thinking at the district level, district leadership needs to maintain a concerted focus on critical thinking that is systemic. The navigation of the day-to-day tasks that a principal manages can be overwhelming and all consuming, as the participants in this study alluded to. Principals in this study sought guidance and direction from district-level leadership. Another recommendation for district-level leadership is to prioritize critical thinking as a student outcome within district initiatives.

As instructional leaders, principals need time to dialogue with one another about critical thinking. Vanessa expressed a need for professional development opportunities specific to critical thinking. Principals need time to analyze and assess their understandings and how they identify critical thinking in teacher practices. Principals in this study expressed gratitude for the time to think critically about critical thinking during the interview process. "Just having this conversation is really helpful for me as an evaluator because it helps me to clarify some of my thinking about critical thinking," shared Jeff. To value critical thinking at the site-based level, principals need to foster a culture of thinking. Critical thinking values need to be embedded into the systems and structures at the building level in order to promote a culture of thinking. For example, principals can model critical thinking practices in daily building routines, student positive behavior systems, announcements, and newsletters. Principals need to foster fair-minded thinking by encouraging the asking of challenging questions, analyzing thinking, and assessing thinking in order to improve the quality of thinking. Critical thinking is valued by principals when teachers are supported in utilizing critical thinking teaching practices, practices that

promote student-talk versus teacher-talk, practices that encourage student ownership of learning, practices that foster real-world learning experiences, practices that value student processes over student products, and overall practices that value our students in their growth as strong–sense critical thinkers.

Define Critical Thinking

School district leaders play an important role in the advancement of critical thinking in schools. According to the findings, a shared definition that identifies the process of thinking critically is necessary within a district system. A shared definition established with stakeholder (principals, teachers, staff, students, families/guardians) input and supported by district leadership, would serve as a guide, a North Star, as to what critical thinking is and is not. Important to note are the complexities within defining critical thinking.

A definition that meets the criteria for understanding the process of how to think critically is key. The process of thinking critically is evident in the Paulian theory and framework (Elder & Paul, 2018). The Paulian definition of critical thinking focuses on the process of analyzing, evaluating, and improving thinking (Paul & Elder, 2006).

Additionally, to support the depth of understanding in regard to the process of thinking critically, like that of the Paulian framework, it is necessary for district leaders to provide professional development for principals and teachers to learn alongside one another. The findings revealed that a few participants had received critical thinking training in the past. Those participants, when asked to define critical thinking, shared similar skills and traits related to critical thinking. Some of the overlapping definitions from participants included the evaluation and analysis of thinking. Overall, critical thinking is best understood when a concrete, common, definition focused on the critical thinking process is shared with and by all stakeholders

including district leadership, building leadership (principals), teachers, staff, students, and families/guardians is established.

Describe Critical Thinking

Key to the integration of critical thinking in schools is that school leaders need to clearly describe critical thinking. To describe critical thinking, it is important to focus on a critical thinking definition that defines the process of thinking critically, accompanied with a robust description of critical thinking skills (Paul & Elder, 2006). These two components are important so principals can identify critical thinking in student outcomes and operate with a clear description of critical thinking skills. For example, the findings revealed critical thinking skills that included inference, evaluate, analyze, and taking on multiple points of view. In addition, for principals to identify critical thinking in teacher practices, a clear description of critical thinking instructional practices is needed. Principals and teachers need a clear description of pedagogical practices that promote students' growth as critical thinkers. The findings of this study illuminated the promotion of more student-talk than teacher-talk, leveraging teacher and student questioning, encouraging students to take command of their thinking, and fostering a culture of thinking. Additional findings included teacher practices that establish thinking routines, balance the prescribed core curriculum with critical thinking, and making learning opportunities relevant to a real-world application.

Prioritize Critical Thinking

Participants were forthcoming in identifying the plethora of tasks that teachers are expected to accomplish. They noted these tasks and expressed great care and empathy toward their teachers. Participants also emphasized the need to prioritize critical thinking as a student outcome and identify critical thinking in teacher practices. In reference to prioritizing critical

thinking, Jacy stated, “I don’t know why you would be teaching without fostering critical thinking. I don’t think any of our teachers want their students to be low level thinkers.” To prioritize critical thinking will take care, consideration, and balance.

To prioritize critical thinking, teachers, principals, and district leadership need to be well-informed about critical thinking. The following are key ideas for the prioritization of critical thinking in our schools: (a) the identification of a shared definition, by all stakeholders, of critical thinking and the process of critical thinking; (b) professional development provided by district leadership for the principal and teacher to gain a shared understanding of critical thinking theory; (c) identification and modeled teacher practices to promote critical thinking supported by principals; (d) balancing the instruction and assessment of content, prescribed core curriculum, standards, and integration of critical thinking supported by district leadership and principals; (e) the identification, by principals and teachers, of student descriptors of strong–sense critical thinking; and (f) principals and instructional coaches are present in the classroom and act as an instructional leader to teachers through observation, co-teaching, co-planning, modeling teacher practices, and providing timely teacher feedback. The prescribed core curriculum, as the participants noted, can be limiting and prohibit critical thinking practices. Allocating time for teachers to deconstruct the curriculum and/or standards and integrate critical thinking practices is important to take critical thinking from theory to practice.

Participants in this study also shared how students who exhibited critical thinking skills were noted as having higher engagement in learning. Principals need to prioritize high intellectual engagement as a student outcome. Not new to education is the phrase, our plates are full. With a focus on critical thinking, critical thinking is prioritized when it becomes the plate.

Protect Critical Thinking

The last recommendation is to protect critical thinking. Leadership at all levels can protect critical thinking by making it systemic and systematic; critical thinking is best supported when systems and structures develop a culture of thinking (Ritchhart, 2015). Systems in education are established and supported by district, building, and teacher leadership. In order for school district leaders and principals to protect critical thinking, critical thinking needs to be highly valued and shielded from any and all obstacles (systemic fragmentation, curriculum overload, lack of professional development, and too many important initiatives) in the education system. School leaders need to protect principals and initiative overload and principals need to protect teacher workloads. Participants expressed concern for teachers' workloads and also maintained a focus on students developing critical thinking skills and teachers implementing critical thinking teacher practices as a worthy goal.

The path to critical thinking will take time to fully understand the complexities that exist within systems. For leadership to make critical thinking systemic, district leaders, principals, and teachers need to engage in shared learning across systems and structures. Additionally, to make critical thinking systemic and systematic it is essential to identify the best teacher practices to promote students as critical thinkers, bring attention to critical thinking teacher practices, and focus on what teachers who teach critical thinking do in their instructional practices to foster a culture of critical thinking.

Quality professional development provided by district leaders for principals and teachers on critical thinking is non-negotiable. The findings revealed that participants requested professional development on critical thinking. Vanessa, specifically, expressed how difficult it is to speak about critical thinking without having engaged in any critical thinking professional

development. According to Hattie (2012), when leaders participate in teacher learning and development, there is an effect size of 0.84 for increasing implementation and improving teacher practices. In other words, to improve student outcomes with improved teacher practices, building leaders and principals need to engage in the learning alongside their teachers. This notion was evident during the participants debrief.

Finally, to protect critical thinking it is vital for district leaders to make a concerted focus on critical thinking a systemic value, pervasive throughout the system, and systematic, having systems and structures in place to support it. The district board of education is an important stakeholder to include in this process. The board of education is charged with looking out for the best interest of the students and can support the advancement of critical thinking and best practices with policy. Also important are the steps district leaders, principals, and teachers need to engage in to identify how students become critical thinkers and focus on teacher practices that support the advancement of student ownership of critical thinking; in other words, students who become critical thinkers do the following. The protection of critical thinking shields it and relinquishes it as any type of educational fad and protects the educated mind as the outcome of education.

Summary

In summation, the recommendations for practice included five key ideas. The five key ideas in relation to critical thinking practices included to value critical thinking, define critical thinking, describe critical thinking, prioritize critical thinking, and protect critical thinking. These recommendations are supported and influenced by the findings. In regard to district leaders, district leadership needs to provide guidance and direction for principals in supporting teachers with the implementation of critical thinking practices, prioritize critical thinking as a

student outcome with district initiatives, and provide professional development for principals and teachers, together. Other recommendations specific to principals included the need for principals to prioritize instructional practices that promote critical thinking, to prioritize high intellectual engagement as a student outcome, to foster a culture of critical thinking, and to support teachers in the navigation of the prescribed core curriculum and integration of critical thinking practices. The recommendations for practice are designed for district leadership and principals to advance critical thinking in school districts and school buildings.

Recommendations for Future Research

The field of critical thinking in education is ripe for research. After completing this inquiry, I began to reflect on areas that I would encourage future research to take place. The recommendations for practice could be a stepping off point for guiding research questions. Specifically, what professional development might staff (district leaders, principals, teachers, and support staff) need to support their growth as critical thinkers? Participants emphasized the need for professional development related to critical thinking. The investigation into systems and structures to support critical thinking at the district level would be valuable to the field. Future research at the district level might include a closer look at where resources and/or personnel are allocated in relation to the implementation and alignment of critical thinking with district vision and mission statements. The investigation into the field of district leadership and how to establish systems and structures to promote critical thinking is important. Findings revealed that in North Park S25 School District critical thinking, while noted as a graduate competency, lacked any system or structure in favor of prioritizing critical thinking.

Another area of inquiry includes classroom teacher practices. Classroom observations to observe teacher practices and student interactions would be valuable research for principals to

see critical thinking in real time, in real classrooms, in teacher practices (Cohen & Goldhaber, 2016). Inquiries such as these could provide meaningful insights to the improvement of the teacher evaluation process. Specifically helpful to observe would be the teacher practices utilized to promote a language of critical thinking and the direct instruction of critical thinking. Beyond teacher practices, observations could give insight into students' development as critical thinkers. Gaining insight into effective classroom teacher practices, as evidenced in the findings, focused on the establishment of a culture and climate to foster critical thinking, thinking routines and structures, inquiry, feedback, close reading, Socratic dialogue, and other teacher practices that encourage students to take command of their thinking is key to the improvement of instruction and teaching and the teacher evaluation process.

Future research on principal professional development, grounded in a shared understanding of the student skills and dispositions that embody a critical thinker, in a like group of principals would be worthy of consideration. Specific to this research is a focus on teacher evaluation and how principal professional development impacts the evaluation process. To effectively evaluate teachers, principals need to support critical thinking in classrooms, develop teachers' capacities in critical thinking instruction, and identify critical thinking in action.

The contribution of future research in the field of education can support the advancement of critical thinking as an educational outcome. Without a focus on critical thinking, it will continue to be an afterthought in policy, funding, all levels of leadership, and teacher practices. We must move away from what we have learned in education, which is to name and identify critical thinking with any and everything we deem it might be or could be; rather, be targeted and specific about what it actually is so critical thinking can thrive.

Conclusion

The focus on students' development of critical thinking skills has been skirted around over and over, year after year, with focus on initiative after initiative in our schools, districts, states, and country. Teacher practices that foster critical thinking skill development are rarely talked about, and principals are tasked with the evaluation of a plethora of skills teachers need to master during the annual teacher evaluation process. Beyond these systemic roadblocks exists a substantive lack of qualitative research focused on how principals evaluate teacher practices specific to the growth of students as critical thinkers. A component of this dearth of research regarding critical thinking in schools is the lack of a shared definition principals use to define critical thinking, the process of critical thinking, and the lack of the identification of teacher practices that are utilized to promote students as critical thinkers in the teacher evaluation process. This research study contributes to the literature related to principals as evaluators of teacher practices. This inquiry identified three themes central to Research Question Q1 on how principals define critical thinking. The three themes include (a) critical thinking has many interpretations, (b) critical thinking includes a wide variety of skills, and (c) critical thinking is embedded in education programs. In regard to Research Question Q2 on how principals identify critical thinking in teacher practices, the results of the study revealed two themes. The themes include (a) principals identify critical thinking through student engagement and (b) principals identify critical thinking through the teacher's intentional design of instruction and teaching. Listening to the participants express their frustrations about all building principals are tasked with, and trying to navigate the definition and identification of critical thinking, was a reminder that fostering a culture of critical thinking where critical thinking is evident in district systems, the school culture, teacher practices, and student outcomes is the important work we need to be

doing. Critical thinking as a first step to the betterment of our schools, may just be the most critical step we need for the betterment of society.

Researcher Reflections

As a building principal and teacher evaluator whose responsibilities include overseeing the brick-and-mortar in the building, the outdoor areas, traffic flow, and overall general safety protocols, supporting family connections and concerns, student well-being, Coronavirus disease health and safety protocols, staff climate and culture, curriculum and assessment, and maintaining as an instructional leader, this study has had a significant impact on my sense of urgency to refocus on critical thinking implementation in my building. This structured inquiry allowed me to set my biases and previous notions about critical thinking, definitions, and identification aside. Through the semi-structured interview process, I used predetermined interview questions and probed with follow-up questions when necessary to better understand the participants' point of view. As I crafted Chapter IV, I felt the participants were in the room with me. After countless reviews and revisits to the interview transcripts, I sensed their process of meaning making through their carefully crafted words and descriptions. I had a meaningful connection with each participant, which provided them with a safe environment for being vulnerable throughout the interview process. As we progressed through the questions, the principals showed great perseverance and vulnerability. After the interviews were completed, the participants thanked me for the opportunity to reflect on critical thinking. They were thankful to bring it to the forefront of all of their tasks, initiatives, and must-do's. They were thankful to be heard and listened to.

In the leadership role, leaders are balancing a plethora of competing tasks, initiatives, and mandates. This was evidenced in the interview process. As the participants spoke about critical

thinking, it was as if critical thinking was being taken out of the big closet in the back bedroom of the old farmhouse and being dusted off. This gave me pause. Key elements for moving critical thinking forward, in my opinion, transpired from this inquiry. It is no longer acceptable to talk about critical thinking without a shared definition. It is no longer acceptable to look for critical thinking in teacher practices without a shared conception of identifiable practices. We cannot take for granted that we are all talking the same talk as building principals and teacher evaluators.

As this study comes to an end, I seek to build leadership capacity and increase teacher practices for teaching critical thinking in order to improve student outcomes and to foster students as critical thinkers. It is important through the process that principals and teachers learn alongside one another. It is important to have resources and tools for principals and teachers to access for their own critical thinking growth and journey. To advance critical thinking in the field of education it is fundamental to value it, define it, describe it, identify best teacher practices, identify how students become critical thinkers, prioritize it, make it systemic and systematic, and protect it. It is our ethical duty to leverage fair-minded critical thinking in all we do as educators.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

Date:	06/16/2021
Principal Investigator:	Carmen Polka
Committee Action:	**IRB EXEMPT DETERMINATION – New Protocol**
Action Date:	06/16/2021
Protocol Number:	2105026634
Protocol Title:	Principals' Definition and Identification of Critical Thinking in Teacher Practices
Expiration Date:	

The University of Northern Colorado Institutional Review Board has reviewed your protocol and determined your project to be exempt under 45 CFR 46.104(d)(702) for research involving

Category 2 (2018): EDUCATIONAL TESTS, SURVEYS, INTERVIEWS, OR OBSERVATIONS OF PUBLIC BEHAVIOR. Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7).

You may begin conducting your research as outlined in your protocol. Your study does not require further review from the IRB, unless changes need to be made to your approved protocol.

As the Principal Investigator (PI), you are still responsible for contacting the UNC IRB office if and when:

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

- You wish to deviate from the described protocol and would like to formally submit a modification request. Prior IRB approval must be obtained before any changes can be implemented (except to eliminate an immediate hazard to research participants).
- You make changes to the research personnel working on this study (add or drop research staff on thi protocol).
- At the end of the study or before you leave The University of Northern Colorado and are no longer a student or employee, to request your protocol be closed. *You cannot continue to reference UNC on any documents (including the informed consent form) or conduct the study under the auspices of UN if you are no longer a student/employee of this university.
- You have received or have been made aware of any complaints, problems, or adverse events that ar related or possibly related to participation in the research.

If you have any questions, please contact the Research Compliance Manager, Nicole Morse, at 970-351-1910 or via e-mail at nicole.morse@unco.edu. Additional information concerning the requirements for the protection of human subjects may be found at the Office of Human Research Protection website - http://hhs.gov/ohrp/ and https://www.unco.edu/research/research-integrity-and-compliance/institutional-review-board/.

Sincerely,

Nicole Morse
Research Compliance Manager

University of Northern Colorado: FWA00000784

APPENDIX B

INITIAL INTERVIEWEE CONTACT EMAIL

INITIAL INTERVIEWEE CONTACT EMAIL

“Hello, my name is Carmen Polka.” I am a doctoral student at the University of Northern Colorado. As part of my studies, I am conducting research on the principal’s role in evaluating critical thinking using the Colorado State Model Evaluation System (CSMES) tool. Specifically, the focus of my research is to learn more about how principals define critical thinking and identify critical thinking utilized in teacher practices in the general education classroom. You are being contacted because you meet the criteria as a principal in Colorado that uses the CSMES tool to evaluate teachers. It is my hope that you will let me learn from your experiences through an interview.

Participation in the study is voluntary and will have no bearing on your position in the school district. I will honor your privacy and will take up, no longer than 60 minutes of your time. The interview will be held via video conferencing or in person at a time and place that is convenient for you. The interview will include background questions and questions about your experience evaluating teachers. Once the interview is complete and analyzed, I will share my findings with you and may need to follow up with more questions to support the inquiry.

Please let me know if you are interested in participating in my research study. I am so appreciative of your time and knowledge.

Thank you,
Carmen A. Polka
UNC Doctoral Candidate

APPENDIX C

INTERVIEWEE CONSENT EMAIL

INTERVIEWEE CONSENT EMAIL

Hello _____,

I am following up on my initial contact with you. Please know that participation in the study is voluntary and will have no bearing on your position in the school district. I will honor your privacy and will take up to no longer than 60 minutes of your time. The interview will be held via video conferencing or in person at a time and place that is convenient for you. The interview will include background questions and questions about your experience evaluating teachers. Once the interview is complete and analyzed, I will share my findings with you and may need to follow up with more questions to support the inquiry.

Please review the Consent for Participation and sign this document electronically prior to the interview. Additionally, if you could please email the answers to the following questions prior to our meeting time, this would be so helpful.

To assist in the beginning phase of the interview, I would like to ask some questions about your general demographics.
Initial interview questions:

- Tell me about your background in education.
- How long have you been in the district?
- How long have you been a principal?
- How long have you been in your current building assignment?
- How many teachers do you evaluate?
- What types of classrooms do you most regularly evaluate?
- What is your background and experience in critical thinking, if any?
- Tell me about any training you have had in critical thinking or evaluating critical thinking.

I am so appreciative of your time and knowledge.

Thank you,
Carmen A. Polka
UNC Doctoral Candidate

APPENDIX D

INSTITUTIONAL REVIEW BOARD INFORMED CONSENT FOR PARTICIPATION IN RESEARCH FORM

College of Education and Behavioral Sciences
Educational Leadership and Policy Studies

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title: **Principals' Definition and Identification of Critical Thinking in Teacher Practices.**

Researcher: Carmen Polka, University of Northern Colorado, Doctoral Candidate

Phone: xxx-xxx-xxxx

Email: polk7815@bears.unco.edu

Research advisors: Dr. Michael Cohen, Educational Leadership and Policy Studies
Dr. Amie Cieminski, Educational Leadership and Policy Studies
Phone: xxx-xxx-xxxx Email: Michael.cohen@unco.edu
Phone: xxx-xxx-xxxx Email: amie.cieminski@unco.edu

I am Carmen Polka, a doctoral candidate in the Educational Leadership and Policy Studies department at the University of Northern Colorado. I am interested in conducting research on principals' definition and identification of critical thinking in teacher practices. You have an important role as a principal that evaluates teachers utilizing the Colorado State Model Evaluation System to evaluate critical thinking in teacher practices and therefore, have been selected as a candidate to participate in this research study.

The purpose of this qualitative instrumental case study is to gain an in-depth understanding of how Colorado principals, from a specific school district, conducting teacher evaluations define critical thinking and identify critical thinking in teacher practices. This research aims to inform educational leaders on how critical thinking is defined and identified in teacher practices in the general education setting.

Participation Requirements

Interviews will be held virtually, in a private setting, and will take no longer than one hour. The interview questions will focus on your conception of critical thinking and identification of critical thinking in teacher practices. Questions will include but are not limited to: Would you explain to me your concept of critical thinking? Perhaps you could begin by completing the following sentence: "To me, critical thinking is _____." Think back to when you have witnessed a teacher fostering critical thinking. Describe that for me? Interviews will be recorded so your comments are represented and transcribed accurately.

Confidentiality Procedures

I am not able to fully guarantee confidentiality, however, I will be diligent in taking steps to ensure confidentiality to the best of my ability. After the interviews are transcribed, you will have the opportunity to review your interview transcription for accuracy. The data from the interviews will be kept in a password protected program and identified with a pseudonym to maintain anonymity. Recordings, transcripts, and electronic files will be deleted three years after the study is completed. Once the research paper is written, if you choose, I will provide you with a copy of the final research paper.

This study does not provoke any foreseeable risks and/or discomfort to you. You may share personal and private information regarding their opinions, experiences, and feelings toward students and schools in close proximity to your work environment. You may benefit by reflecting and answering my questions.

I hope to use the findings from the study to provide suggestions for implementing practices and actions used by leaders as a support for sustained student achievement.

The potential benefit for participants is to share their experience in related fields. If the study leads to publication, participants' opinions can positively impact more educators in education settings pertaining to practices and actions used by leaders as a support for sustained student achievement.

Participation is voluntary. You may decide not to participate in this study and if you begin participation, you may still decide to stop and withdraw at any time.

Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse at the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Sincerely,

Carmen Polka

xxx-xxx-xxx

polk7815@bears.unco.edu

If you agree to participate in this study, please sign below:

_____

Subject's Signature Date

_____

Researcher's Signature Date

APPENDIX E

INTERVIEW PROTOCOL

INTERVIEW PROTOCOL

Hello _____,

I am currently a Doctoral student in the Educational Leadership and Policy Studies program at the University of Northern Colorado (UNC). Thank you for agreeing to be a participant in the research I am conducting on the principal's role in evaluating critical thinking using the Colorado State Model Evaluation System (CSMES) tool. The following interview questions will help me to better understand your role in evaluating critical thinking using the Colorado State Model Evaluation System (CSMES) tool.

Interview questions include but are not limited to:

- Would you explain to me your concept of critical thinking? Perhaps you could begin by completing the following sentence: "To me, critical thinking is _____."
- Think back to when you have witnessed a teacher fostering critical thinking. Describe that for me?
- Please provide a few more examples of teachers fostering critical thinking.
- What particular critical thinking skills do you believe are most important for your teachers to teach and students to develop?
- How do you evaluate if a teacher is emphasizing or fostering critical thinking through his or her instruction?
- Some teachers feel they have too much content to cover to have much time left for fostering critical thinking. As a teacher evaluator, what is your view of this position?

- Is there anything else relevant to the definition of critical thinking that you would like to share?
- Is there anything else you would like to share about the use of critical thinking in teacher practices in schools?

As part of my research, I want to invite you to share artifacts or documents that support your ideas such as pictures of classroom anchor charts, lesson study samples, critical thinking resources, observation checklists or evaluation tools, unit organizers, and other items that illustrate the definition of critical thinking and/or demonstrate how the use of critical thinking is reflected in teacher practices in the classroom. I will send you an email with the types of artifacts and a link to a shared folder. Again, I am so appreciative of your time and knowledge.

Thank you,
Carmen A. Polka
UNC Doctoral Candidate

APPENDIX F

EMAIL FOR INTERVIEWEE ARTIFACT SUBMISSION

EMAIL FOR INTERVIEWEE
ARTIFACT SUBMISSION

Dear Participant,

Thank you for your participation in the interview portion of my research on the principal's role in evaluating critical thinking using the Colorado State Model Evaluation System (CSMES) tool. Specifically, the focus of my research is to learn more about how principals define critical thinking and identify how critical thinking is used in teacher practices in the general education classroom. As a follow up to our recent interview, I am asking for copies of documents or artifacts such as pictures of classroom anchor charts, lesson study samples, critical thinking resources, observation checklists or evaluation tools, unit organizers, and other items that illustrate the definition of critical thinking and/or demonstrate how the use of critical thinking is reflected in teacher practices in the classroom. Please upload them into the Google folder using this individual link. It is my hope to continue to learn from your experiences.

Thank you for participating in my research study. I am so appreciative of your time and knowledge.

Thank you,
Carmen A. Polka
UNC Doctoral Candidate