Incorporating Critical Thinking: Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Courtney Milligan

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Incorporating Critical Thinking: Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Courtney Milligan
Educational Leadership Doctoral Program

Submitted in partial fulfillment
of the requirements of
Doctor of Education in Educational Leadership

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National Louis University
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Incorporating Critical Thinking: Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Dissertation Hearing

Submitted in partial fulfillment
of the requirements of
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ABSTRACT

The ability to think critically is a fundamental life skill and is an essential part of being a productive and contributing member of society. “Research shows that elements of critical thinking need to be taught *explicitly*” (Haber, 2020). The practice of developing critical thinking skills while students are initially "developing as thinkers" in primary grades is essential. According to Wagner (2008), his research finds that children should begin developing critical thinking skills as soon as they “are capable of abstract thinking” (p.17). Wagner (2008) argues that students need to develop these essential skills to effectively participate in our democracy and ever-changing global environment (p.15).

The purpose of this study was to examine teachers’ perceptions, knowledge, and abilities in the development of critical thinking skills in grades K-2. Insights gained from this study will be used to make recommendations to teachers and administrators to develop critical thinking skills in primary grades through teaching strategies and technology integration.

The study used an exploratory sequential design that included qualitative data collection, analysis, and results that led to an overall interpretation of the data. This design starts with qualitative data, collected through an online survey and semi-structured interviews, where themes were developed before building to a second quantitative phase (Creswell, Plano Clark, et al., 2003, p.77). Eighteen participants responded to the survey, ranging from K-2nd grade classroom teachers, resource teachers, self-contained teachers, ELL teachers, interventionists, and an enrichment teacher. With a response rate of 64%, this allowed the researcher to extrapolate the data. The focus question of this study was, "What teaching strategies do primary teachers use in their teaching of critical thinking?" To answer this question, the researcher utilized 19 Likert scale type questions and five open-ended questions related to teachers'
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understanding of critical thinking and how it is taught through instruction in K-2 grades. The
survey was emailed to all invited participants and completed voluntarily by Morgan Park
Elementary teachers (pseudonym). After analyzing the survey data, survey respondents
participated in interviews to expand their views and understandings of what and how they teach
“thinking” to students. Eight of the eighteen survey respondents participated in the interviews.

Prevalent themes from the data analysis were teachers' beliefs about the importance of
critical thinking skills and their self-confidence to teach these needed skills. Additionally,
participants perceived that students lacked the necessary background knowledge and ability to
use/develop critical thinking skills. Furthermore, participants identified the lack of time,
resources, and professional development as perceived barriers to teaching necessary thinking
skills. Even though teachers recognize the importance of teaching critical thinking skills in the
classroom, teaching both content and these foundational skills consistently to young learners has
been challenging.

*Keywords:* critical thinking, primary grades, mixed-methods research, technology,
teacher perceptions, self-efficacy, meta-cognition
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PREFACE

When I was deciding what direction to take for this research study, I was inspired by the notion that Wagner (2008) argues that students in the U.S. are graduating from both high school and college “unprepared for the world of work” (p.xx). According to Wagner (2008), “Only about a third of U.S. high school students graduate ready for college today, and the rates are much lower for poor and minority students. (p.xix). Wagner (2008) continues to argue, “Sixty-five percent of college professors report that what is taught in high school does not prepare students for college” (p.xix). Learning this information was startling, as I was transitioning into my first role of building principal at a primary K-2 building. This curiosity led to an inquiry of how and what students learn at a young age might result in them being successful later in life in whatever avenues he/she pursues. Therefore, I was concerned about how young students could begin preparing for the 21st-century world to be “ready” for high school success and beyond.

I have learned essential leadership lessons from having planned and completed this research project. I have learned that the implementation of curriculum starts from the top down. Administrators, principals, and school staff need to be supportive and fully committed to any school district change. As a building leader, I cannot implement change unless I am unconditionally supporting my school staff in their day to day responsibilities.

To ensure that our students are acquiring the skills needed to be prepared for the 21st-century world, first and foremost, we must look at the foundational skills that students learn in younger grades and how they are learning them.
ACKNOWLEDGMENTS

Often attributed to the American Founding Father, Thomas Jefferson, he quotes, “I am a great believer in luck, and I find the harder I work, the more I have of it” (“Thomas Jefferson’s Monticello,” n.d.). I am fortunate for the support and positivity that always comes my way. Big thanks to my cohort, the NLU faculty, and my support system of family and friends.
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CHAPTER ONE: INTRODUCTION

Now more than ever before, students need to develop 21st-century skills to ensure they can productively participate in our ever-changing, progressive world. Within schools, however, there lies a disconnect between how and what students learn and whether they can transfer the skills they acquire. According to Wagner (2008), the curricula, instructional practices, and assessments that students are responsible for completing "were created in a different century for the needs of another era. They are hopelessly outdated" (p. 8). Wagner (2008) believes, “there is a core set of survival skills for today’s workplace, as well as for lifelong learning and active citizenship--skills that are neither taught nor tested even in our best school systems” (p.14).

Wagner (2008) identified “Seven Survival Skills for the 21st century” as essential for individuals to succeed in modern society. These skills include being able to critically think and problem solve, collaborate, adapt, take initiative, effectively communicate, access and analyze information, and explore one’s curiosity (p.14-42). Wagner (2008) argues, “Parents and educators who do not attend to these skills are putting their children at an increased risk of not being able to get and keep a good job, grow as learners, or make a positive contribution to their community” (p.14).

To better prepare our students, Wagner has identified critical thinking and problem-solving as the first of seven survival skills that need to be taught to all students. Therefore, it is necessary to teach critical thinking to students in the early grades. Critical thinking includes teaching students to ask and answer clarifying questions, draw valid conclusions, and form one’s ideas based on their information. Students need to develop these skills while they are first
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learning to think, create opinions, and build their ideas from what they are learning. Research indicates that teachers need to encourage children to "become independent and productive readers, helping them to extend their reasoning and comprehension abilities in learning about their world. Teachers will need to provide challenging materials that require children to analyze and think creatively and from different points of view ("Learning to Read and Write," 2013). For students to be successful in this global world, they must go beyond the knowledge level of thinking. According to Dwyer, Hogan, and Stewart (2014), "Instruction in critical thinking is becoming exceedingly important because it allows individuals to gain a more complex understanding of the information they encounter and promotes good decision-making and problem-solving in real-world applications" (p. 1). From my own experience as an administrator in Fulton Park School District #383 (FPSD#383) (pseudonym), I have found that students need to start developing critical thinking skills beginning in the early primary grades of K-2. Starting young will prepare them to be successful later on in their educational career.

Education is more than students being able to repeat back what they are learning. Students need to know how to raise questions, think critically, interpret creatively, and think outside of “the box” instead of only accepting the information they are provided. Dewey (1933) cautions that if individuals teach for a means, they fail to allow students to learn how to think critically about the subject at hand (p. 118). Additionally, Dewey (1910) argues that an individual who thinks critically can rationalize beyond the present and consider the future. The individual who thinks critically can explain cause and effect, understand consequences, and organize their thoughts. A thinking individual is capable of evaluating prior problems and learning from history. Therefore, an individual who can think can learn and transfer their learning from one problem to another. Critical thinking allows students to make more
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collaborations and truly learn (Dewey, 1933). It is our responsibility as educators to prepare individuals to think critically about the world around them and to question ideas. Teaching critical thinking should be an important goal for all educators.

**Fulton Park School District #383**

Fulton Park School District #383 (FPSD#383) is a K-8 district located in Fulton Park, Illinois, about 30 miles southwest of Chicago. The district educates approximately 5,000 students, with a cultural diversity including White (72.7%), Hispanic (14.3%), Asian (5.8%), Black (4.5%), Multi-Racial / Ethnicity (2.5%). The English Language Learners (ELL) population is 11.1%, and our diverse learners, or students with disabilities, make up 16% of our student population. The economic factor shaping the community at FPSD#383 is that 16.7% of the student population is considered low-income (Illinois School Report Card, 2017). FPSD#383’s mission statement is: *Our mission is to empower students to be prepared for successful lives beyond the classroom.* It is vital to examine how we prepare our students to acquire the skills needed to succeed in the future.

With technology readily available in the district, there is an opportunity for students to use technology to develop and expand their skills in class. During the 2018-19 school year, FPSD#383 was in its fourth year of a 1:1 technology implementation where all students, K-8, had access to iPads and Macbooks in the classroom. However, at the K-2 level, this was only the second year that first and second-grade students had access to 1:1 iPads, which were kept in the classroom for student use every day. iPads are a 2:1 ratio for kindergarten grades, meaning one iPad for every two students, split for use between two classes. At present, the primary buildings in FPSD#383 continue to be at the beginning stage for using technology as the primary vehicle for learning and communicating with their students and parents. While some teachers in K-2
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grade levels are fully embracing technology and integrating it more readily than some of their colleagues, other teachers could use more support and coaching with integrating technology into their curriculum. With the district's ongoing technology integration initiative as a central focus across all schools, there is an opportunity at the primary schools to enhance how students are using technology to navigate their thinking and learning on devices to teach them to be critical thinkers. However, it is imperative first to examine teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2 to look for strengths in instruction and needs for professional development. Teachers need to identify how they teach their students' critical thinking skills and examine how students learn to ask and respond to questions, draw conclusions, and form their ideas based on their learning. It is also necessary for teachers to identify how technology integration can promote these critical thinking skills since the technology is readily available for all students at the K-2 level.

All students need opportunities to access and acquire the cognitive tools and strategies to think critically. Egbert (2017) defines critical thinking as 1) the ability to ask and answer clarifying questions to enable their curiosity, 2) draw valid conclusions, and 3) the ability to form one's ideas based on the information one has learned (paras. 3-4). When educating students on "how to think," while they are initially developing their thinking skills, teachers must have a sense of high self-efficacy as they promote teaching critical thinking skills in early primary grades. Through focused instructional practices on creating "critical thinkers," teachers can help their students navigate their thinking and learning through critical thinking skills.

**Purpose**

During the 2016-17 and 2017-18 school years, I served as an assistant principal at a 3rd to 5th-grade intermediate grade level center in FPSD#383. Students who transitioned from the
primary buildings (grades K-2) to the intermediate buildings were coming in without all the necessary cognitive skills and tools to enable their curiosity, the ability to ask and respond to higher-order questions on their own, and solve problems independently. My role as a brand new principal at one of the primary schools in FPSD#383, Morgan Elementary School, during the SY2018-19 school year, led me to design the current study. The purpose of the study was to examine the following questions: 1) what teaching strategies do primary teachers use in their teaching of critical thinking, 2) how do primary school teachers define critical thinking, 3) what do primary teachers believe about their students’ abilities to use critical thinking skills, and 4) what factors do teacher perceive as the barriers to improve critical thinking skills in primary learners?

When determining how to incorporate critical thinking into instruction, one can consider what instructional activities might lead to students actively engaging in the lessons presented and the level of cognitive work the student is asked to do. The relationship between student engagement levels in lower-order/surface learning and higher-order/deeper learning engagement varies. Lower-order thinking asks students to recall what they have learned by describing or explaining, either through verbatim of the teacher's words or by putting things into their terms. Lower-order thinking skills do not require students to interpret what they are learning or make a judgment or decision. Conversely, higher-order thinking includes all intellectual tasks that call for more than the retrieval of information. Higher-order thinking asks students to take new information, along with information previously stored, and extend their learning to solve a problem or achieve a new purpose.

Instruction that is intended to engage students in these higher-order thinking skills must be carefully planned out. Teachers need to encourage students to ask questions and solve
problems in non-conventional ways to engage their students more in this higher-order thinking and learning. Open-ended problems give students more opportunities to show their thinking and demonstrate their problem-solving skills. Additionally, when utilizing inquiry skills that translate to focusing on their thinking, students should interact in tasks that require them to observe, analyze information, and summarize their learning to make meaning. When planning for this instruction, teachers need to focus on tasks that will interest students and relate them to their own experiences so that students are more engaged in their learning, especially when asked to apply the thinking skills they have developed.

For this study, critical thinking is measured related to teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2. Insights gained from this study will be used to make recommendations to teachers and administrators to build critical thinking skills in primary grades through teaching strategies and technology integration. The integration of technology can help create an active learning environment in which teachers and students solve problems, ask questions, and find their problems. Bransford, Brown, and Cocking (2001) cite the research of (Greenfield & Cocking, 1996), stating, "Because many new technologies are interactive, it is now easier to create environments in which students can learn by doing, receive feedback, and continually refine their understanding and build new knowledge" (p. 206).

Rationale

As an administrator, I want to be an instructional leader that supports my teachers with the resources, time for reflection, and collaborative opportunities to develop our students to become critical thinkers. In turn, students will have a better chance of academic success in subsequent grades. By providing teachers with the time and opportunity to share with their colleagues during after school staff meetings and district-wide professional development,
teachers will have the option to attend and share their practices. Wagner (2008) argues that students need to learn critical thinking and problem-solving skills as soon as they can learn abstract thinking. Anecdotes and observations show that once students transition from the primary buildings to the district’s intermediate buildings, they do so without the tools to ask and respond to higher-order questions independently. It is vital to examine primary teachers’ perception, knowledge, and abilities in developing critical thinking skills in grades K-2. To understand the importance of teaching these skills while students are initially learning how to think as young students, professional development needs to be provided for all teachers.

Additionally, teachers need to feel supported with time for collaboration and the resources to teach students how to think, ask questions, and solve problems. Since FPSD#383 is a 1:1 district, in which there is one Ipad for every child, there is an opportunity to focus on how teachers utilize technology to teach inquiry skills that enable students to learn to think about how they are learning and how to ask critical questions.

Wagner (2008) argues that public schools in the U.S. “are not contributing significantly to this country’s capacity for creativity, imagination, and innovation” (p.75). When comparing the U.S. to other countries, like China, India, and Singapore, who are reconstructing their education systems to produce more creative students, the U.S. is not preparing learners in the same way. These other international educational organizations educate their students to be problem-solvers and active thinkers (Wagner, 2008, p. 75). The U.S. educational system needs to be preparing students with best practices to remain economically competitive with other countries.

**Goals**
This study investigated teachers' understanding of critical thinking, their beliefs about their students' abilities to use critical thinking skills, and what teaching strategies primary teachers use to teach critical thinking through various data collection modes. Additionally, focusing on how technology integration can promote these essential skills will provide information on how Morgan Elementary School can move forward with its 1:1 resources. Teachers will need to understand what is currently taking place during effective instruction and what strategies could further promote critical thinking. If teachers identify instructional activities that encourage students to utilize higher-order thinking skills while working independently and with their peers, teachers will share their own experiences through collaboration about which exercises can actively promote critical thinking during instruction.

**Research Questions**

My primary research question was, “What teaching strategies do primary teachers use in their teaching of critical thinking?”

To answer this question, I examined teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2. Additional exploratory questions included:

- **What are the current practices of primary school teachers when teaching critical thinking skills in their classrooms?**
  - How do primary school teachers define critical thinking?
  - What do teachers believe about their students' abilities to use critical thinking skills?
- **What teaching strategies do primary teachers use most frequently to encourage students to think critically?**
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○ What were the factors that influence the implementation of critical thinking instruction by primary school teachers in elementary schools?

○ What factors do participating teachers perceive as the barriers to improving critical thinking skills in primary learners?

Summary

According to Gallagher-Mackay and Steinhauer (2017), "Whatever you call them—twenty-first-century skills, employability skills or higher-order skills—the need to develop them among our students will have profound implications for the schools of the future" (p. 17). Therefore, there is a need to teach students a critical thinking mindset beginning in their primary years. When students learn how to think, ask questions, and draw conclusions from all of the information they are taking in, the teaching process must be explicit. Students need to know the importance of what, why, and how they are to learn. Teachers ultimately need the knowledge, resources, and training to educate students on thinking and asking/responding to reasonable questions as vital foundational skills. Wagner (2008) argues, "Parents and educators who do not attend to these skills are putting their children at an increased risk of not being able to get and keep a good job, grow as learners, or make positive contributions to their community" (p. 8). We are all ultimately responsible for our children's education and getting them there with the sufficient skills needed for their future.

By examining teachers’ perceptions, knowledge, and abilities about developing critical thinking skills in grades K-2, the results of this study will help administrators support classroom instructional practices that meet students' future needs. Supporting teachers with instructional strategies and online tools aligned with developing critical thinking skills in young children will allow them to acquire these skills early to prepare them for their future learning.
CHAPTER TWO: LITERATURE REVIEW

The purpose of this study is to examine teachers' perceptions, knowledge, and abilities in the development of critical thinking skills in grades K-2. Critical thinking is developing students' ability to ask questions, draw valid conclusions, and form one's ideas based on the information one has learned needs to be fostered in primary learners. According to Abrami et al. (2008), most educators acknowledge that learning to think critically is one of the most covetable goals as students begin their educational careers (p. 1102).

This review defines critical thinking skills and what it currently looks like in classrooms today. A brief history of critical thinking is explored to signify the importance of developing these skills in our young learners, and challenges to teaching these skills are identified. The instructional strategies that play a role in improving critical thinking skills are addressed. Educators can increase student engagement and mastery when teaching these thinking skills by integrating technology into their instruction. Once effective teaching strategies have been identified, the level of students' demonstration of having acquired these skills must be measured effectively.

Definition of Critical Thinking

There are several definitions or ways of thinking about critical thinking by leading researchers.

Critical Thinking: Defined as 1) the ability to ask and answer clarifying questions enable their curiosity, 2) draw valid conclusions, and 3) the ability to form one's ideas based on the information one has learned (Egbert, 2017, paras. 3-4). This definition of critical thinking was used for this study.
Paul and Elder (2006) define critical thinking as when the thinker enhances the quality of his or her thinking by analyzing, assessing, and reconstructing their thoughts. “Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking” (p. xxiii).

**A Brief History of Critical Thinking**

Throughout history, many educational theorists have conceived of critical thinking differently. Critical thinking can be traced back to over 2,500 years ago with the Greek philosopher, Socrates, who believed in the method of probing his students with questioning so that they would be rationally able to justify the knowledge they are claiming to have learned (Paul, Elder, & Bartell, 1997, p. 4). Rather than merely telling his students what to learn, he wanted to influence them to develop the skills to think for themselves and create their meaning of the knowledge they are learning (developing critical thinking). Socrates wanted his students to have the tools to shape their views and opinions of what they were learning. The Socratic method is a collaborative discussion that fosters inquiry by asking and answering questions to encourage thinking and draw out new ideas. Through this method of Socratic teaching, students learned to teach themselves with some guidance from the instructor. The goal is for students to analyze facts by exploring, creating, and participating to understand a topic. Ultimately, students need to develop their ideas and make connections to further their understanding of their learning.

In 1910, educational theorist John Dewey attempted to describe critical thinking in his book, *How We Think*. Dewey (2010) recognized the importance of teaching students to develop and acquire essential thinking skills. He argued that "Thought without proper reflection is uncritical thinking, and that to make better decisions, self-reflection is vital" (p. 3). Based on his ideas, critical thinking should be equivalent to students being metacognitive or thinking about their thinking. Dewey argued that students and the teacher are united together in the learning
community where ideas are created and discovered by thinking and not passively received. He stated, “In such shared activity, the teacher is a learner, and the learner is, without knowing it, a teacher” (Dewey, 1933, p. 160).

Dewey argues that student-centered instruction is a significant contribution to building the skills of critical thinking. Dewey (1933) persuades that “skill obtained apart from thinking is not connected with any sense of the purpose for which it is to be used. It consequently leaves a man at the mercy of his routine habits and of the authoritative control of others” (p. 152). Instruction must engage the “learner as a thinker” so that the learner does not acquire merely routine or “fixed habits” of mind.

Following this, Benjamin Bloom et al. (1956) created a hierarchical taxonomy that identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation. The three highest levels (analysis, synthesis, and evaluation) can be considered essential to think critically. After learning from and analyzing Bloom's work, Lorin Anderson, a former student of Bloom, and David Krathwohl, one of Bloom’s partners, revisited the mid-nineties’ cognitive domain. He made some changes to create Bloom's Revised Taxonomy (Appendix A): (1) changing the names in the six categories from noun to verb forms, (2) rearranging them as shown in the chart below, (3) creative processes and levels of knowledge matrix. Bloom's revised higher-order thinking skills (HOTS) suggest that some learning types require more cognitive processing than others and have more generalized benefits. Higher-order thinking involves "the learning of complex judgmental skills such as critical thinking and problem solving" (Burton, 2010, p. 1). Higher-order thinking or critical
thinking is considered useful since the skills of analysis and synthesis are usable in situations other than those in which the skill is learned (Burton, 2010, p. 1).

One of the most referenced definitions of critical thinking is attributed to Robert Ennis (1996), who stated, "Critical thinking is a process, the goal of which is to make reasonable decisions about what to believe and what to do" (p. xvii). Ennis argued that critical thinking is not an isolated thing or goal that stands alone. Instead, it is a process of making enlightened decisions based on what one is learning that affects how one lives his or her life, with the ultimate goal of living reasonably in the ethical sense of life. One's beliefs and actions guide the way they live and their contribution to their world around them.

In 1997, Dr. Norman Webb categorized activities and identified levels of thinking that each student should demonstrate, according to his Depth of Knowledge framework (DOK). DOK is a useful way to think about the complexity of students' tasks and how they should demonstrate their thinking levels. Teachers need to consider DOK when teaching students to think because it asks students to show different skill levels when encountering and working with new information learned (Aungst, n.d.). DOK levels include the following (Appendix B): Level 1 is recall; recall focuses on whether the student can recall a simple fact from a story. This requires a shallow understanding and no analysis of the information presented. Level 2 is skills and concepts; skills and concepts focus on whether the student can think beyond recalling a fact or information. Teachers might ask students to interpret, infer, categorize, compare and contrast, predict, apply, sequence a story or events, or reconstruct their thinking with the information they have learned. Level 3 is strategic thinking; strategic thinking focuses on whether the students can think beyond the text, connecting it to his/her world or another text, or for the possibility of creating something new. To do this, students might explain, generalize, or connect ideas from one text to another.
Additionally, students might analyze information, form their own opinions, and then explore them. Level 4 is extended thinking; extended thinking focuses on students taking information from two or more sources and applying the information learned to a new task that requires more complex thinking.

Daniel Fasko (2003) provides his definition of critical thinking by stating, "Critical thinking is the propensity and skills to engage in activity and 'mental activity' with reflective skepticism focused on deciding what to believe or do, 'and that can be justified'" (Fasko, 2003, p. 8). Fasko argues that a real critical thinker would not merely accept conclusions without asking questions and seeking reasonable answers and solutions.

Critical thinking is believed to be one of the most regularly discussed skills in education. It is central to other needed skills such as reasoning, making decisions, creating and defending arguments, and solving problems (Ventura, Lai, & Dicerbo, 2017, p. 5). Some may argue that critical thinking skills might not be necessary for students to acquire until they are older. They can reason independently and independently develop arguments with credible evidence to support thoughts. Primary age students in grades K-2 must create these critical thinking skills while initially learning how to ask questions and bridge their current thinking to new ways of thinking. If students acquire these thinking skills and make connections to new ideas early, they will be more efficient or successful. These skills are essential for students to acquire since "they allow students to deal practically with problems of a social, mathematical, and scientific nature. It empowers them to make effective and level-headed decisions in their lives and relationships" (Watanabe-Crockett, 2016, p. 6). Ultimately, it does not matter students' age, from preschoolers to college-age students; all students can use strategic and extended thinking tasks according to Bloom's Revised Taxonomy and Webb's DOK. Critical thinking may take different forms,
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depending upon the grade level will differ from others. However, all students should have the opportunity to do complex reasoning and develop these skills to make them ready for success when they get to higher grades.

**Importance of Improving Critical Thinking**

There is an urgency in the teaching and learning of critical thinking skills in students. Since the 1990s, there has been a focus on improving critical thinking in the classroom. President George Bush established Goals 2000, which targeted critical thinking as a national educational goal (Siskin, 2003). Additionally, the Department of Education mandated competence in critical thinking for all college graduates by the end of the century (Education, 2004).

On March 10, 2009,

President Obama said, 'The solution to low test scores is not lower standards; it's tougher, clearer standards,' …He urged states to develop standards '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, entrepreneurship and creativity. (Paul & Elder, 2006, p. 6)

Elder (2014) suggests that while humans reason naturally, thought can often be irrational or unreasonable. To think critically and logically is crucial, and students need to be taught to infer, analyze, synthesize, compare, contrast, plan, and evaluate. Educators cannot assume that individuals can inherently think critically; instead, it should be assumed that critical thinking can be taught.

The initial stage of critical thinking should be introduced and fostered at the elementary level (Ricca, Lulis, & Bade, 2006), followed by retaining and further developing the critical thinking concepts in secondary school (Snyder & Snyder, 2008), and consistently practiced at the
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college and university levels (Halpern, 1999). According to Choy and Cheah (2009), one of the continued arguments in education research regards "whether students can learn to think critically through their own exploration or whether they need to be formally taught the skill as part of the curriculum" (p. 198). Curiosity and imagination can make learning more effective and enjoyable for some. Allowing students to see where their curiosity takes them can be enough to start their inquiry about the world around them.

Others believe that teachers must utilize specific strategies when teaching critical thinking skills to young students. The lack of preparation, both in preservice and in-service professional development, causes many of the problems in teaching critical thinking within the classroom. Thomas (1999) states that "teachers need to be educated in the standards, intellectual traits, skills, and processes of critical thinking in their preservice education" (p. 132). Without teachers having the appropriate prerequisite knowledge of teaching critical thinking within the classroom, it is impossible to implement in the classroom. Despite the perceived consensus for increased critical thinking skills, Choy and Cheah (2009) found little evidence that it occurs, and the growth displayed by students remains low.

This research seeks to explore one question: why are critical thinking skills not consistently taught at an early age? Research supports that when students begin formal schooling, critical thinking skills should be introduced. According to Wayne (2008), "Even kindergarten students can learn to distinguish and appreciate the different perspectives of different characters in a simple story and to think about the point of the story" (p. 2). Brady (2008) found that most students show up for kindergarten already making routine use of higher-order thought processes. They do not need to be taught to think; they need to learn how to
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examine, elaborate, and refine their thinking ways and put this thinking to deliberate use by converting information into knowledge and knowledge into wisdom.

**Challenges to Teaching Critical Thinking**

One of the stated goals of education is to improve critical thinking skills in the student (Obama, 2014); however, some challenges must be considered. Research by Paul and Elder (2009) suggests that a significant factor in our students' inability to think critically is how they are taught. Most educators do not know what critical thinking is or how to teach it. Unless teachers intentionally plan their lessons to explicitly build their students' critical thinking skills and receive training in teaching them, their students do not improve their skills (Abrami et al., 2008).

Sousa (2001) argues that schools today rely upon more students understanding the content presented to them rather than learning to think for analysis and synthesis. Understanding presented content requires learning at nothing more than the lowest levels of comprehension. As teachers attempt to teach students "how to think," the students ultimately are being treated as "vessels to be filled" (p. 249). Sousa (2001) mentions that some critics and educators believe that young human beings "do not think and need to be taught" (p. 248). Sousa argues in opposition that we begin to think from birth. He claims that what can be taught are skills to organize content such as critical attributes and apply more creative thinking skills.

Paul (1985) states that teachers' perceptions, attitudes, and behaviors sometimes constrain critical thinking skills. Some teachers feel that students lack the necessary background knowledge to develop critical thinking skills or believe that building these skills is too time-consuming against the constraints of what must be taught within their curriculum. By
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recognizing the importance of critical thinking skills and the perception of students not having these skills, there is a need to increase teaching and learning.

**Pedagogy to Improve Critical Thinking Skills**

The methods that teachers utilize to deliver their instruction must evolve with how students learn. Research supported by Brady (2008) argues that for many people, “The main purpose of educating isn't to improve students' thinking skills but to "cover the material" in math, science, language arts, social studies, and other school subjects” (p. 64). Students often passively listen in the classroom while teachers present information (Freire, 2005, p. 72). According to the Center for Curriculum Redesign, one of the main challenges of teaching critical thinking is "the successful transfer of critical thinking skills to contexts outside the one in which they were learned" (Center for Curriculum Redesign, 2015, p. 8). Students need to be allowed to learn beyond the information the teacher is delivering to them. Research by Abrami et al. (2008) supports that, "As well as being better students, a short-lived advantage, critical thinkers have a better future as functional and contributing adults" (p. 1103).

McGee (2004) found that “deeper learning engages the learner who actively explores, reflects, and produces knowledge rather than recalls and regurgitates” (p. 1). According to Choy and Cheah (2009), “For students to think critically and learn actively, teachers must give up the perception that students cannot learn unless a teacher covers it.” (p. 198). Prensky (2011) supports that schools need to look at "how" we teach and "what" we teach. Changing the "how" means implementing instructional practices that work for today's students; changing the "what" means revising a curriculum that is not only useful and challenging to students but also focuses on the future and keeps students engaged (Prensky, 2011, p. 6).
Teachers can teach classroom behaviors, such as active listening, to support students in building their critical thinking skills when learning information for the first time. “Active listening provides critical thinkers with what is needed to organize the information they hear, understand its context or relevance, recognize unstated assumptions, make logical connections between ideas, and draw conclusions” (“Active Listening,” p.2008). Students are taught to listen to others' ideas and arguments without having a predisposed viewpoint or idea for students to be active listeners. Active listening requires students to hear another perspective, take in that information, and analyze it to form their opinions on the subject. In turn, students analyze the information by breaking down the information they are learning and forming an opinion representing their understanding.

To give teachers the chance to share ideas for effective teaching to occur, teachers need to have the opportunity to learn from one another through collaboration (Marzano & Heflebower, 2012). Working together allows teachers to form meaningful personal and professional relationships. Through collaboration, teachers can draw support from one another, contributing to student success and school improvement. According to Mednick (2004), "As teachers feel less threatened and more comfortable with sharing their work, they gradually become willing to try new strategies and reflect on how it went" (p. 3). Creating a school culture that encourages teachers to be risk-takers and share instructional ideas is essential. Suppose teachers invite others into their classroom to observe and provide informal feedback. In that case, this results in teachers giving each other more instructional ideas and strategies and more opportunities for them to talk about teaching and learning. Ultimately lessons will become better, instruction more dynamic, and student learning more meaningful.
Teaching Strategies That May Enhance Critical Thinking

There is a need for meta-cognition in the act of critical thinking. Paul (2007) states, "Critical thinking is thinking about your thinking, while you're thinking, in order to make your thinking better" (p. 1). To think critically means to raise what you are thinking to a higher, more advanced level. It is the quality of thought that is important for the thinking to be aware of and control one's beliefs and decisions.

To have a "critical thinking mindset" means to be mindful, reflective, and metacognitive (Facione & Facione, 2013, p. 7). Having that critical thinking mindset allows an individual to develop their ability to connect new knowledge to previous knowledge, construct and evaluate arguments, and solve problems. While students are developing these initial thinking skills as young learners, teachers need to encourage their students to develop a critical thinking mindset while they learn.

Instructional strategies that teachers implement in the classroom play an important role in students' learning. Many teachers might think they are helping students think critically. However, they could be focusing solely on the students' comprehension of the subject matter rather than diving deeper to form one's idea about what one has learned. Teachers should choose effective teaching methods that extend student learning well beyond the presented information.

Critical thinking is a process that develops over time and requires consistent reinforcement in the daily lessons of student learning. According to Abrami et al. (2008), "Improvements in students' critical thinking skills and dispositions cannot be a matter of implicit expectation... educators must take steps to make critical thinking objectives explicit in courses" (Abrami et al., 2008, p. 1121). Richards’ (2005) study found the following:
Teachers who actively engage students use hands-on lessons that require students to use multiple learning skills and higher-order thinking to construct meaning and knowledge. Such activities often require students to merge their personal experiences with new concepts and skills. Based on student readiness, interest, or learning profiles, teachers may also provide differentiated instruction by adjusting the content, process, required products, or learning environment to accommodate learners' variance. (p. 2)

When planning instruction, teachers must present their teaching with clear expectations for students to know and understand why they are learning the concept being taught. Students should be encouraged to apply what they learn immediately and connect it to an action or construction of something new during instructional lessons. Per Darling-Hammond (2008), teachers should incorporate four principles when planning their curriculum: 1) Teach students to question all sources, 2) Give students authority to debate and have productive conflict, 3) Hold students responsible for addressing the viewpoints of others and helping others learn, and 4) Provide students with a variety of relevant resources (Darling-Hammond, 2008, p. 32-34). These four principles allow students to develop the needed critical thinking skills. Additionally, DeFrondeville (2009) supports that when teachers use questions and problems that allow for multiple strategies to reach a successful outcome, students are allowed to make choices and then compare their approaches. This strategy challenges them to operate at a higher level of thinking than when they can share only the correct answer (p. 1).

There are many quick and straightforward strategies that teachers can implement to help students build a foundation for critical thinking. Providing younger students with play opportunities allows them to use their curiosity and imagination. When asking questions, teachers should remember to ask open-ended questions and include Webb's Depth of Knowledge
(DOK) question stems (Appendix C) as students collaborate in discussions with their peers (Francis, 2017, p. 30). When a teacher pauses and waits for students to develop an answer rather than providing a general response, they must think about what they are being asked. When collaborating with peers, having students work through a problem and asking their peers questions helps them extend their learning rather than a teacher intervening immediately. Lastly, assisting students in developing hypotheses by asking them to predict what they think will happen causes them to extend their learning from what they already know to what could happen. These quick strategies can be incorporated into any content area daily.

**Technology Integration and Acquisition of Critical Thinking Skills**

There is a great need for creating technology-rich environments within the classroom. Research by Blair (2012) supports that this type of “technology-rich” environment involves students’ ownership and accountability of their learning. Teachers need to put technology into students’ hands increasingly, and teachers must trust students with the continuous use of this developing technology.

Carlson and Gadio (1999) report:

Even if students could learn independently how to use technology to enhance their learning and skills development, with little or no involvement from their teachers, they are highly unlikely to have those opportunities if teachers do not let them have access to technology. (p. 119)

Teachers need to give students access to technology to enhance students' creativity and foster critical thinking skills.

For technology integration to be successful, teachers should view technology as a vehicle to deliver the learning that is already taking place in the classroom (Kolb, 2019). However, this is
not always the case in practice. Despite technology being more prominent in school, teachers seem to be using it to supplement their traditional instructional strategies (Cortez, 2016). According to Cortez (2016), "The vast majority [of teachers] reported that tech is used for interactive projects and collaboration only a few times a week, month or year" (p. 2). When teachers utilize digital learning, it encourages critical thinking by offering learners more options for applying the skills they have acquired and what they know. Students can showcase their knowledge through multiple and varied representations of the concepts or tasks at hand.

The most crucial factor for successfully integrating technology in the classroom is "the teachers' competence and ability to shape instructional technology activities to meet students' needs" (Gorder, 2008, p. 63). This can be done by creating interactive learning opportunities for students to collaborate to make meaning of what they are learning. Abrami et al. (2008) argue that collaboration among students while developing critical thinking skills appears to provide some advantage for their learning (Abrami et al., 2008, p. 1121). This student-centered learning allows students to find information, use resources and technology, and create meaning from their knowledge. Through technology integration during instruction, students stay engaged in the learning that is taking place.

Use of technology assists teachers in individualizing learning for the students. Research by Carlson and Gadio (1999) supports that technology can promote effective instruction focused on student-centered, more closely related to real-life events and processes, and adaptive to individual learning styles (p. 120). Shifflet and Weilbacher (2015) argue:

Student-centered approaches, which are often associated with constructivist principles (Bruner, 1993; Vygotsky, 1978), are designed to allow students more choice and control
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in the content to be learned, processes used to understand the content, and products
created to demonstrate mastery (Richardson, 2003). While teachers use technology to
access and manipulate data, gather resources, and enhance instruction, teachers who
support student-centered instruction fully understand that in the hands of their students,
technology offers the potential to problem solve in a real-world context (Lajoie, 2000)
and to construct knowledge through global interaction. (p. 3)

Real-world application of problems makes digital learning more meaningful since students apply
the skills they acquired to scenarios that cause them to extend their thinking.

In the progressively digital world we live in, students can access many technologies
outside of the classroom and know how to navigate these devices often better than adults.

According to Carlson and Gadio (1999):

Youth acquire technological skills far more quickly than adults, and they are far more
likely to share their skills with their peers (either deliberately or simply through
interaction). Rather than seeing this as a threat to their authority, teachers should embrace
this reality and use it to their advantage. (p.124).

Students can act as a resource in their classroom for their teachers and help their peers with
technical support. Teachers can incorporate video and multimedia into daily lessons and provide
students with various ways to produce or demonstrate their learning. Students can access
numerous apps and programs that can extend their learning of content being taught or practice
skills individualized to their learning styles. Critical thinking skills are utilized through digital
resources and tools as students transfer their knowledge from one concept to another.
Measurement of Student Acquisition of Critical Thinking Skills

According to Abrami et al. (2008), understanding how critical thinking is measured is just as important as comprehending how critical thinking can be taught and learned (p. 1104). When teachers incorporate a broader use of performance assessments that encourage critical thinking and performance skills in their instruction, they can better assess what and how students construct their learning (Abrami et al., 2008, p. 210). According to the Partnership for 21st Century Learning (P21), performance-based assessment is a valid measure of critical thinking (2018, p. 7). When assessing critical thinking skills (such as asking probing questions, drawing valid conclusions, or forming one’s own opinion, teachers need to assess it is essential the skills that the students can perform rather than regurgitate rote information that teachers provide to students. Students should have access to real-world scenarios and complete tasks that are open-ended to reach a solution or answer in any approach they choose. To assess critical thinking skills in the classroom, teachers might ask leading questions to draw information from the questions, make inferences, or form predictions about a topic. Unfortunately, critical thinking is not commonly assessed at these primary grade levels.

Summary

To contribute and participate efficiently as an educator in society, teachers must plan their instruction and utilize strategies that effectively teach students how to communicate, collaborate, be creative, and think critically. Students need to develop these skills as early as possible in their formal education while they are initially learning how to think for themselves. Encouraging collaboration among teachers to share teaching strategies and ideas for using technology in the classroom can increase their skill integration and the opportunities to teach these skills within their instruction. Gorder (2008) found that "Active learning using technology involves student
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interaction with the content that allows knowledge building and construction” (p. 64). Students are often more capable and savvier at navigating technological devices and can often help their peers and teachers in the classroom.
CHAPTER THREE: METHODOLOGY

This study examines teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2. It is essential to identify how primary teachers define critical thinking, their beliefs about students' abilities to use critical thinking skills, and what teaching strategies primary teachers currently use to teach critical thinking skills. Teachers who hold high expectations for what their students can learn influence the instruction they create and implement within their classroom.

Teacher efficacy, or confidence in their abilities, is significant and students depend on their teachers to develop the skills needed to become successful learners.

Since the school district in this study utilizes 1:1 technology across schools, this technology can support teachers as they plan and develop instruction that allows students to acquire these critical thinking skills. More professional development, resources, and support are needed for teachers to create instructional activities to develop critical thinking skills to make students better questioners and thinkers overall. The available use of technology at each grade level can support teachers as they teach their students to develop these skills.

Research Design Overview

According to Patton (2008), "Evaluation use can be enhanced by actively involved intended users in decisions about the evaluation purpose, scope, and focus to ensure relevance and buy-in" (p. 384). Teachers and students in their daily classrooms are involved in determining trends of how higher-order thinking is taught. The evaluation of learning strategies is useful to teachers individually, by grade level, and by the school. This information can assist the school district when determining instructional materials and their scope and sequence in which critical thinking strategies are laid out over each grade.
Additionally, according to Patton (2008), it is essential to reference Kipling's Conceptual Framework when determining how a researcher will measure the data for an evaluation. To help make evaluation measurement focused, the researcher must consider 1) What do I want to find out? 2) Why do I want to find that out? 3) When do I need the information? 4) How can I get the information I need? 5) Where should I gather the information? and 6) Who is the information for and from whom should we collect the information we need (Patton, 2008, p. 393).

This study used an exploratory sequential design that included qualitative data collection, collected through an online survey and semi-structured interviews (Creswell, Plano Clark, et al., 2003, p.77). The data analysis helped the researcher understand teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2. As an outcome of the study, the researcher used various descriptive statistical analyses, such as examining central tendency measures such as means, estimates of variance, e.g., standard deviations and correlational analyses.

The researcher seeks to present the study’s findings to the school community by providing learning opportunities for teachers to collaborate and share instructional activities that target critical thinking and how they can be taught in K-2 grades. Additionally, a recommendation will be made for a "toolbox" of instructional activities that teachers and other principals at primary buildings can utilize when teaching critical thinking skills. This toolbox includes teaching strategies, such as utilizing Webb's DOK question stems throughout small group discussions, teaching students how to be active listeners, and integrating technology within lessons to extend students' development of critical thinking skills. Understanding a baseline of where teachers are with teaching critical thinking and developing those skills in their learners will propel a change in teachers’ beliefs that all students can develop these crucial skills.
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Participants

In the first phase of the data collection, 28 participants from Morgan Elementary School in Fulton Park School District #383 (FPSD#383) were invited to complete an online survey. These participants included 15 K-2nd grade teachers, three resource teachers, four self-contained teachers, two ELL teachers, three interventionists, and one enrichment teacher. The participants were all female, ranged in age from 23-60 years old, and had varying years of teaching experience, ranging from 1-32 years, in grades K-2. The second phase of the data collection involved one-to-one interviews with eight teachers based on an analysis of the survey trends in participants’ responses. The data trends that prompted the interview questions included limited time, limited resources, and lack of knowledge in teaching critical thinking skills at this age. To get a diverse view of teachers' perceptions of teaching critical thinking in the classroom, the researcher communicated to all participants that the survey was anonymous and would only be used to gather information regarding individual teacher perceptions of what teachers know about critical thinking and how young learners best acquire those critical thinking skills. When the researcher contacted the potential teacher interviewees, she provided a written explanation of the invitation to participate and emphasized that the interviews were voluntary. The researcher made it clear that the interviews were strictly voluntary and that choosing not to participate in the research would not have any negative consequences.

Data Gathering Techniques

The researcher used an exploratory sequential research design, including qualitative data collection through an online survey and semi-structured interviews with teacher participants.
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

**Survey (Appendix D)**

The first phase of data collection involved completing an online survey through a Google Form application. Participants were asked 19 Likert scale type questions and five open-ended questions related to their understanding of critical thinking and how it is taught in particular instructional strategies in K-2 grades. Some open-ended questions about critical thinking and several survey items were designed to collect necessary information about the participant. Data collected from the survey included quantitative descriptions of each response and qualitative analysis of the open-ended questions.

**Interview (Appendix E)**

After analyzing the survey for trends in responses, the second phase of data collection involved one-to-one interviews of 3-5 participants in obtaining more of an in-depth understanding of specific strategies teachers utilize to teach critical thinking skills. The questions posed in the interviews addressed the teachers' perceptions as discovered in the survey in phase one of the research, such as limited time, limited resources, and lack of knowledge in teaching critical thinking skills. The interviews were recorded using a digital recording device and were transcribed by a professional transcription service. Transcripts from the interviews produced keywords coded and further analyzed to see what types of themes or patterns emerged.

**Risks, Benefits, and Ethical Considerations**

Participants of this study were provided a consent letter to sign before participating in the study. The consent letter detailed (1) a description of the study, (2) participant's role in the study, (3) assurance of confidentiality, (4) survey and interview information, and (5) participant's contact information. All of the responses remain confidential. Only Dr. Angela Elkordy, the dissertation chair, and the researcher had access to any demographic information to identify the
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

participants. Additionally, data collected from the interviews were kept confidential. The audio recordings were not used for any reason outside of the research and were deleted upon completion of the study. Participation in this study was voluntary. Participants were free to decline to participate, end the involvement at any time for any reason, or refuse to answer any particular question. Refusing to participate involved no penalty. Participation was autonomous and not coerced, and it was important for participants to understand that the data collected from the interviews were kept confidential and utilized only for this study. Digital audio recordings of the interviews were uploaded to and stored on the researcher’s laptop, password protected. The audio recordings were not used for any reason outside this research. No participant names appeared in the transcripts or the analysis of the study findings' data and report.

Data Analysis Techniques

Data analysis for this program evaluation focused on qualitative data and descriptive statistics. Once the data set was complete, the researcher used various descriptive statistical analyses, such as examining central tendency measures such as means and measures of variance (e.g., standard deviations and correlational analyses). The researcher analyzed the survey data by looking at the responses from surveys and saw what common themes emerged from the similarities and the data trends in the survey responses. Additionally, the researcher utilized excel spreadsheets to code the interviews conducted with the teacher participants to look for common themes and descriptions of their perceptions of the various questions they answered. The researcher attempted to identify all interesting variables upfront by looking for emerging themes within the data set.
Summary

In conclusion, the data will inform the creation of a critical thinking toolbox of strategies that will be shared and made available for FPSD#383 teachers who are interested in increasing their instructional strategies for teaching critical thinking. Teachers in FPSD#383 need to feel supported with training and resources to lead to better instructional practices. The end goal is for teachers to provide instruction that allows students to access the necessary skills to be successful in the 21st century.
CHAPTER FOUR: RESULTS - ASSESSING THE 4C’s (“AS IS”)

This chapter presents the results and the data analysis collected from the sample of teachers from Morgan Elementary School in Fulton Park School District #383 (FPSD#383). Data was collected through a mixed-methods study consisting of two phases: 1) an online survey (Appendix D) and 2) interviews (Appendix E). Both the interview and survey data collection methods provided participants the ability to maintain their confidentiality when responding. The information collected provided an understanding of teachers' perceptions, knowledge, and abilities in developing critical thinking skills in grades K-2. Insights gained from both phases of this study were used to make recommendations to teachers and administrators to improve teaching critical thinking skills in primary grades. The topics in this chapter include an introduction to the 4C’s framework, the descriptive statistics of the survey responses, themes and reflective responses from the interviews, interpretation of the results using Wagner’s 4C’s framework (Wagner et al., 2006) to analyze the implications of the findings, and a chapter summary.

Introduction to the 4C’s Framework

To effectively achieve change, it is necessary to consider all of the elements in a system that needs to be changed. Working with the Change Leadership Group, Tony Wagner's work requires analyzing a system categorized into "4C's": context, culture, conditions, and competencies (Wagner et al., 2006, pp. 99-104). Wagner et al. (2006) state, "What is needed is an analytic framework for understanding the interrelated parts or elements of the change process in schools and districts" (p. 98). To begin an analysis of Fulton Park School District #383 (FPSD#383)’s 4C’s, it is significant and necessary to define where the district currently stands with these different components (Appendix F).
At first, the researcher analyzed whether teachers at Morgan Elementary School had a thorough understanding of what critical thinking meant and how they implemented higher-order thinking skills in primary grades, beyond merely teaching the content supported by the district-wide curriculum. Additionally, the researcher identified whether a robust positive culture existed within Morgan Elementary School and the district itself to support the implementation of critical thinking training. All stakeholders must understand the "arenas of change" for a district to transform. Wagner et al.’s (2006) theory is that “student achievement will not improve unless and until we create schools and districts where all educators are learning how to significantly improve their skills as teachers and instructional leaders” (p.23). Lastly, the researcher determined if FPSD#383, as a district, could provide the support, resources, and training for teachers needed to develop critical thinking skills in early learners at the primary grade levels, which in turn would improve student learning overall.

Table 1

**Context – As-Is**

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• One primary school (among ten schools in one district).</td>
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<tr>
<td>• District-wide curriculum for all core content areas.</td>
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<tr>
<td>• District focused on balanced literacy and the workshop model for the instruction of ELA and Math.</td>
</tr>
<tr>
<td>• The delivery of traditional teacher-led instruction for all students is still somewhat present.</td>
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<tr>
<td>• Teacher understanding of the definition of &quot;critical thinking.&quot;</td>
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<tr>
<td>• Teacher belief that critical thinking skills are essential for all students to learn.</td>
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<tr>
<td>• Teacher knowledge of Bloom’s Taxonomy/Webb’s Depth of Knowledge (DOK).</td>
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</tbody>
</table>
Table 2

**Culture – As-Is**

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Expectations that all students can learn.</td>
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<td>• Varying parental involvement amongst school families.</td>
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<tr>
<td>• Teacher beliefs about the importance of teaching critical thinking skills in early grades.</td>
</tr>
<tr>
<td>• Teacher uncertainty for how to implement critical thinking skills during core content instructional time.</td>
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<tr>
<td>• The inconsistent view that &quot;all&quot; students can perform higher-order thinking (HOT) skills.</td>
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<tr>
<td>• Lack of time spent on teaching critical thinking skills.</td>
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<td>• Teacher flexibility with instruction.</td>
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<tr>
<td>• Teacher willingness to apply new strategies within their daily lessons.</td>
</tr>
<tr>
<td>• Lack of student background knowledge to assist with developing critical thinking skills.</td>
</tr>
</tbody>
</table>

Table 3

**Conditions – As-Is**

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lack of significant professional development for developing critical thinking skills.</td>
</tr>
<tr>
<td>• Insufficient time for developing critical thinking activities and collaboration amongst teachers to share resources/instructional ideas.</td>
</tr>
<tr>
<td>• Lack of time spent on teaching critical thinking skills in class.</td>
</tr>
<tr>
<td>• The technology available (1:1 Ipads and abundance of apps that available to students and teachers).</td>
</tr>
</tbody>
</table>
Table 4

Competencies – As-Is

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Teacher efficacy is needed to develop essential skills in student learners.</td>
</tr>
<tr>
<td>● Teacher’s lack of confidence in teaching these skills.</td>
</tr>
<tr>
<td>● Lack of foundational skills or background knowledge for students to build upon skills.</td>
</tr>
<tr>
<td>● Inconsistent implementation of critical thinking skills during instruction.</td>
</tr>
<tr>
<td>● Traditional instructional practices are utilized, causing teachers to &quot;reteach brain&quot; how to be a critical thinker.</td>
</tr>
</tbody>
</table>

Context

In Wagner et al.’s (2006) description of the 4C’s framework, context (Table 1) is “the ‘skill demands’ all students must meet to succeed as providers, learners, and citizens, and the particular aspirations, needs, and concerns of the families and community that the school or district serves” (p. 104). As student skill demands increase, schools and districts must reevaluate how they implement instruction and what specific skills are taught in the classroom. Schools and districts are responsible for finding ways of engaging students and retaining their attention in our fast-paced environment; this is necessary for students to participate in active discussions and acquire the critical thinking skills needed to contribute to society later in life.

For students to meet the demands necessary for them to be successful at their grade level and contribute to forming their ideas, students must develop critical thinking skills. These critical thinking skills enable students to comprehend the information they are learning to create ideas, generate questions to further their understanding, and express their thoughts to expand upon them. Since students in early primary grades (K-2) are learning to truly think for themselves and connect ideas from the abstract to make them concrete, teachers need to provide their students the opportunity to ask questions critically, problem-solve, and form their thoughts based on what
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

they are learning. The “game” of school is mastered when a student can answer or recite back what teachers lecture about or deliver during rote instruction. However, in-depth learning involves more than reciting back answers. Therefore, students need to develop and build critical thinking skills with their teacher guiding and modeling for them.

Teachers have traditionally utilized the same instructional practices at Morgan Elementary School that they learned during their teacher preparation programs; some having completed those programs two to three decades ago. Even though students learn in different ways and come to school with varying needs, instructional practices have not necessarily evolved with those changes. While teachers at Morgan Elementary have been introduced to Webb’s Depth of Knowledge, the question remains: how often are the teachers utilizing critical thinking strategies within their instruction for students to develop and access critical thinking skills in primary grades?

The data collection goal was to identify the self-perception of teachers’ ability to promote critical thinking skills in primary grades K-2. Of the 28 teachers invited to participate from Morgan Elementary School to complete the online survey, 18 participated, resulting in 64% of those invited initially. Participants included K-2nd grade-level teachers, resource teachers, self-contained teachers, ELL teachers, interventionists, and an enrichment teacher. Of the 18 survey respondents, all are female, range in age from 23-60 years old, and have varying years of teaching experience in grades K-2; three of the respondents (16.7%) have taught for 1-6 years, three of them (16.7%) have taught for 7-15 years, and 12 respondents (66.8%) have taught for 16+ years. The most experienced teachers taught first and second grades (Figures 4.1 and 4.2).
Teachers’ Definition of Critical Thinking

Critical thinking has been identified as a critical skill that fosters innovation and is also necessary for a person to succeed in life. Critical thinking can lead to developing reasoning, judgment, evaluation, and problem-solving skills (Burton, 2010, p. 1). Therefore, students who
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

develop critical thinking skills become more self-directed, independent learners (Paul & Elder, 2006, p. xxiii).

When asked: How do primary school teachers define critical thinking?, 18 out of 18 survey respondents (100%) thought that critical thinking includes all of the following three characteristics: 1) ability to problem solve, 2) ability to ask and answer clarifying questions, 3) ability to form own ideas based on the information one has learned (Figure 4.3).

**Figure 4.3**

*Teachers’ Definition of Critical Thinking*

During an interview, one self-contained special education teacher responded to the definition of critical thinking by stating, "When I think of 'thinking,' it is more like the basic level of Blooms [Taxonomy]. . . you need the basic level to then be able to get farther." The special education teacher expanded on her thought by further stating, "I think it is for a student. . . to really apply what they are thinking and be able to use all of those skills and tricks that you have learned along the way and be able to problem-solve or research something to figure out." Students need to have the opportunity to develop skills they are learning in a practical way that
will make more sense. One needs a basic level of understanding before being able to build upon their knowledge of something.

During her reflection on what critical thinking means, one reading interventionist elaborated, "[Critical thinking is] a scaffolding process that you start with simple type of thinking skills and then move forward to a higher level [thinking skills]. . . There is just an element of deeper thinking, not just answering those "right there" questions. Being flexible with the way they think.” Furthermore, the self-contained special education teacher agreed that one needs to build on other skills to move forward. She explained, “You have to have something to build on. You have to have those ‘right there’ questions to then be able to push them [students] further.”

Adding her understanding of critical thinking, one math interventionist explained:

For me, [critical thinking is…] problem solving as far as word problems, being able to explain why they were able to use that strategy and how they were able to come up with their answer and then being able to kind of talk through the problem, like their processing.

She continued to reflect, “Critical thinking, in my opinion, would be getting them [students] to feel comfortable to ask questions or to think a little deeper or be able to take a story and kind of make it their own or be able to apply it to other things.” The teachers surveyed and interviewed emphasized their understanding that critical thinking skills are built upon, or scaffolded, once you have a basic knowledge of something. If students at this young age do not have the opportunity to build upon their necessary skills being learned, how do we, as educators, know they are genuinely learning what is being taught?
Culture

In his description of the 4C’s framework, Wagner et al. (2006) identify culture (Table 2) as “the shared values, beliefs, assumptions, expectations, and behaviors related to students and learning, teachers and teaching, instructional leadership, and the quality of relationships within and beyond the school” (p. 102). The culture within FPSD#383 deserves exploration since the district and its ten individual schools expect that all students will be high achieving. In particular, the district and Morgan Elementary School would like to convey the message that they support their teachers with the tools, resources, and knowledge of developing these critical thinking skills in students. It is essential to ensure that students are supported by parental involvement, both in school and at home.

Teachers’ Beliefs About the Importance of Critical Thinking Skills

One distinct theme that appeared throughout the data analysis of the survey and interview results focuses on the teachers’ beliefs about how important it is to develop critical thinking skills in their students, especially at this young age of grades K-2. Teachers understand that their students use these skills every day to make both good and bad decisions. Teachers also know that students use critical thinking skills to think creatively, think “outside of the box,” and solve problems.

When asked: What do teachers believe about their students' abilities to use critical thinking skills?, 13 of the survey respondents (72.2%) strongly agree, and five respondents (27.8%) agree that it is vital for them, as educators, to develop their students' critical thinking skills (Figure 4.4). Additionally, the majority of teachers surveyed (88.9%) disagree with the idea that there is no need to spend time on building these critical thinking skills at this young age; five respondents (27.8%) strongly disagree, and 11 respondents (61.1%) disagree (Figure
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

4.5). The majority of teachers surveyed (77.8%) agreed, 13 respondents (72.2%) strongly agreed, and one respondent (5.6%) agreed with the idea that critical thinking is essential in the grade level that they teach (Figure 4.6). Through the researcher’s analysis of the data, it was discovered that all teachers unanimously believe that it is part of their job to develop students’ critical thinking skills. These educators also value the time that must be spent during instruction to build upon these skills.

**Figure 4.4**

*Importance of Developing Students’ Critical Thinking Skills*

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - Strongly Agree</td>
<td>72.2%</td>
</tr>
<tr>
<td>4 - Agree</td>
<td>27.8%</td>
</tr>
</tbody>
</table>

Figure 4.5
Need to Spend Time Teaching Critical Thinking Skills at Young Age

Figure 4.6

Importance of Teaching Critical Thinking in Primary Grade Level

One kindergarten teacher explained, “They [students] should be able to take something that we previously learned about and then elaborate and use that knowledge to help them in an area, like [identifying] letters, letter sounds, and letter identification.” Additionally, one first grade teacher continued elaborating on her thoughts:

I think reasoning has a lot to do with ‘does the child understand why they are doing it...Does it make sense to you, and can you apply it to yourself?’ [For example] let us say
you invite friends to your birthday party and two of them called the day before and they aren't coming. Is that addition or subtraction? Right. It is subtraction. You are taking them [friends] off your list. It is how it applies to you?

Connecting what students are learning with real-life examples helps solidify their understanding of a skill. It helps one make the shift from an abstract idea to a concrete one.

One first grade teacher mentioned the importance of fostering "independence" in her students. She explained:

At this early age, I try to teach a sense of independence, and I think that has to do with problem-solving. [For example] knowing if I spill my water bottle, I know that is not a lesson, but what do you do? Do you watch the water pour out on the desk, or do you go and get something to clean it up? Then by doing those things, I think that it helps teach them [students] life skills that sometimes I think parents are so quick to do for them that they don't learn independence themselves.

Through analysis of the data, I found that teachers genuinely believe in the importance of teaching these "life skills" so that students understand the "why" behind what they are understanding and doing.

**Teachers’ Beliefs About Students’ Abilities to Develop Critical Thinking Skills**

Another theme that appeared throughout the data analysis focuses on what teachers believe about their students' abilities to develop these critical thinking skills. A teacher's influence, beliefs, and expectations of his/her students' abilities affect student achievement and performance. If teachers genuinely hold high expectations for their students and believe that they can develop these skills, they can successfully implement their instruction. When students are
viewed negatively by their teachers, such as having no ability to develop individual skills, they take on their beliefs.

**Only Some are Capable**

Of those who were surveyed, seven respondents (38.9%) agree that teachers believe only certain students can perform higher-order thinking skills, while nine of the respondents (50%) disagree with that idea (Figure 4.7).

![Figure 4.7](image)

*Teacher Beliefs on Student Performance on Higher Order Thinking*

If some teachers believe that only certain students can perform higher-order thinking skills, how will they learn those skills? If students struggle or fail to acquire them, teachers must hold high expectations that all students can develop and perform the skills.

During her interview, one kindergarten teacher mentioned the skills that only some of these young learners come to school with, while other students come to school need to learn more basic functioning skills:

*There are some [students] that come with so much knowledge before kindergarten, and then there are some that you’re teaching life things, manners, waiting, like holding the door for someone. I feel like you have to meet that before you can meet critical...*
thinking...I guess it could be critical thinking for someone who does not have those skills, like holding the door open. That door is going to shut right in front of that person. And what will happen? Maybe they will get hit by it.

When responding to the open-ended question on the survey, *What are the problems students face when you are trying to teach them thinking?*, one second grade teacher replied, "Students learn at different levels; some are readier than others to learn how to think."

Additionally, another second-grade teacher stated, "Some of the critical thinking is something that children are born with. Both of my children have been taught the same way, and one of them is a very critical thinker, and the other is not." Being ready to support the varied types of learners that teachers encounter is critical to students' access to the necessary skills essential for them to build upon their understanding.

To expand on whether students are ready to develop these skills, a reading interventionist stated, "Some students I feel are not ready to kind of think "out of the box," but through modeling, teachers can foster that way of thinking." Expanding on her thought, the reading interventionist continued:

I think we all need to be flexible with our teaching of it [critical thinking] and maybe a little more mindful of it. Yes, they are [students are] little, but they can get it if we are modeling. They can bring in some different perspectives that we might not have thought of or have not written.

In a separate interview, the math interventionist agreed:

I think every kid has their own avenue: some might want to draw, some might want to be able to tell you, some might want to be able to do it on technology, and some might want to do a different form of it - for some kids, I think we have to kind of find a balance.
Teachers must demonstrate flexibility when teaching their varied levels of learners, being flexible with how students show or express their knowledge, and the length of time spent to acquire these fundamental skills. Now more than ever, educators have to be flexible in all capacities: their thinking, their planning, their delivery of instruction, and ultimately in every way that they support their varied levels of learners.

**Needed Background Knowledge**

Of those responding to the survey, eight respondents (44.4%) agree, and three respondents (16.7%) strongly agree, resulting in 61.2% that believe students lack the needed background knowledge for improving critical thinking skills. In comparison, three respondents (16.7%) disagree, and one (5.6%) strongly disagrees that students lack background knowledge (Figure 4.8). Additionally, 77.8% of respondents agree or strongly agree that students lack experience improving critical thinking skills (Figure 4.9).

**Figure 4.8**

*Lack of Background Knowledge in Students*

**Figure 4.9**

*Lack of Student Experience with Critical Thinking*
During an open-ended response question on the survey, one reading interventionist stated, "Some students do not have a lot of background knowledge to draw from to answer a higher-level thinking question. Often they are hesitant to take a risk with how they would answer these types of questions." Additionally, one of the school's reading interventionists stated in the survey, "In the primary grades, there are large academic gaps between students who have a good foundation and those that are just beginning." An English Language (EL) teacher added, "At this level [of teaching in early grades], we spend so much time working on foundational skills. They [students] have to learn how to write. They have to learn how to spell it before they can write up." Through data analysis, the researcher found a consistent theme that students in primary grades did not have all of the necessary knowledge already needed to develop critical thinking skills. While previous experience or a basic understanding is required to build upon further, some children will only receive this knowledge through the instruction they receive in school.

One first grade teacher who was surveyed stated in an open-ended question, "I think we are in a time where kids like to take the easy way out of everything and want to be done quickly and know they are correct. It is hard for kids to take the time to slow down and truly think about things as a result." During an interview, a reading interventionist explained:
It is [critical thinking] almost like a subliminal thing. You see some of the kids going forward with a project or answering questions or are writing in their journal. Sometimes it surprises you who will do that [thinking]... I think for the younger kids, sometimes it is harder to get all those thoughts down. They know what they want to kind of say, but to get it out to put it on paper or to have a good explanation about something is a little more difficult for them.

Providing students with the opportunities to express their extended thoughts or transfer their ideas to written expression is integral for building upon learning skills.

**Parental Influence and Home Experiences**

According to one second grade teacher:

Parents do not want them [their children] to be critical thinkers either. I am thinking of parent-teacher conferences when with math, [parents] were like, why do they have to do it this way? Why did we have to reason it out? Why can't we just do it the way we always did it? Many of them [parents] will even show the kids that this is how you do it. This is how you get the answer. They [parents] take the whole critical thinking and the reasoning out of it and just show them how it works.

Another second-grade teacher stated:

I told parents that when we first started doing the new math, I was like, "Oh gosh, I do not like these strategies either because I was a paper person. When we started teaching, I was like, this is ridiculous. Why are we doing this? Now I am at Target, and I find myself breaking apart numbers quickly; I am doing it in my head.

Additionally, an EL teacher explained, “I keep going back to the home - are they [students] asked questions? Sometimes you [as the teachers] ask questions, and they are
are] like, why? How would I know that?” Without an established partnership with parents to reinforce skills within the home environment, students lose the chance to practice necessary skills beyond their time spent in the classrooms.

Furthermore, some students experience vast opportunities outside of school, and others are not as fortunate. One second grade teacher responded:

I think a lot of it has to do with their home life and their experiences with their families. If they have done more things like going to museums, going on vacations, doing this science thing, they can relate more and make more connections to what we are doing. Then [there are] some of the students who unfortunately have not had some of those experiences. [You can] use those kids to teach some of the other kids who do not necessarily get to go on to have those experiences.

Suppose parents do not encourage their children to problem solve or reason when working out a problem they encounter. In that case, they have missed opportunities for children to be practicing critical thinking skills.

**Conditions**

In the 4C’s framework, Wagner et al. (2006) define the *conditions* (Table 3) to be “the external architecture surrounding student learning, the tangible arrangement of time, space, and resources” (p. 101). In early primary grades, students come to school with a vast range of knowledge and abilities of what they already can do. It is essential to analyze what skills, knowledge, and professional development are needed to improve primary learners’ critical thinking skills in our district. Within Morgan Elementary School, the current instructional practices that are taking place in the primary grades should be examined.

**Current Instructional Practices**
Another theme that appeared throughout the data analysis identified current instructional practices that teachers utilize when teaching thinking skills. It is essential to consider what strategies teachers use throughout their instruction and what can target developing critical thinking skills while their students are learning.

When asked: *What are the current practices of primary school teachers when teaching critical thinking skills in their classrooms?*, of those that responded, ten respondents (55.6%) disagree, and one respondent (5.6%) strong disagree, for a total of 61.2%, of respondents with the notion that learning the content is more important than critical thinking skills, with almost 39% of the respondents as neither agreeing or disagreeing (Figure 4.10). The math interventionist responded, “I think we teach the content and hope that the students learn to think critically along the way.” If teachers focus on teaching the content without teaching the foundational skills needed to make sense of and apply what they have learned, we disservice our teachers.

**Figure 4.10**

*Importance of Learning Content vs. Critical Thinking Skills*
Of those surveyed, six teachers (33.3%) agree that the curriculum utilized throughout the district stresses only the acquisition of facts, ideas, and concepts rather than promotes critical thinking skills. For the remaining respondents, six teachers (33.3%) disagree with that idea, and six teachers (33.3%) neither agree nor disagree (Figure 4.11). One first-grade teacher commented:

Our school-wide (curriculum) that we use now is an excellent source of comprehension and critical thinking for your higher readers...It is a disservice to the children at lower levels because they do not even know why they are being asked something and cannot expand on what they do not know.

Although the current district-wide curriculum provides students access to all of the Common Core State Standards (CCSS) for instruction at their grade level, teachers use supplemental resources and strategies to reach all learners, whether it brings students up to the grade level or extending beyond.

Figure 4.11
Curriculum Stresses Acquisition of Facts, Ideas, and Concepts
When responding to the survey, seven individuals (38.9%) agree that teachers might feel uncomfortable with questions that have no obvious answer. In comparison, six individuals (33.3%) disagree, and one (5.6%) strongly disagrees with this idea (for a total of 38.9% of respondents) (Figure 4.12). Additionally, one first grade teacher surveyed stated, “Not all students like being put on the spot or being wrong. They feel as if they get the wrong answer, they will be made fun of or attention will be drawn to them.” The math interventionist reflected, "In kindergarten, it is more like choosing the correct answer. In second grade, they do a little bit more of "explain your answer," stated the math interventionist."
Teacher Discomfort of Student Exploration of Questions

Of those who responded to the survey, eight individuals (44.4%) agree, and three individuals (16.7%) strongly agree that students lack the needed background knowledge to improve critical thinking skills. In contrast, three respondents (16.7%) disagree, and one respondent (5.6%) strongly disagrees that students lack background knowledge (Figure 4.8). Additionally, 13 respondents (72.2%) agree, and one (5.6%) strongly agrees that students lack experience in improving critical thinking skills in school (Figure 4.9).
Lack of Background Knowledge in Students

According to the survey respondents, eight respondents (44.4%) agree, and five respondents (27.8%) strongly agree, resulting in 72.2%, that students prefer activities and assignments with simple questions and answers (Figure 4.13). Additionally, 88.9% of the teachers (11 respondents agree, and five respondents strongly agree) that students expect each question to have the right answer (Figure 4.14). If activities have simple closed-ended questions or only one solution, it is challenging to incorporate extended thinking or critical thinking during that activity.
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Figure 4.13

*Student Preference of Activities with Simple Questions and Answers*

![Chart showing student preferences for activities with simple questions and answers.]

Figure 4.14

*Student Expectations That Each Question Has a Correct Answer*

![Chart showing student expectations regarding whether each question has a right answer.]

One first grade teacher stated, "They (students) are very literal beings and need to know that there can be many different solutions to one problem." Another first-grade teacher responded, "If you encourage your students that all types of answers, whether right or wrong, are accepted at all times, this will never be a problem. A teacher's response to right or wrong answers is critical." Furthermore, during her interview reflection, one kindergarten teacher
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

explained, "The hope is that they [students] get to the point where you do not have to give them all the information and that they feel confident and independent to be able to do some of those things and be able to make it [their thinking and connections] bigger and better than what you had hoped for.” For an educator to demonstrate that taking a risk when doing something, like answering a question or solving a problem, whether the individual is correct or not, is essential. The researcher’s opinion is that it is more important to take a risk and get to a wrong answer than feel that only one right answer is viable.

One first grade teacher interviewed mentioned, "Putting them [students] in groups and at differently varied levels can be helpful because some of your higher kids can be leaders and teach the ones that may struggle with critical thinking. They are learning from their peers.” One second grade teacher explained:

Sometimes I feel when I am teaching, do I need to be teaching this whole group because I know that half of my class can do this without me even teaching this. Sometimes that gets me because I am like I am wasting their time.

That same second-grade teacher added, "I have some questions starters that we use so that they are [students are] thinking about what to ask from what they have been told...They are not going to come up with that on their own. They need a little bit of prodding and help."

The math interventionist conveyed:

[In instruction, it is essential to] ask many questions: Why do they look sad? Why do you think what happened? Did something happen before that? You are training them [students] already at such a young age to start questioning and thinking about what they are observing.

The math interventionist extended her thought by adding:
At this age, you are modeling a lot of those techniques with the kids to expose them to that in hopes that in third, fourth, and fifth [grades], they will be able to have some knowledge of how to be able to move forward with that [thinking / transferring of skills].

**Technology Integration to Promote Critical Thinking Skills: Pros and Cons**

According to the survey respondents, nine teachers (50%) agree, and one teacher (5.6%) strongly agrees, for a total of 55.6%, that integrating technology into their lessons can enhance critical thinking skills in students (Figure 4.15). Of those that responded to the survey, eight individuals (44.4%) feel confident in their ability to develop students' critical thinking skills by utilizing tech integration into their lessons. In comparison, six individuals (33.3%) lack confidence in their abilities (Figure 4.16).

**Figure 4.15**

*Technology Integration Can Enhance Critical Thinking Skills*

![Pie chart showing distribution of responses to survey question regarding technology integration and critical thinking skills enhancement.]

**Figure 4.16**

*Teacher Confidence in Ability to Develop Critical Thinking Skills in Students with Integration of Technology*
When reflecting during their interviews, technology integration to promote critical thinking skills became a walking point amongst the teachers, including positive and negative ones. According to one first grade teacher’s interview, “It [technology] enhances creativity, which can foster creative thinking skills.” In the math interventionist’s view:

You are giving them [students] a little bit more freedom to kind of show what they can do. Some kids will be a lot more creative and give you a much better product than some other kids who could articulate more.

One second grade teacher believes, “I agree that it [technology] gives creativity, but I also agree that it is stumping communication...You have to be able to communicate.” While integrating technology into lessons can bring about opportunities for creativity and critical thinking skills, students need to have the fundamental skills of communication and navigating the use of technology.

Conversely, some teachers thought the integration of technology would not enhance the critical thinking of their students. In her interview, the self-contained special education teacher stated, "I think it [technology] could limit [my students] because I love Google, but I feel like you get the answer immediately; you get what you are looking for... The answers are ‘right
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

there' sometimes for them, and then they do not go that extra mile to think about it."

Additionally, according to the reading interventionist, "You do not want them to depend on it solely. You want them to think for themselves even to make a mistake or have kind of a different view." According to one second grade teacher, "I do not think it [integration of technology] should be the only way because I think many critical thinking skills are excellent in discussion with the kids." With Morgan Elementary School being 1:1 for iPad to student ratio, technology is both seen as something that can assist students with their learning and acquisition of skills. However, it should not be the only way to demonstrate learned skills.

**Challenges to Teaching Critical Thinking: Limited Time, Resources, & Training**

Throughout the data analysis, most frequently, the themes were the challenges that teachers identify when teaching critical thinking, more specifically, limited time, limited resources, and little training. According to the math interventionist during her interview, “The challenge for teachers is not knowing how [to teach critical thinking skills], not having the right materials, and being able to find the time.” Identifying the perceived challenges when teaching critical thinking can allow teachers to solve problems or workaround or within those barriers.

**Limited Time**

When asked: *What factors do participating teachers perceive as the barriers to improving critical thinking skills in primary learners?*, eight of those surveyed (50%) agree that teachers do not provide sufficient time for critical thinking in class. Of the remaining respondents, five or 27.8%, disagree and claim that teachers offer adequate critical thinking time (Figure 4.17). According to the teacher respondents, 13 respondents (72.2%) agree, and two respondents (11.1%) strongly agree that teachers have difficulty finding the time to develop activities to effectively teach critical thinking skills in class (Figure 4.18). Of those that
responded, ten respondents (55.6%) agree, and one respondent (5.6%) strongly agrees that no time is allocated for critical thinking activities outside of school. In comparison, six respondents (33.3%) disagree with that idea (Figure 4.19). Not having enough time is a common idea within an instructional day because many areas must be covered/taught across several discipline areas to keep students at grade level (Figure 4.17).

**Figure 4.17**

*Insufficient Time Spent on Critical Thinking in Class*

![Pie chart showing survey responses regarding insufficient time for critical thinking in class.](image)

---

**Figure 4.18**

*Insufficient Time for Teachers to Develop Critical Thinking Activities*
Limited Time for Critical Thinking Outside of School

Limited Resources

Of those that responded to the online survey, seven teachers (38.9%) agree, and one (5.6%) strongly agrees that they do not have enough resources to develop their students' critical thinking skills. For the remaining respondents, six individuals (33.3%) neither agree nor disagree with there not being enough resources, and four individuals (22.2%) disagree that there are not enough resources (Figure 4.20). The researcher’s data analysis of the results found that teachers feel they do not have adequate resources to develop critical thinking skills.
Figure 4.20

Limited Resources for Teachers to Develop Critical Thinking Skills

Limited Training

When questioned about whether teachers need more training about how to teach critical thinking skills, 16 respondents (88.9%) agree, and two respondents (11.1%) strongly agree that more in-service professional development is needed for teachers (Figure 4.21). During her interview, one first grade teacher stated:

We are all critically thinking in language arts, which is why we sometimes struggle with teaching our lower-level readers because I do not think we have enough instruction or experience teaching phonics and all of the other necessary techniques for getting those sight words and foundational skill. I do not even think we have enough time.

More training on how to teach foundational skills like phonics must be provided to teachers to deliver this essential information to students.

Figure 4.21

Need for Teacher Professional Development for Implementation of Critical Thinking Skills
Lastly, one second grade teacher mentioned, "There is so much on a teacher's plate, adding 'one more thing' to do and think about is hard. At the primary level, we need to let it come naturally and concentrate on it more as they get older." Suppose teachers at Morgan Elementary School do not have the required resources, time to plan instructional practices that engage critical thinking or need more professional development to assist them. In that case, their students will not have access to building these essential skills of thinking.

**Competencies**

Within his 4C’s framework, Wagner et al. (2006) stated that *competencies* (Table 4) involve the skills and talents that influence student learning within an educational system (p. 99). Teacher efficacy, or confidence in their abilities, is significant and students depend on their teachers to develop the skills needed to become successful learners.

**Teachers’ Confidence in Self to Develop Critical Thinking Skills in their Students**

An additional theme that presented itself throughout the data analysis focuses on teachers' confidence in themselves when developing their students’ critical thinking skills. A teacher's prior experience and surrounding school culture can influence their confidence, whether positive or negative. Teachers who have a strong sense of self-efficacy can believe in themselves and support their students to be resilient when developing critical thinking skills. Therefore, teachers
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

must have the self-confidence to effectively teach students how to develop essential skills to be successful as a learner.

When asked: *What were the factors that influence the implementation of critical thinking instruction by primary school teachers in elementary schools?*, according to the survey respondents, seven of the teachers (38.9%) feel confident in their ability to develop their students' critical thinking skills, while seven respondents (38.9%) neither agree nor disagree, and four respondents (22.2%) do not feel confident in their ability to develop the skills in their students (Figure 4.22).

**Figure 4.22**

*Teacher Confidence in Ability to Develop Critical Thinking Skills in Students*

One kindergarten teacher mentioned, "In college, we talked a little bit about rigor and critical thinking as critical thinking was a 'buzzword.' But I never felt like anything that they talked about, or they gave us helped me bring that into the classroom." She continued to state:

My whole point of being a teacher is to help them. If I do not know what I am doing, I am not helping them. [Critical thinking is...] a skill that they are going to need their
whole life. If I do not even have a base to start at, which I feel like I do not, I am not leading them to success.”

On a similar note, one self-contained special education teacher reflected during her interview:

I think there are ways that I can challenge them [students] a little more in the critical thinking department. Honestly, I would not know where to start. I feel that that would be something that I would need more training from the district or like just professional development or something to help me better support my students and those higher levels for where we are at... I think back to college, and you know, I am sure we took a course on something like this or talked about in every class. However, it is different when you are in the role you are in.

When responding to her early years in teaching, a reading interventionist reminisced:

As a new teacher, I remember, oh my gosh, I am following this, this story, the questions, whatever descriptive curriculum almost. However, as you work with your kids more as you know you are teaching more, it is easier to work the higher-level thinking questions or feel more comfortable doing that with them.

Furthermore, a first-grade teacher reflected on her ability to teach this vital skill:

As I have gotten older, I feel like my ability to teach critical thinking skills has gotten better than being fresh out of school. I do not think I was taught how to be a teacher of critical thinking. I do not think they taught that to me. I think I was taught how to teach a skill or teach to a test. As we have branched away from Basil Readers, as we have branched away from math being rote memorization, I have had to reteach my teacher brain to be a critical thinker, and then I try to make it more applicable to the child as well.

The first-grade teacher continued:
Even though I still struggle with critical thinking, I think it is hard because we tend to give, I want to give the answer. I want them to be right, and I do not want students to be incorrect. However, being incorrect is okay because it is a learning lesson for all of us, not just the kid.

The researcher’s data analysis confirms that teacher confidence in themselves is essential, and students depend on their teachers to believe in themselves. Additionally, acknowledging that failure is a part of the learning process and being willing to take risks is needed. Students need to see teachers as vulnerable and ready to try things for the first time, even if it is not successful.

**Interpretation**

As a result of the data analysis from both the surveys and interviews, teachers unanimously recognized that it is essential for them, as educators, to develop their students’ critical thinking skills, especially in the primary grade level in which they teach. While teachers deemed these skills necessary, the underlying challenge is their belief that not all students can acquire and perform higher-order thinking skills. Additionally, low teacher efficacy contributes to the assumptions about students’ abilities in developing these thinking skills. Ultimately, teachers need to build confidence in developing these critical thinking skills in their students.

From the interviews, it emerged that teachers feel responsible for fostering independence in their students. Developing these critical thinking skills of asking essential questions, reasoning, and problem-solving helps them with their independence. The data analysis indicates that teachers believe in the importance of teaching these life skills to understand the "why" behind what they are learning. Simultaneously, teachers feel they do not have the necessary time to plan specific lessons for critical thinking, nor the training to adequately integrate teaching strategies when students might lack previous knowledge to build other skills. The ultimate belief
that students lack the required prerequisite skills and experience to develop critical thinking skills at this age recurred throughout the survey results and interviews. While recognizing the importance of developing these critical thinking skills in their students, teachers need to have self-efficacy, allowing them to access and obtain these skills.

The findings indicate that teachers utilize the district-wide curriculum and hope that critical thinking will occur while teaching the content required at their grade level. Additionally, the results indicate that teachers feel the need to develop activities and questions that allow students to use critical thinking skills. To support this, teachers identify different resources from the recognized curriculum that foster critical thinking.

The data analysis supports the idea that students, even at this young age, must be instructed to develop critical thinking skills needed for success later in life. Further steps would need to be taken to determine precisely how teachers teach the skills and make them applicable for their students to access them.

Judgments

Returning to this study’s primary research questions, participant responses and data gathered from interviews provide essential insight into some of the questions. The primary research question is:

● What teaching strategies do primary teachers use in their teaching of critical thinking?

Additional related questions to consider include:

● What are the current practices of primary school teachers when teaching critical thinking skills in their classrooms?

   ○ How do primary school teachers define critical thinking?
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

○ What do teachers believe about their students’ abilities to use critical thinking skills?

● What teaching strategies do primary teachers use most frequently to encourage students to think critically?

○ What were the factors that influence the implementation of critical thinking instruction by primary school teachers in elementary schools?

○ What factors do participating teachers perceive as the barriers to improving critical thinking skills in primary learners?

The study results identify that teachers believe critical thinking includes all of the following components: 1) the ability to problem solve, 2) the ability to ask and answer clarifying questions, and 3) form one's ideas based on what they are learning. Throughout the data analysis, there are mixed results about whether teachers believe that all students can genuinely acquire these skills. Teachers feel that some students lack the needed background knowledge and experience to develop or improve their critical thinking skills.

Teachers that were interviewed in this study feel the need to spend more time during instruction on building foundational skills (teaching how to spell before teaching how to write expressive thoughts) before teaching higher-level thinking skills. Teachers create more straightforward instructional practices for young students since they feel that their students prefer activities and assignments with simple, basic questions and answers. Each question has a right answer. Additionally, with 1:1 technology available for all students to utilize during instruction, teachers feel that while integrating technology into their lesson can enhance critical thinking skills, they cannot be confident in using it efficiently. While the district-wide curriculum is seen as a great source of instructional content and provides critical thinking opportunities for higher
readers, resources are seen as limited for the lower-level learners who cannot already think critically. If teachers had more time to dedicate to developing activities with specific strategies to teach these skills, more resources to utilize, and more in-service professional development on teaching critical thinking skills, teachers would feel more confident in implementing these skills within their instruction.

**Recommendations**

A positive finding in the research relates to the culture within the 4C’s framework. According to the teacher responses, they all believe in teaching critical thinking skills to young students and the need for time to implement these strategies in their instructional practices.

To support teachers in their efforts, the researcher recommends that teachers utilize various formative assessments when identifying students' prior background knowledge to determine the foundational information students have before teaching essential skills within the core content. Utilizing formative, diagnostic assessments (such as pre-tests/post-tests) can help teachers identify what information students already have to better guide their instruction regarding what background knowledge they will need to teach or focus on within their lessons. Assigning an “exit ticket” at the end of a lesson asks students to write down their idea of what they learned, which provides teachers with informal data of what students have learned. Additionally, providing students opportunities to analyze their student work and explain how they got to an answer informs the teacher of students can extend their thinking about something.

Suppose teachers understand what their students already know as a baseline for background knowledge. In that case, it gives teachers a starting point to plan for instruction that will more readily engage in the critical thinking process. Teachers can provide post-diagnostic assessments to determine if students acquired the skills based on their performance of them.
Teachers need to use critical thinking rubrics that focus on each specific element of asking questions, drawing conclusions, and forming opinions to determine if they demonstrate those skills at different proficiency levels.

It is necessary to provide teachers with the knowledge and understanding of Bloom’s Taxonomy and Webb’s Depth of Knowledge (DOK) when planning their lessons (Appendix H). Teachers could utilize specific DOK question stems (specifically Level 1 - Recall and Level 2 - Skills or Concepts) within their daily instruction from the first day of class to get students comfortable speaking and using to start a dialogue. With the teacher modeling how to utilize each of the four DOK levels, students will practice these steps when learning independently (Appendix C). During DOK Level 1 - Recall, students could be asked to “recall” facts or know who or what they learned about a particular concept. For DOK Level 2 - Skills or Concepts, students could be tasked with using information learned to solve multi-step problems. Students would take what they know and make connections to something else, such as comparing/contrasting two items. For DOK Level 3 - Strategic Thinking, teachers could offer students real-world scenarios to make a real and relevant concept. For example, asking students to reason if homework should be assigned daily would help them think strategically and use their reasoning skills when defending their answers. For DOK Level 4 - Extending Thinking, students could be asked to solve more complex problems, such as developing a solution of their own based on a problem. While levels 3 and 4 are much more challenging, students need to practice levels 1 and 2 to have the foundational knowledge, get comfortable speaking, and build upon their thinking. Bloom’s Taxonomy and Webb’s DOK must remain a focus at Morgan Elementary School staff and grade-level meetings so that teachers can share lessons that they feel encourage students to develop and build their critical thinking skills.
Teachers should spend time collaborating with their grade-level teams to create a band of strategies that can be used during ELA and Math to allow students to develop these skills. For teachers to create activities and tasks that ask students to critically think positively impacts their learning outcomes. It allows students to show their learning in broader ways rather than just one concrete way. If students are asked to think “outside of the box,” they are encouraged to become more independent and self-reliant thinkers.

**Summary**

Ultimately, the data analysis presented in this chapter found consistent themes that demonstrate the importance of students developing critical thinking skills in grades K-2. However, the teachers who participated in this mixed-methods study identified the challenges of limited time, limited resources, little training, and little confidence in themselves; these issues need to be addressed to implement practices that develop their students’ critical thinking skills. Primary grade students need to learn how to think critically and be provided with opportunities to acquire those skills early while learning to think independently. For those students to have access to the opportunity to build these skills, teachers at Morgan Elementary School must be fully supported with resources and training to help their learning. The present system of 4C's: context, culture, conditions, and competencies would need to change to implement critical thinking skills taught in grades K-2 successfully.
CHAPTER FIVE: ENVISIONING THE SUCCESS (“TO BE”)

By understanding the context, culture, conditions, and competencies currently at Morgan Elementary School, one can begin creating a "to be" vision related to critical thinking. To bring about this vision of desired change, Wagner et al. (2006) suggest that it is necessary to consider the intended results that this new system generates (p. 119). This change project’s desired outcome is: *Primary teachers are fully supported in having the time, resources, and knowledge to develop opportunities within their instructional practices to acquire critical thinking skills in grades K-2.* If instructional lessons are purposeful and well-planned, teachers can embed strategies to teach critical thinking in the primary grades K-2. This change can positively impact student achievement in students as they would have the tools to extend their thinking as they learn. As teachers gain more confidence in integrating these critical thinking skills into their daily lessons, they may have a higher sense of efficacy in their practice of developing students as thinkers. If teachers believe that all of their students can produce these thinking skills, teachers will embrace the opportunities to teach these skills. This is important because there is a direct correlation between teacher beliefs and expectations and the positive impact those beliefs and expectations can have on their students' academic performance. Additionally, students will learn to think critically, and all stakeholders will feel more successful in all of the contexts of the 4C's (Appendix G).
### Table 5

**Context – To Be**

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Utilizing a district-wide curriculum, lessons in core-content areas are differentiated to ensure learners use higher-order thinking skills.</td>
</tr>
<tr>
<td>• Teacher beliefs and expectations that all students can and will develop critical thinking skills.</td>
</tr>
<tr>
<td>• Teacher utilization of Bloom's Taxonomy / Webb's Depth of Knowledge (DOK).</td>
</tr>
<tr>
<td>• Implementation of instructional practices (using the workshop model) that include critical thinking skills embedded within activities.</td>
</tr>
<tr>
<td>• Time provided during instruction for students to practice developing critical thinking skills with teacher guidance/modeling first.</td>
</tr>
<tr>
<td>• Student acquisition of CT skills to generate questions to further understanding and expand upon their thinking.</td>
</tr>
<tr>
<td>• Evidence of student-led inquiry when working with peers.</td>
</tr>
</tbody>
</table>

### Table 6

**Culture – To Be**

<table>
<thead>
<tr>
<th>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High expectations that all students are capable of developing and building upon critical thinking skills.</td>
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<tr>
<td>• Partnership with families to encourage parental involvement of reinforcement of skills at home.</td>
</tr>
<tr>
<td>• Teacher beliefs and understanding of the importance of students acquiring critical thinking skills as an early learner.</td>
</tr>
<tr>
<td>• The necessity to spend time developing critical thinking skills within daily instruction.</td>
</tr>
<tr>
<td>• Flexibility in &quot;how&quot; teachers think, plan for instruction, deliver instruction, and support varied levels of learners.</td>
</tr>
<tr>
<td>• Staff will actively seek out best practices to support student acquisition of critical thinking skills.</td>
</tr>
<tr>
<td>• Critical thinking strategies are utilized across the curriculum to support student learning and growth in all reading types.</td>
</tr>
</tbody>
</table>
Table 7

**Conditions – To Be**

<table>
<thead>
<tr>
<th>Conditions</th>
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<tbody>
<tr>
<td>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</td>
</tr>
</tbody>
</table>

- Frequent professional development on strategies to effectively teach critical thinking skills.
- Allotted time embedded into grade-level meetings or Professional Learning (PL) days to meet all students’ needs to acquire essential skills and teachers to implement skills during instruction.
- Implementation of instructional practices (embedded with critical thinking skills) with fidelity.
- Demonstrating risk-taking and resilience in students.
- Purposeful use of technology (i.e., problem-solving and creative apps) promotes critical thinking skills.
- Students acquiring/utilizing foundational skills to enhance skills.
- Resources available to develop critical thinking skills.

Table 8

**Competencies – To Be**

<table>
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<tr>
<th>Competencies</th>
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<tbody>
<tr>
<td>Focused on: Supporting primary teachers in acquiring knowledge, abilities, and resources when developing critical thinking skills in students in grades K-2.</td>
</tr>
</tbody>
</table>

- Teacher efficacy/confidence in self to develop critical thinking skills in students.
- Enhanced teacher perception on how to implement critical thinking skills within their instruction.
- Teachers will receive in-depth training on the importance of teaching critical thinking skills early, with follow-up training over time.
- Consistent evidence of students' utilization of skills when transferring their learning to a new activity.
- Staff will share best practices on the Google Team Drive (free exchange of ideas amongst teachers).

**Context**

In Wagner et al.’s (2006) description of the 4C’s, context (Table 5) involves the social, historical, and economic elements within a system, and how the system operates and the skills
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2) required for students to be successful (p. 104). In this “To Be” scenario, teachers at Morgan Elementary School will have the resources to plan meaningful lessons that are differentiated to meet all learners’ needs to ensure they can develop and build upon higher-order thinking skills. These resources include training teachers to develop probing questions and problem-solving skills, rubrics to assess critical thinking at a young age, create activities requiring extended thought, and embed these skills into daily lessons. Teachers will not only know about Bloom’s Taxonomy and DOK, but they will utilize them in their daily tasks. Through the utilization of these resources, teachers will make time during their instruction for students to have the opportunities to ask probing questions that will then, in turn, extend their thoughts or make a connection to another topic/project/idea when working independently.

Access to available resources and ensuring time is spent on embedding critical thinking skills within the instructional practices of core content will be positive for both teacher and student stakeholders. There would be a positive impact on teacher efficacy, and therefore is a “significant predictor of productive teaching practices” (Goddard et al. 2004, p. 4). Learning critical thinking skills gives students the ability to identify reliable information and extend their thoughts to connect from something they learn to another idea. Therefore, teachers play an indispensable role when teaching students to assess what they see, read, and think. As students grow into 21st-century thinkers, they can use these skills in subsequent grades and eventually as productive members of society.

**Culture**

According to Wagner et al. (2006), the explanation of *culture* (Table 6), an element of the 4C’s change protocol, involves the shared beliefs and values within a system (p. 102). In this “To Be” scenario, all of the primary teachers at Morgan Elementary School will have a solid
understanding of students’ importance in acquiring critical thinking skills as early learners. Additionally, teachers will genuinely believe that critical thinking skills are essential at the grade level they teach and hold high expectations that all of their students can acquire these skills. Disbelief in students and their ability to think critically will diminish, and student performance expectations will increase.

To support this shift in the culture at Morgan Elementary School, teachers must be flexible in how they think about incorporating thinking into their daily lessons, how they plan for their instruction, how they deliver their instruction, and how they will support the varied levels of learners in their classroom. By shifting the culture, there will be an increase in meaningful student collaboration with their peers and engagement within instructional activities.

The teaching of critical thinking skills will impact the school culture significantly. Teachers will collaborate to actively seek out and share best practices to support student acquisition of essential thinking skills. Additionally, critical thinking strategies will be implemented across the curriculum and disciplines to support students' learning and reading types.

Lastly, teachers will ensure they are communicating the importance of practicing these skills at home with parents. One must practice a skill for it to become more accessible in the future. If teachers can assist students in developing these skills and making connections to real-world situations, then students will have a better chance of utilizing these skills of asking meaningful questions and problem solving on their own.

**Conditions**

Wagner et al. (2006) include the tangible elements of time, space, and resources in the definition of *conditions* (Table 7). Conditions also contain the external frameworks under which
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

a system operates surrounding student learning (p. 101). With the growth in teacher efficacy and student competency, improvements in the school culture and content will also improve conditions.

This professional development will not be a one-time-only training, as teachers will receive follow-up training over time. Teachers will receive practical hands-on strategies, especially utilizing Webb’s Depth of Knowledge question stems to use in their daily lessons. Teachers need to practice what they learn within their instructional, and then come back together to analyze and discuss its usefulness within the classrooms. Teachers will model how they use critical thinking skills within their instruction before asking students to utilize them independently. By taking risks and instilling resilience in students, the goal is for students to utilize their foundational skills to enhance critical thinking skills during learning.

Competencies

According to Wagner et al. (2006), competencies (Table 8) involve the abilities and capacities that impact student learning within an educational system (p. 99). This frequently includes teachers' instructional skills and social interaction skills with other colleagues within the system. In this "To Be" world, student and teacher competency would increase substantially. Additionally, teacher efficacy/confidence in oneself will increase as they develop these skills in their students. Teachers will receive in-depth professional development that focuses on excellent critical thinker's characteristics, probing questions to ask that extend and develop student thinking and implementing teaching strategies that provide essential thinking opportunities. Teachers will reflect on their development of critical thinking skills and how they use them in various aspects of their daily lives. Teachers will deep-dive within the district-wide curriculum to identify where they can build upon background knowledge within the disciplinary contents.
Using specific critical thinking questions aligned to DOK will offer students opportunities to engage more with their peers during peer discussion and collaboration. With every new skill or task, the teacher will have to spend significant time modeling the use of these skills and how they will extend an individual's thought and discussion. With the teacher "thinking aloud" and modeling for students her evolution of thought, students will become aware of thinking critically and using the specific question stems that require this extended thought process.

At Morgan Elementary School and throughout the district, teachers need to understand the instructional practices that will enhance student acquisition of critical thinking skills and the best strategies to transfer this ownership of the students’ skills. There will be consistent evidence of student utilization of critical thinking skills when transferring their learning to a new activity. Additionally, staff will share their best practices on the Good Team Drive (where there is a free exchange of ideas amongst teachers at Morgan Elementary School) to support their instruction.

Summary

For all of the changes to occur in the "To Be" scenario, all stakeholders must believe in the importance of young learners acquiring critical thinking skills in tandem as they learn to develop as a thinker. The suggestions provided under Wagner et al. (2006) 4C's framework of context, culture, condition, and competencies will allow the district to develop strategies to help teachers incorporate critical thinking skills throughout their daily instruction. This will address students' needs in FPSD#383, specifically Morgan Elementary, and it will ultimately prepare the students to be ready for the twenty-first century!

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CHAPTER SIX: STRATEGIES AND ACTIONS FOR CHANGE

To bridge the gap between the “As Is” and “To Be” scenarios, it is essential to establish strategies and actions that include teacher buy-in to the process. It is also essential to support their teaching of critical thinking skills in a meaningful manner, with the essential resources. Ultimately, teachers need to believe that their students are capable of developing critical thinking skills. Teachers need to take the time in their daily instructional practices to model and explicitly teach these skills.

Strategies and Actions

To shift the focus to developing critical thinking skills in primary grade students at Morgan Elementary School, teachers need to incorporate critical thinking strategies in daily instructional practices consistently. Both student and teacher stakeholders will benefit from this change since all individuals must have these skills to contribute to the twenty-first-century world.

The researcher strongly suggests that one possible way to move from the "As-Is" to the "To Be" is to embrace a process that will have a lasting effect on culture, climate, and academic progress. Improving critical thinking skills in primary learners is one process that can support students' academic performance. While Morgan Elementary School has not tried this approach, the researcher believes the following strategies and actions need to be implemented to support teachers in developing their students' critical thinking skills.

The first step in the strategy to achieve the "To Be" is to develop a team of teachers and building administrators who commit to developing a plan that would increase student achievement at the primary grades. Upon the team members committing to the vision, they will learn more about critical thinking by diving into the research and discussing critical thinking's importance.
Table 9

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
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</table>
| #1 - Build a team | • All primary buildings to invite individuals (teachers and admin) to be a part of a critical thinking team.  
• Review academic initiatives with the team to determine which could be aligned to improving thinking skills.  
• Provide the team with research as it relates to critical thinking.  
• Engage the team in a vision building process. |

**Measurement of Effectiveness:**
This step is significant if the committee members commit to the importance and necessity of building critical thinking skills in our young learners.

The next step in the process is to complete an analysis of the current curriculum related to teaching critical thinking skills. Each of the four primary schools in the district would review the curriculum aligned to the Common Core State Standards (CCSS) to identify opportunities for extending lessons/activities to teach critical thinking skills. The primary school teams will review research related to critical thinking to create a common "building critical thinking skills" framework for all four primary buildings to follow.
Identifying what is needed to implement in-depth professional development is the next step in the process (Table 11). This plan would include the district’s Department of Teaching and Learning to develop intentional and continuous professional development for all staff, both seasoned and new. To do so, school teams will attend workshops related to developing critical thinking in students and instructional practices to increase understanding.

District-wide professional development will include many critical thinking strategies to utilize within the classroom. By understanding what critical thinking is at the age group in which they teach, teachers will develop critical thinking characteristics. Teachers will learn the importance of teaching “active listening” and how to use “wait time” when engaging in discussions with their students. Professional development will also include diagnostic assessments, such as pre-tests and post-tests, and utilization of formative assessments, such as an “exit ticket” to capture what students learned from their interpretation of the information during the lesson. Teachers will learn how to utilize Bloom’s Taxonomy and Webb’s Depth of
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Knowledge (DOK) during instruction. The teacher will use the probing questions when in discussions with peers during think-pair-share and small group discussions. Additionally, understanding the importance of how and why students should analyze their work will enlist them to explain how they arrived at their answer.

This professional development will be delivered monthly during after school staff meetings and through district-wide Professional Learning days for teachers to collaborate with peers across grade levels and schools. Teams will utilize grade-level times to collaborate to develop lessons/instructional practices that integrate critical thinking throughout all disciplines. Additionally, resources needed to support teacher instruction will be provided to implement this professional development effectively.
Table 11

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
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<tbody>
<tr>
<td>#3 - In-depth professional</td>
<td>● Send school team members to workshops related to developing critical thinking in students and instructional practices to increase understanding.</td>
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<tr>
<td>development</td>
<td>● District’s Department of Teaching and Learning will identify intentional and continuous professional development opportunities focused on teachers embedding critical thinking into daily classroom practice:</td>
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<tr>
<td></td>
<td>○ Developing and characteristics of a critical thinker</td>
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<td></td>
<td>○ Teaching “active listening”</td>
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<tr>
<td></td>
<td>○ Use of “wait time” when engaging in discussion</td>
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<tr>
<td></td>
<td>○ Use diagnostic assessments (pre-tests/post-tests) to identify what knowledge students already acquire</td>
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<td>○ Develop “exit tickets” which informally assess what students learned from the focus of that daily lesson.</td>
</tr>
<tr>
<td></td>
<td>○ Utilization of Bloom’s Taxonomy and Webb’s Depth of Knowledge (DOK) during instruction through teacher modeling, think-pair-share, and small group discussions</td>
</tr>
<tr>
<td></td>
<td>■ Understand and incorporate DOK question stems throughout daily lessons to extend students’ thinking</td>
</tr>
<tr>
<td></td>
<td>● Level 1 - Recall of facts</td>
</tr>
<tr>
<td></td>
<td>● Level 2 - Skills or Concepts</td>
</tr>
<tr>
<td></td>
<td>● Level 3 - Strategic Thinking</td>
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<td></td>
<td>● Level 4 - Extended Thinking</td>
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<td></td>
<td>○ Student analysis of their work to explain “how” they got an answer</td>
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<td></td>
<td>● Provide time during monthly after school staff meetings and through district-wide Professional Learning days for teachers to collaborate with peers across grade levels and schools.</td>
</tr>
<tr>
<td></td>
<td>● Collaborate to develop lessons/instructional practices that integrate critical thinking throughout all disciplines</td>
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<td></td>
<td>● Purchase/create resources to support teacher instruction in each classroom.</td>
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<td></td>
<td>● Identify ways to monitor implementation for the effectiveness of professional development</td>
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</tbody>
</table>

**Measurement of Effectiveness:**
This step is significant if district staff and building administrators agree that critical thinking is a necessary part of instruction. The team will focus on gaining more knowledge and understanding of critical thinking.
Additionally, developing teachers as instructional leaders will be very important to this process (Table 12). Sending teachers to workshops related to developing critical thinking skills during daily instruction will allow teachers to come back and teach it to their teams within their buildings. As the team identifies the best strategies that apply to students at this age, it will be essential to create a critical thinking toolbox shared with others. This critical thinking toolbox will include ideas for integrating Webb’s DOK question stems throughout small group discussions, discussion techniques of turning and talking with a peer student during a lesson, and teaching students how to be active listeners. The toolbox will also include integrating technology within lessons by providing teachers with suggested apps that can extend students’ critical thinking skills based on their learning.

Table 12

<table>
<thead>
<tr>
<th>Strategy</th>
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</table>
| #4 - Develop teachers as instructional leaders | ● The building administrators and district’s Instructional Coaches will do weekly classroom walkthroughs to ensure critical thinking strategies are implemented within instruction with fidelity  
● Train teachers to effectively utilize data to improve teaching and instruction in the area of reading  
● Create a Critical Thinking Toolbox of strategies to be shared with all teachers  
● Encourage sharing best practices on Google Drive (a program that allows inter-school/district sharing.)  
● Incorporate technology  
● Encourage the gradual release of responsibility to the students  
● Perform weekly fidelity walkthroughs  
● Hold weekly Professional Learning opportunities and Lunch & Learn |

**Measurement of Effectiveness:**
This step is effective if all individuals are committed to the vision of needing to increase critical thinking skills through instructional practices at the primary grades.
The final stages in this process are developing the plan (Table 13) and communicating it (Table 14). It will be integral that a standard message is shared with others about how critical thinking will increase academic achievement. Communication will occur via the district website, social media platforms, school staff meetings, parent meetings, and school board meetings. The team will continue to meet quarterly to discuss the plan’s implementation and communicate any amendments to the stakeholders.

Table 13

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>#5 - Develop the plan</td>
<td>• Develop expectations for critical thinking for all staff - introduce at the beginning of year institute days.</td>
</tr>
<tr>
<td></td>
<td>• Provide specific professional development that focuses on embedding critical thinking strategies in daily instruction appropriate to each grade level, K-2. (Refer to Table 11 above.)</td>
</tr>
<tr>
<td></td>
<td>• Ensure that professional development is continuously implemented at each building through monthly staff meetings and district-wide curricular content teacher committees</td>
</tr>
<tr>
<td></td>
<td>• Develop academic goals to be met annually that will measure the effectiveness of the professional development plan.</td>
</tr>
<tr>
<td></td>
<td>• Monitor the implementation of the professional development plan.</td>
</tr>
<tr>
<td></td>
<td>• Create a standard message that will be shared with others about how critical thinking will increase academic achievement.</td>
</tr>
</tbody>
</table>

**Measurement of Effectiveness:**
This step is effective if the team collaborates to develop a plan that will start the process of critical thinking.
Table 14

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6 - Communicate the plan</td>
<td>● Meet with the team repeatedly to discuss critical thinking and the plan for its implementation</td>
</tr>
<tr>
<td></td>
<td>● Communication to occur via the district website, social media platforms, school staff meetings, parent meetings, and school board meetings.</td>
</tr>
</tbody>
</table>

**Measurement of Effectiveness:**
Use a survey to determine the effectiveness of this step.

**Summary**

To focus on developing critical thinkers at Morgan Elementary School while students are learning to think as young learners, all teachers must understand the importance of critical thinking and believe that students can develop these skills. While teachers acknowledge the importance of teaching these skills to all students, the data suggest that critical thinking is not effectively being taught. Morgan Elementary School can be intentional in planning and implementing these critical thinking skills for their students.
CHAPTER SEVEN: IMPLICATIONS AND POLICY RECOMMENDATIONS

Introduction

When thinking about incorporating critical thinking skills into instruction in primary grades, specifically K-2nd grade, teachers need to believe they can develop these necessary skills in their young learners. By identifying essential strategies in teaching critical thinking skills, students learn to think by making connections from the concrete to the abstract. This enables the learner to make meaning and synthesize information. This is one of the most challenging teaching tasks with primary learners.

Teachers often do not feel that they have the necessary knowledge, time to develop instructional activities, or receive adequate professional development training to provide instruction that will allow students to develop these skills. Therefore, teachers at the primary school level need to believe and hold high expectations that students can learn to think or acquire higher-order thinking at this young age as a learner. To support this shift in mindset, there needs to be time allotted, resources available, and accurate professional development provided to teachers for preparation to teach these critical thinking skills to students.

Policy Statement

The researcher recommends that the district adopt a new instructional policy to provide introductory and continuous professional development to both beginning and experienced primary teachers annually, explicitly focusing on student acquisition of critical thinking skills. The desired outcome would be that primary teachers would consistently incorporate strategies to develop critical thinking skills while teaching young learners. It will be the school district's obligation to ensure teachers are sufficiently trained in teaching critical thinking that resonates with the students and is easily recognizable in the teacher's day-to-day teaching. Teachers will
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

utilize Bloom's Taxonomy and Webb's Depth of Knowledge (DOK) questioning methods during instruction.

Some current practices in developing critical skills in primary students include the district's mentor program for new teachers, Beginning Educators Assimilation & Mentoring System (BEAMS). During a teacher's first two years of teaching at the district level, new staff members will be offered many opportunities to participate in ongoing professional development workshops that incorporate critical thinking skills into their instruction.

At the building level, there will be an increased professional development focus on how Webb's Depth of Knowledge questioning can be incorporated into the district's current English Language Arts curriculum. Teachers will collaborate through grade-level and staff meetings to identify how they can utilize the four levels of DOK questions within their instruction to allow students to create more in-depth questions that will build upon their understanding of their learning. As building administrators continue to focus on small group instruction within the classroom, additional emphasis must be placed on implementing critical thinking skills (Webb's DOK) during small group instruction. Teachers will be provided tutorials on how to implement the gradual release method of responsibility ("I Do" by the teacher modeling instruction to the students, "We Do" by the teacher and students practicing it together as a class, and "You Do" by the students practicing it with partners or trios). This will allow the teacher to support learning in small groups of students while others practice their skills.

Additionally, as district-wide curriculum teams come together to identify consistency in teaching content and skills across grades in different buildings, the district's curriculum department will provide resources and time for teacher teams to collaborate and plan. These teachers will then go back to their school and "teach-back" their learning to their building teams
to incorporate critical thinking skills into their instruction. Having vertical alignment opportunities allows teachers to reinforce the importance of integrating these skills into their daily lessons. They can see how the next subsequent grade level builds upon the questioning and reasoning skills needed.

This new instructional policy that provides introductory and continuous professional development to both beginning and experienced primary teachers annually, explicitly focusing on student acquisition and development of critical thinking skills, will increase primary students' critical thinking skills. This policy ultimately focuses on supporting teachers with gaining knowledge, using specific time for collaboration with peers, and receiving consistent professional development to provide instruction that will allow students to develop critical thinking skills.

**Analysis of Needs**

This policy is carefully reviewed from distinct disciplinary areas to ensure any implications and choices resulting from this policy are considered. The researcher will analyze these needs through the following frames: educational, economic, social, political, and moral, and ethical.

**Educational Analysis**

Critical thinking is critical in life. Students with critical thinking skills become self-directed learners. Rather than merely relying on teachers and class time to learn rote skills, students need to think "outside of the box" and expand upon their thinking. Tony Wagner (2008) states:

The proportion of the U.S. students who graduate from high school today—about 70 percent—is smaller than that of their counterparts in most other developed countries, and
fewer than half of this group graduate with the skills needed for college and jobs that pay more than minimum wage.

In Wagner’s Global Achievement Gap (2008), Wagner describes it simply, “Schools haven’t changed; the world has… and our schools are obsolete” (2008, p. xxi). Schools “. . . were never designed to teach all students how to think” (Wagner, 2008, p.xiii). The benefits of acquiring and developing critical thinking skills, explicitly asking probing questions, and making meaning of what one is learning, are necessary to teach in all grades, including grades K-2. Using foundational skills to develop these skills will make students more successful in subsequent grades.

**Economic Analysis**

Students need to be prepared to be a contributing participant in the global economy. Kay and Greenhill, in *The Leader’s Guide to 21st Century Education* (2013), state, "Workforce skills and demands have changed dramatically in the past 40 years. Our system of education was built for an economy that no longer exists" (p. 3). The authors suggest that education systems need a model that "will prepare people for analytical and interactive work" (Kay & Greenhill, 2013, p. 4). Kay and Greenhill argue, "The workforce of the 1950s did not require critical thinking, communication, collaboration, and creativity skills," which are now a necessity and the "ticket up the economic ladder" (2013, p. 5). While investing in professional development training at the start of the year and supporting teachers annually will cost the district, it is an essential economic investment since the students will be leaving school having developed these crucial critical thinking skills. Since the economy's increasing demands continue to change, the ability to problem-solve, analyze information, and have good thinking skills will positively impact the 21st-century workplace.
Social Analysis

One aspect of the policy advocates that the district provides introductory and continuous professional development to the beginning and experienced primary teachers annually. Teachers will intentionally learn ways to support their students’ abilities to think critically, acquire reasoning skills, and be creative. Schools can no longer be institutions that teach memorization and have students practice rote skills; primary students need to be offered the opportunity to develop critical thinking skills. The earlier students are motivated and engaged with the learning process, the earlier they can cultivate a love for learning.

Political Analysis

Changes in school policies can be challenging for some stakeholders to accept and are, at times, met with resistance. Even though teachers at Morgan Elementary School believe critical thinking skills are essential for the primary grades, the skills are not present within their daily instructional practices. Many new initiatives are introduced within the school district and are met with involvement from the teacher’s union opposing the changes proposed.

Moral and Ethical Analysis

Mandates are often imposed on schools that do not directly benefit the students. This sometimes requires additional staffing or procedures that had not been budgeted or allocated for the school-year plan. Incorporating critical thinking skills into instruction in primary grades, specifically kindergarten through 2nd grade, will require significant professional development on the part of the teachers. The costs that the district will incur to train teachers is a moral dilemma within this policy advocacy. Teachers already have a tremendous amount to accomplish within the time constraints of their school day and year. Teaching critical thinking skills is necessary and adds more weight to what teachers need to achieve. However, educators are morally and
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

ethically bound to ensure that our young learners develop essential and critical thinking skills to succeed later in life.

**Implications for Staff and Community Relationships**

Given the instructional policy for placing a high importance on integrating critical thinking skills throughout the curriculum and providing a focus for teachers to collaborate when preparing their instruction, some implications arise for staff and community relationships. Regarding staff relationships, there is an opportunity for collaboration among staff members to emphasize and teach essential critical thinking skills. There needs to be consistency with professional development and reinforcement at the building level to teach these skills. All stakeholders must hold high expectations for all student learners, despite their varying and diverse backgrounds. While students come from diverse backgrounds, there must be high expectations for all our learners. The belief that all can learn these skills is essential.

Additionally, a significant emphasis needs to be placed on creating a partnership between home and school relationships to help young learners build their problem-solving and critical thinking skills. Parents, guardians, and families at home need to know how to extend their children's thinking skills at school out into their home life beyond the school day. This takes collaboration and communication so that students can build upon critical thinking skills in multiple environments.

**Summary**

In conclusion, primary students need to learn how to think critically and be provided with opportunities to acquire critical thinking skills at an early age while learning to think independently. For young students to have the opportunity to build these skills, both novice and experienced primary teachers at Morgan Elementary School will receive the professional
development and resources to support critical thinking implementation within their instruction. Teachers at Morgan Elementary School have long identified the importance of teaching critical thinking in the primary grades, and adopting this policy would embrace that desire!
CHAPTER EIGHT: CONCLUSION

Introduction

To be a productive and contributing member of society, critical thinking is a skill that will benefit an individual in many ways. Explicitly developing critical thinking skills, while students are initially developing as thinkers in primary grades, can improve their academic performance and participation in class instruction. Furthermore, the acquisition of critical thinking strategies can prepare students for success as learners in subsequent years and help them develop the skills necessary to compete in the ever-changing global environment.

Morgan Elementary School, a K-2 school in Fulton Park School District #383 (FPSD#383), located 30 miles southwest of Chicago, IL, has struggled to ensure students develop critical thinking skills to be successful as they transition to subsequent grade levels. To better understand how critical thinking is taught and what materials are used to teach it, the Morgan Elementary School staff had an opportunity to examine their perceptions, knowledge, and abilities about developing critical thinking skills in grades K-2. This was done through a survey and semi-structured interviews. The ultimate purpose of the study was to answer the following key questions:

1. What teaching strategies do primary teachers use in their teaching of critical thinking?
2. How do primary school teachers define critical thinking?
3. What do teachers believe about their students’ abilities to use critical thinking skills?
4. What are the current practices of primary school teachers when teaching critical thinking skills in their classrooms?
5. What were the factors that influence the implementation of critical thinking instruction by primary school teachers in elementary schools?
6. What factors do participating teachers perceive as the barriers to improving critical thinking skills in primary learners?

7. What teaching strategies do primary teachers use most frequently to encourage students to think critically?

**Discussion**

The purpose of this study was to determine the extent to which educators at Morgan Elementary School teach critical thinking in the primary grades of K-2. An analysis of the data confirmed that while teachers define critical thinking skills as essential and should be taught, they are not necessarily confident in implementing the strategies to develop these skills during instruction. Data analysis revealed that teachers feel they do not have the necessary time, resources, or training to intentionally plan for teaching critical thinking skills during their daily lessons. Furthermore, teachers acknowledged their concern for students who lack the needed background knowledge and foundational skills to develop these skills at this age. While each teacher interviewed concluded that developing critical thinking skills were essential for their students, they did not teach these skills consistently or with fidelity.

Data shows that teachers might not have all of the tools or knowledge to teach critical thinking skills as their young learners learn to "think" from the abstract to concrete at a young age. It is vital that teachers feel confident in their abilities to teach their students these essential thinking skills. These areas must be addressed before critical thinking can be implemented with integrity at Morgan Elementary School.

To address these areas of opportunity, a series of strategies and actions to address the development of critical thinking skills in young learners have been proposed. This plan has five parts: 1) complete analysis of the current curriculum, 2) in-depth professional development for
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

beginning and experienced primary teachers, 3) develop teachers as instructional leaders, 4) utilize data-based decision making, and 5) develop and communicate the plan. To ensure these strategies are effective, they must be evaluated regularly, and building and district leadership must maintain a continued focus on them.

Leadership Lessons

Having completed this research while I became a principal for the first time allowed me to reflect on the type of leader I am and the type of instructional leader I want to become. At the same time, I also evolved as a learner throughout this process.

Learning as a Leader

Before becoming a school administrator, as a teacher, all I had wanted was unconditional guidance and coaching support from my administration to learn and do my best when teaching the students I serve. When I felt that support was lacking, I pledged to become an administrator who would serve my students and teachers to go through all depths to determine how I could help them within my abilities. Reflecting on this research study, specifically through the analysis of the results, has guided me to a few key lessons as a building leader:

- Implementation of any change starts from the top down
- Staff needs to feel fully and unconditionally supported
- Need to staying “student-centered”

I know my staff works tireless hours to support their students’ needs and abilities to grow as learners. Teaching is a rewarding but challenging job, and introducing or undergoing any type of “change” in any job is difficult for anyone. Therefore, implementing any change or new initiative needs to start from the top down, as modeled and supported by school and district administration. I learned that it is my responsibility to believe in any “change” that I am asking
for my teacher’s buy-in. The notion that critical thinking skills are essential for all young learners starts with me—believing and modeling how to develop my skills for myself and others.

Staff needs to feel fully and unconditionally supported when committing to a new initiative. As a leader, when introducing something new that I want teachers to make an essential part of their instruction, I learned that teachers need to understand and obtain practical strategies to embed critical thinking skills within their existing instruction. Teachers need to feel supported by providing time and resources or ideas to use immediately to begin developing these skills.

The importance of staying “student-centered” needs to remain at the forefront of all decisions being made. As a leader, I learned that making decisions can be challenging because it falls on me regardless of the result. Before we can teach students anything, all educators must hold high expectations that all students can learn. Teachers need to honestly believe that their students can acquire the necessary skills being taught. As long as my choices remain focused on students at the center of all decisions, including how I can support and help teachers stay student-centered, I will always lead with integrity.

**Learning as a Learner**

My understanding of the importance and necessity of teaching these essential skills to all students evolved during my research process. When I first settled on this research topic, I was startled by how necessary all 21st-century skills are for success in our current world. Considered the first of Wagner’s (2008) Seven Survival Skills, he argues that being able to critically think, along with the other essential skills, “are neither taught nor tested even in our best school systems” (p.14). Gallagher-Mackay & Steinhauer (2017) argue, “Whatever you call them—twenty-first-century skills, employability skills or higher-order skills—the need to develop them among our students will have profound implications for the schools of the future” (p.17).
Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

Exploring this research encouraged me to identify what can be done or taught to students at a young age to build or develop these skills for success later in life.

I learned that students come to school with vastly different backgrounds and environmental factors that affect them. While some students appear ready for learning and have the necessary skills to build upon, other students need to be taught foundational life skills before they can have the baseline to build upon. As a learner myself, I did not fully understand what critical thinking meant, as it seemed to be a buzzword that was used without having a real understanding of how or why to develop these skills. My knowledge and understanding have evolved through this research process. Ultimately, anything worth teaching takes time, commitment, and the understanding that there will be many opportunities to fail along the way.

Summary

Students have become good at the "game of school" in that they listen to teachers’ lectures, produce what the teacher expects of them, and appear to learn everything that is deemed necessary. However, if we expect students to be able to think outside of the box, make connections from one thing that they are learning to another, and form their own opinion, educators must provide students with opportunities to learn "how to think" not just "what to think." Educators need to be taught the importance of how to develop critical thinking skills in their learners during their teacher preparation programs. Additionally, once teachers are hired within a district and trusted with educating an entire class of students, they need to implement strategies that develop these crucial skills.

To date, critical thinking is believed to be one of the most regularly discussed skills in education since it is central to being able to reason, make decisions, create and defend arguments and solve problems (Ventura, Lai, & Dicerbo, 2017, p. 5). Most educators would acknowledge
that learning to think critically is one of the most covetable goals as students begin their educational careers (Abrami et al., 2008, p. 1102). However, there is minimal evidence that educators are consistently developing their students as critical thinkers in the primary grades when they are learning to think for themselves. It is up to us as educators to provide students with the essential 21st-century skills to be successful and ready for the global world.
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Appendix A: Bloom’s Revised Taxonomy

Bloom’s Revised Taxonomy - Lorin Anderson, a former student of Bloom, and David Krathwohl, one of Bloom’s partners, revisited the cognitive domain in the mid-nineties and made some changes: (1) changing the names in the six categories from noun to verb forms, (2) rearranging them as shown in the chart below, (3) creative processes and levels of knowledge matrix

<table>
<thead>
<tr>
<th>Original Domain</th>
<th>New Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Evaluation</td>
<td>• Creating</td>
</tr>
<tr>
<td>• Synthesis</td>
<td>• Evaluating</td>
</tr>
<tr>
<td>• Analysis</td>
<td>• Analyzing</td>
</tr>
<tr>
<td>• Application</td>
<td>• Applying</td>
</tr>
<tr>
<td>• Comprehension</td>
<td>• Understanding</td>
</tr>
<tr>
<td>• Knowledge</td>
<td>• Remembering</td>
</tr>
</tbody>
</table>
Appendix B: Webb’s Depth of Knowledge Snapshot

LEVEL 1
Recall
- Basic recall of information, such as a fact, definition, term, or procedure
- Requires students to follow a formula or recipe

Keywords:
- Identify
- Recall
- Use
- Measure

LEVEL 2
Skills and concepts
- Complete multiple steps in order to find a solution
- Requires students to make informed decisions about problem-solving and procedures

Keywords:
- Classify
- Organize
- Estimate
- Collect & display data

LEVEL 3
Strategic thinking
- Reasoning, planning, using evidence, or a higher level of thinking
- Requires students to draw conclusions from observations

Keywords:
- Justify
- Explain
- Draw conclusions

LEVEL 4
Extended thinking
- Complex reasoning, developing, or thinking over a period of time
- Requires students to design and conduct an experiment

Keywords:
- Relate
- Make connections
Appendix C: Webb’s Depth of Knowledge Question Stems

<table>
<thead>
<tr>
<th>DOK Question Stems</th>
<th>DOK 2 – Skill/Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOK 1 - Recall</strong></td>
<td><strong>DOK 2 – Skill/Concept</strong></td>
</tr>
<tr>
<td>Can you recall____?</td>
<td>Can you explain how ____ affected ____?</td>
</tr>
<tr>
<td>When did ____ happen?</td>
<td>How would you apply what you learned to develop ____?</td>
</tr>
<tr>
<td>Who was ____?</td>
<td>How would you compare ____?</td>
</tr>
<tr>
<td>How can you recognize ____?</td>
<td>Contrast ____?</td>
</tr>
<tr>
<td>What is ____?</td>
<td>How would you classify ____?</td>
</tr>
<tr>
<td>How can you find the meaning of ____?</td>
<td>How are ____ alike? Different?</td>
</tr>
<tr>
<td>Can you recall ____?</td>
<td>How would you classify the type of ____?</td>
</tr>
<tr>
<td>Can you select ____?</td>
<td>What can you say about ____?</td>
</tr>
<tr>
<td>How would you write ____?</td>
<td>How would you summarize ____?</td>
</tr>
<tr>
<td>What might you include on a list about ____?</td>
<td>How would you summarize ____?</td>
</tr>
<tr>
<td>Who discovered ____?</td>
<td>What steps are needed to edit ____?</td>
</tr>
<tr>
<td>What is the formula for ____?</td>
<td>When would you use an outline to ____?</td>
</tr>
<tr>
<td>Can you identify ____?</td>
<td>How would you estimate ____?</td>
</tr>
<tr>
<td>How would you describe ____?</td>
<td>How could you organize ____?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOK 3 – Strategic Thinking</th>
<th>DOK 4 – Extended Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>How is ____ related to ____?</td>
<td>Write a thesis, drawing conclusions from multiple sources.</td>
</tr>
<tr>
<td>What conclusions can you draw ____?</td>
<td>Design and conduct an experiment. Gather information to develop alternative explanations for the results of an experiment.</td>
</tr>
<tr>
<td>How would you adapt to create a different ____?</td>
<td>Write a research paper on a topic.</td>
</tr>
<tr>
<td>How would you test ____?</td>
<td>Apply information from one text to another text to develop a persuasive argument.</td>
</tr>
<tr>
<td>Can you predict the outcome if ____?</td>
<td>What information can you gather to support your idea about ____?</td>
</tr>
<tr>
<td>What is the best answer? Why?</td>
<td>DOK 4 would most likely be the writing of a research paper or applying information from one text to another text to develop a persuasive argument.</td>
</tr>
<tr>
<td>What conclusion can be drawn from these three texts?</td>
<td>DOK 4 requires time for extended thinking.</td>
</tr>
<tr>
<td>What facts would you select to support ____?</td>
<td>Support your rationale.</td>
</tr>
<tr>
<td>Can you elaborate on the reason ____?</td>
<td>How would you describe the sequence of ____?</td>
</tr>
<tr>
<td>What would happen if ____?</td>
<td>What would you use to classify ____?</td>
</tr>
<tr>
<td>Can you formulate a theory for ____?</td>
<td>What do you notice about ____?</td>
</tr>
<tr>
<td>How would you test ____?</td>
<td></td>
</tr>
<tr>
<td>Can you elaborate on the reason ____?</td>
<td></td>
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</tbody>
</table>

From Depth of Knowledge – Descriptors, Examples and Question Stems for Increasing Depth of Knowledge in the Classroom Developed by Dr. Norman Webb and Flip Chart developed by Myra Collins
Appendix D: Teacher Survey

Critical Thinking Survey

The study is called Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades. This study will help us learn teachers’ perceptions, knowledge, and abilities about the development of critical thinking skills in grades K-2. In this study, you will be asked to complete survey questions. Some questions will be about you. Some questions will be about your thoughts. Some will be about how you feel and what you do. Participation in this survey should take approximately 15 minutes. However, you can stop answering the questions at any time. You can stop taking the survey at any time you wish. Participating in this survey is voluntary and is your choice.

I have read and signed the informed consent document. *

Choose

Please identify your instructional role.

How long have you been teaching?

☐ 1-3 years
☐ 4-6 years
☐ 7-10 years
☐ 11-15 years
☐ 16+ years
Grade Level of Teaching

Choose

1. I think critical thinking includes...... (mark all that apply)

☐ Ability to problem solve

☐ Ability to ask and answer clarifying questions

☐ Ability to form one's own ideas based on the information one has learned

☐ Other: 

Below are the statements which refer to the significance of improving student critical thinking skills and the barriers to it. Please read and respond to each statement on the five-point Likert scale (1-5, with 5 being the highest) by indicating the strength of your agreement or disagreement with each one.

2. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Learning the content is more important than critical thinking skills.

☐ 5 - Strongly Agree

☐ 4 - Agree

☐ 3 - Neither Agree no Disagree

☐ 2 - Disagree

☐ 1 - Strongly Disagree
3. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: There is no need to spend time on critical thinking skills at this young age since the skills they are learned naturally.

- [ ] 5 - Strongly Agree
- [ ] 4 - Agree
- [ ] 3 - Neither Agree nor Disagree
- [ ] 2 - Disagree
- [ ] 1 - Strongly Disagree

4. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers do not provide sufficient time for critical thinking in class.

- [ ] 5 - Strongly Agree
- [ ] 4 - Agree
- [ ] 3 - Neither Agree nor Disagree
- [ ] 2 - Disagree
- [ ] 1 - Strongly Disagree
5. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers believe only certain students can perform higher order thinking.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree no Disagree
- 2 - Disagree
- 1 - Strongly Disagree

6. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers feel uncomfortable with questions that have no obvious answer.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree no Disagree
- 2 - Disagree
- 1 - Strongly Disagree
7. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers do not have enough resources to develop my students’ critical thinking skills.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree

8. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers struggle to find the time to develop activities to effectively teach critical thinking skills.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree
9. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Teachers need more training about how to teach critical thinking skills.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree

10. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Students expect that each question has a right answer.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree
11. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Students prefer activities and assignments with simple questions and answers.

☐  5 - Strongly Agree
☐  4 - Agree
☐  3 - Neither Agree no Disagree
☐  2 - Disagree
☐  1 - Strongly Disagree

12. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Students lack needed background knowledge for improving critical thinking skills.

☐  5 - Strongly Agree
☐  4 - Agree
☐  3 - Neither Agree no Disagree
☐  2 - Disagree
☐  1 - Strongly Disagree
13. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Students lack experience in improving critical thinking skills in school.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree

14. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Curriculum stresses only the acquisition of facts, ideas, and concepts.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree
15. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: No time is allocated for critical thinking activities outside of school.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree

16. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: It is important to me that I develop my students’ critical thinking skills.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree nor Disagree
- 2 - Disagree
- 1 - Strongly Disagree
17. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: I feel confident in my ability to develop my students' critical thinking skills.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree no Disagree
- 2 - Disagree
- 1 - Strongly Disagree

18. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Critical thinking is especially important in the grade level that I teach.

- 5 - Strongly Agree
- 4 - Agree
- 3 - Neither Agree no Disagree
- 2 - Disagree
- 1 - Strongly Disagree
19. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: Integrating technology into my lessons can help enhance critical thinking skills in students.

   - 5 - Strongly Agree
   - 4 - Agree
   - 3 - Neither Agree nor Disagree
   - 2 - Disagree
   - 1 - Strongly Disagree

20. On a scale of 1-5, with 5 being the highest, to what extent do you agree with the following statement: I feel confident in my ability to develop my students' critical thinking skills by integrating technology into my lessons.

   - 5 - Strongly Agree
   - 4 - Agree
   - 3 - Neither Agree nor Disagree
   - 2 - Disagree
   - 1 - Strongly Disagree

21. What digital activities have you utilized in instruction to promote critical thinking?

22. If support for teaching critical thinking was available, what would be the most convenient way to receive support for this?

23. Do you think all children benefit from a concentration on teaching thinking?
24. What are the problems faced by students when you are trying to teach them thinking?

25. Is there anything else you’d like to tell me about the challenges of teaching critical thinking?
Appendix E: Semi-Structured Teacher Interview (Critical Thinking)

Thank you for agreeing to this interview. The purpose is to look into your views of critical thinking. More specifically, the purpose is to determine the extent to which the tools and language of critical thinking have come to play an important role in the way you think about teaching and learning, and the way you structure your instructional practices.

Teacher Interview Questions

1. Tell me a little about yourself and what you have done prior to coming to Fulton Park School District*.
2. What is your current position in Fulton Park School District*?
3. From your perspective, how would you define critical thinking?
4. What role, in your opinion, does critical thinking play in your classroom?
5. Do you think that critical thinking happens in your classroom when you are teaching your students? If so, how do you know?
6. How do you think you could bring about critical thinking among students? Specifically, what are some things you do or could do to get your students to think critically?
7. What are the problems faced by students when you are trying to teach them critical thinking? If so, identify them.
8. Do you think your lessons are enjoyable to students? Why and Why not?
9. Do you think you need to give all the information to your students in order for them to learn your subject? Why and Why not?
10. Do you think you would be able to implement critical thinking into your lessons if you were required to do so? Why and Why not?
11. Could the integration of technology enhance critical thinking skills in students? If so, how?
12. What digital activities have you utilized in instruction to promote critical thinking?

*Fulton Park School District is a pseudonym used for anonymity
Appendix F: “As Is” 4 C’s Analysis for Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

"As-Is" 4C’s Analysis for Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)

<table>
<thead>
<tr>
<th>Context</th>
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<tbody>
<tr>
<td>One primary school (among ten schools in one district).</td>
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<tr>
<td>District-wide curriculum for all core content areas.</td>
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<tr>
<td>District focused on balanced literacy and workshop model for the instruction of ELA and Math.</td>
</tr>
<tr>
<td>The delivery of traditional teacher-led instruction for all students is still somewhat present.</td>
</tr>
<tr>
<td>Teacher understanding of the definition of &quot;critical thinking.&quot;</td>
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<tr>
<td>Teacher belief that critical thinking skills are essential for all students to learn.</td>
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<tr>
<td>Teacher knowledge of Bloom’s Taxonomy/Webb’s Depth of Knowledge (DOK).</td>
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</table>

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<thead>
<tr>
<th>Culture</th>
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</thead>
<tbody>
<tr>
<td>Expectations that all students can learn.</td>
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<tr>
<td>Varying parental involvement amongst school families.</td>
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<tr>
<td>Teacher beliefs about the importance of teaching critical thinking skills in early grades.</td>
</tr>
<tr>
<td>Teacher uncertainty about how to implement critical thinking skills during core content instructional time.</td>
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<tr>
<td>The inconsistent view that &quot;all&quot; students can perform higher-order thinking (HOT) skills.</td>
</tr>
<tr>
<td>Lack of time spent on teaching critical thinking skills.</td>
</tr>
<tr>
<td>Teacher flexibility with instruction.</td>
</tr>
<tr>
<td>Lack of student background knowledge to assist with developing critical thinking skills.</td>
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</tbody>
</table>

| Primary teachers need to be better supported in acquiring knowledge, developing abilities, and having access to resources to develop critical thinking skills in students in grades K-2. |

<table>
<thead>
<tr>
<th>Conditions</th>
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</thead>
<tbody>
<tr>
<td>Lack of significant professional development for developing critical thinking skills.</td>
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<tr>
<td>Insufficient time for developing critical thinking activities and collaboration amongst teachers to share resources/instructional ideas.</td>
</tr>
<tr>
<td>Lack of time spent on teaching critical thinking skills in class.</td>
</tr>
<tr>
<td>The technology available (1:1 Ipads, abundance of apps, etc. available to students and teachers).</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Competencies</th>
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</thead>
<tbody>
<tr>
<td>Teacher efficacy is needed to develop essential skills in student learners.</td>
</tr>
<tr>
<td>Teacher’s lack of confidence in teaching these skills.</td>
</tr>
<tr>
<td>Lack of foundational skills or background knowledge for students to build upon skills.</td>
</tr>
<tr>
<td>Inconsistent implementation of critical thinking skills during instruction.</td>
</tr>
<tr>
<td>Traditional instructional practices are utilized, causing teachers to &quot;reteach brain&quot; how to be a critical thinker.</td>
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</tbody>
</table>
Appendix G: “To Be” 4 C’s Analysis for Self-Perception of Teachers’ Ability to Promote Critical Thinking Skills in Primary Grades (K-2)
Appendix H: Bloom’s Revised Taxonomy Aligned to Webb’s Depth of Knowledge

<table>
<thead>
<tr>
<th>BLOOM’S TAXONOMY</th>
<th>WEBB’S DOK</th>
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<tbody>
<tr>
<td><strong>KNOWLEDGE / REMEMBERING</strong>&lt;br&gt;“The recall of specifics and universals, involving little more than bringing to mind the appropriate material”</td>
<td><strong>RECALL</strong>&lt;br&gt;Recall of a fact, information, or procedure (e.g., What are 3 critical skill cues for the overhand throw?)</td>
</tr>
<tr>
<td><strong>COMPREHENSION / UNDERSTANDING</strong>&lt;br&gt;“Ability to process knowledge on a low level such that the knowledge can be reproduced or communicated without a verbatim repetition.”</td>
<td><strong>SKILL/CONCEPT</strong>&lt;br&gt;Use of information, conceptual knowledge, procedures, two or more steps, etc.</td>
</tr>
<tr>
<td><strong>APPLICATION / APPLYING</strong>&lt;br&gt;“Using information in another familiar situation.”</td>
<td><strong>STRATEGIC THINKING</strong>&lt;br&gt;Requires reasoning, developing a plan or sequence of steps; has some complexity; more than one possible answer</td>
</tr>
<tr>
<td><strong>ANALYSIS / ANALYSING</strong>&lt;br&gt;“Breaking information into parts to explore understandings and relationships.”</td>
<td><strong>EXTENDED THINKING</strong>&lt;br&gt;Requires an investigation; time to think and process multiple conditions of the problem or task</td>
</tr>
<tr>
<td><strong>SYNTHESIS and EVALUATION / EVALUATING and CREATING</strong>&lt;br&gt;“Putting together elements &amp; parts to form a whole, then making value judgments about the method.”</td>
<td></td>
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