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Critical Thinking Skills and Teacher Effectiveness of Pre-kindergarten Special Education Teachers

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CRITICAL THINKING SKILLS AND TEACHER EFFECTIVENESS
OF PRE-KINDERGARTEN SPECIAL EDUCATION TEACHERS

by

Nancy Sim

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
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ABSTRACT

CRITICAL THINKING SKILLS AND TEACHER EFFECTIVENESS OF PRE-KINDERGARTEN SPECIAL EDUCATION TEACHERS

by

Nancy Sim

The University of Wisconsin-Milwaukee, 2019
Under the Supervision of Professor Amy Otis-Wilborn

The critical thinking skills of pre-kindergarten special education teachers needed for effective education of their students are currently not known. This study used a mixed methods multi-case study design to answer the question: What is the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers? Vygotsky's theory of social constructivism guided the study design and data analysis of standardized measurements of critical thinking and effective teaching, observations, and interviews of ten pre-kindergarten special education teachers. Findings of the study included that a) the HCTA may not be a good measure of teacher critical thinking; b) teacher discussion of critical thinking related most closely to the CLASS dimension of concept development in the subcategory of instructional support; and c) teachers and pre-service teachers need opportunities to develop their knowledge base of behavioral and instructional strategies.

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CHAPTER 1: INTRODUCTION

The Connection Between Critical Thinking and Effective Instruction

Since Dewey (1910), critical thinking holds a prominent place in the study of education. Throughout the decades, theorists have struggled to both define and assess critical thinking. Unfortunately, there is still no universal definition or gold-standard assessment tool. At the same time, high-stakes tests for pre-service teachers appear to measure critical thinking skills as well as content knowledge. For example, the edTPA, which is an assessment of teacher readiness for the classroom, requires pre-service students to analyze their teaching and its effectiveness (Sato, 2014). This disconnect between theory and practice raises questions regarding the relationship between teachers' critical thinking skills and their abilities to teach effectively.

The emphasis on assessing pre-service teachers' critical thinking is based on the purported connection between critical thinking and quality instruction. Correlational studies indicate a lower moderate positive relationship between selections of reading strategies and dispositions for critical thinking (Akkaya, 2012), and a strong positive relationship between critical thinking skills and student-rated teaching effectiveness (Birjandi & Bagherkazemi, 2010). Unfortunately, there are few research studies regarding these relationships, and any measured correlation does not prove causality (Creswell, 2012).

In fact, the majority of education-related research focuses on the relationship of critical thinking to the demographics of pre- and in-service teachers, not on its possible connection to effective teaching. Researchers concur that the connection between critical thinking and teaching needs further exploration (Birjandi & Bagherkazemi, 2010; Choy & Oo, 2012; Pihlaja & Holst, 2013). Once this connection is explored and established, teacher preparation programs can

include effective instruction and experiences for pre-service teachers that explicitly connect critical thinking and effective teaching. Therefore, the intent of this study is to explore the connection between a teacher's critical thinking skills and his or her ability to teach effectively.

Significance of Study

Effective teachers are adept at planning lessons, preparing materials, maintaining positive classroom environments, using effective instructional techniques, and demonstrating professionalism (Danielson, 2007). Research correlates these teacher skills to student achievement (Borman & Kimball, 2005; Curby, Rimm-Kaufman, & Ponitz, 2009; Panayiotou, Kyriakides, Creemers, McMahon, Vanlaar, Pfeifer, Rekalikdou, & Bren, 2014; Stronge, Ward, & Grant, 2011). Specifically, at the pre-kindergarten level, research indicates a connection between a positive classroom climate and student literacy scores (Brock & Curby, 2014; Burchinal, Howes, Pianta, Bryant, Early, Clifford, & Barbarin, 2008; Howes, Burchinal, Pianta, Bryant, Early, Clifford, & Barbarin, 2008). What is not known is the role a teacher's critical thinking plays in his or her ability to create this positive early learning environment. To create stellar early childhood special education teacher preparation programs, the link between a teacher's critical thinking skills and his or her effectiveness as a teacher needs further exploration.

Purpose of Study

Therefore, this study examined the connection between critical thinking skills and effective teaching. Specifically, this mixed-methods study examined pre-kindergarten special education teachers' scores on critical thinking assessments, observed indicators of their teaching quality, and their stated thought processes in making strategic educational decisions. This study sought to answer the following global question and sub-questions:

What is the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers?

1. How do standardized measures of critical thinking and effective teaching reflect the relationship between these two constructs?
2. How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching?
3. How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking?

The purpose of this study was to better understand how pre-kindergarten special education teachers' critical thinking connected to teaching effectiveness. With a greater understanding of this connection, pre-service teacher education programs can include learning experiences for pre-service teachers that help them practice and apply specific critical thinking skills to improve classroom instruction. Research indicates that pre-service teachers need additional opportunities to examine and critique their instructional decisions (Kohler, Henning, & Usma-Wilches, 2008). Within this study, I explored how a pre-kindergarten special education teacher's critical thinking connected to strategic and effective teaching; this provided insight into what specific skills need further development in pre-service programs.

Outcomes

The outcomes of this study were to:

- determine the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers,

- identify the importance for pre-kindergarten special education teachers of critical thinking skills for emotional support, classroom organization, and instructional support, and
- identify which critical thinking skills pre-kindergarten special education teachers exhibit.

These outcomes led to a clearer understanding of how to create and implement special education pre-kindergarten pre-service teaching programs that include opportunities for pre-service teachers to develop and use optimal critical thinking skills to effectively instruct and assess all students.

Theoretical Framework

Inquiry worldview. I hold to an interpretivist worldview. Interpretivists believe reality is socially constructed by the researcher's pre-existing knowledge and culture. All research is affected by procedures and terms previously determined by researchers and scientists. (Willis, 2007). I agree that reality is socially constructed. As unbiased as I tried to be, I was still part of the teacher observations and interviews. Both the teachers I observed and interviewed as part of this study and I came to the interview with socially constructed views, experiences, and understanding. My personal viewpoints may have influenced my interpretation of teachers' thoughts. The teachers, in turn, may have modified their remarks to try to put themselves into a better-perceived position. The point of the research was not to seek absolute universal truth but rather to understand the critical thinking experiences of a small group of teachers within the context of their classrooms. The premise that reality is socially constructed and that reflection is the primary process for seeking understanding within a specific context follows an interpretivist paradigm (Willis, 2007).

Substantive content theories. One of the theoretical perspectives of this study was social constructivism based on the work of Lev Vygotsky. Social constructivism involves both social and cultural interactions coupled with acquired knowledge to develop and use critical thinking skills. Although mainly thought of in the realm of child development, Vygotsky's theory can also be extrapolated to apply to adult critical thinking. Vygotsky (1978) stated:

. . . the mind is not a complex network of general capabilities such as observation, attention, memory, judgment and so forth, but a set of specific capabilities, each of which is to some extent, independent of the other and is developed independently. Learning is more than the acquisition of the ability to think; it is the acquisition of many specialized abilities for thinking about a variety of things. (p. 83)

Vygotsky's "zone of proximal development" and support of scaffolding rely on the quality of discourse, significance of activity, and role of cultural tools (Shabani, Khatib, & Ebadi, 2010). Just as the zone of proximal development refers to what children can accomplish with and without help, the same concept can relate to teachers. Zone of proximal development, then, refers to what the teacher accomplishes by him or herself with support from a mentor, professional learning community (PLC), or other collaborative experience (Fani & Ghaemi, 2011).

People acquire knowledge through social interaction and the use of cultural tools. Later the knowledge may be internalized and considered an individual knowledge, but all learning starts as part of a social process (Sivan, 1986). According to Salomon and Perkins (1998), "Virtually anything one learns, according to the sociocultural view, comes deeply embedded in a cultural context, involves culturally informed and laden tools, and figures as part of a range of highly social activity systems, however alone the learner may be at particular moments" (p.16).

Critical thinking is culturally mediated. A person has to think about something, and the something is part of a culture (Cole & Wertsch, 1996).

Culture also provides the context out of which knowledge and tools are developed (Sivan, 1986). Social interaction includes the use of many cultural tools, especially language (Cole & Wertsch, 1996). Examples of additional tool are colleagues, books, and computers. All are based on culture and social constructs (Salomon & Perkins, 1998). Cultural tools are often thought of as supports of knowledge acquisition, but, instead, cultural tools are actually an integral part of the knowledge acquisition process (Cole & Wertsch, 1996).

From birth and ongoing, a person has to learn how to be a social learner. In social constructivist theory, this involves learning to collaborate with others and to question societal norms (Salomon & Perkins, 1998). Dewey (1963) stated:

[We] live from birth to death in a world of persons and things which is in large measure what it is because of what has been done and transmitted from previous human activities. When this fact is ignored, experience is treated as if it were something which goes on exclusively inside an individual's body and mind.

It ought not to be necessary to say that experience does not occur in a vacuum.

There are sources outside an individual which give rise to experience. (p. 39)

Social learning is an ongoing process that needed consideration when I researched how teachers plan and deliver effective instruction. Therefore, within a social constructivist lens, to understand critical thinking and how it is related to quality teaching required an understanding of how specific abilities, habits, and culture informed those skills necessary to provide quality instruction.

The purpose of this mixed methods study was to understand how pre-kindergarten special education teachers used critical thinking to teach effectively. Viewing their perceptions within a social constructivist lens, I identified the social, cultural, and educational influences that shaped a teacher's critical thinking skills and consequent teaching.

Research Method

A mixed methods research methodology was appropriate to this particular study (Creswell, 2012). Johnson, Onwuegbuzie, and Turner (2007) defined mixed methods research as “research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and collaboration” (p. 123). Within mixed methods research, qualitative research is dominant (QUAL + quan), quantitative research is dominant (QUAN + qual), or both qualitative and quantitative research are equally important (QUAN + QUAL) (DeCuir-Gunby & Schutz, 2016). In this specific study, the teacher interview qualitative data were the more dominant part of the research. Hence, this mixed method research was a qualitative dominant study (QUAL + quan). Specifically, I used a convergent parallel design. With this design, I collected qualitative and quantitative data separately and then merged the data (DeCuir-Gunby & Schutz, 2016; Fetters, Curry, & Creswell, 2013).

Definitions of Key Terms

Critical thinking. As defined by the 1990 Delphi Report (Facione, 1990), critical thinking is “purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (p. 2).

Decision making. Decision making is the process of analyzing a situation or event and choosing a course of action based upon the analysis.

Pre-kindergarten special education teachers. Pre-kindergarten special education teachers for the purpose of this study are educators who teach children 3-to-5 years of age and hold a Wisconsin 1809 - Early Childhood Special Education license.

Reflection. Reflection is the “thoughtful consideration and questioning of what we do, what works, and what doesn’t, and what premises and rationales underlie our thinking and that of others” (Hubball, Collins, & Pratt, 2005, p. 60).

Teacher quality. Teacher quality relates to the effectiveness of instruction for student learning.

Limitations

Limitations which may have affected this study are those inherent in qualitative-dominant mixed methods research studies, mainly potential researcher bias, small sample size, sample selection, and lack of generalizability. First, I based the research presented in this study on the initial hypothesis that there is a positive relationship between critical thinking skills and effective teaching. It is important that this bias did not cloud or obscure any data that indicated that the actual relationship was minimal or non-existing. Participants were recruited through a convenience sample. Both the small sample size and the use of convenience sampling eliminated the ability to generalize results to other populations.

Summary

Critical thinking is a much-discussed concept that has spurred multiple definitions and assessment tools. With high stakes testing, such as the edTPA, teaching critical thinking skills to pre-service teachers is an important topic. Yet most research to date centers on characteristics of

critical thinking mainly with regard to demographics. Few researchers have studied the relationship between critical thinking and effective teaching. However, this relationship is important to help pre-service teachers develop critical thinking skills to improve their teaching effectiveness. Hence, for this study, I used a social constructivist lens to explore the connection between a teacher's critical thinking skills and his or her ability to strategically and effectively teach.

CHAPTER 2: LITERATURE REVIEW

Introduction

Theorists struggle to both define and assess critical thinking. If the connection between critical thinking and effective instruction is better understood, specific topics need further discussion. In Part I of this review, I address the theoretical differences that are currently still in debate. I discuss the perspectives of different theorists to determine how their views on critical thinking connect to this study. In Part II, I review the characteristics of effective teaching, including its relationship to teacher demographics and teacher styles of learning. I summarize the current information regarding research on teachers and critical thinking. In Part III, I summarize the research regarding critical thinking and nurses. The importance of this summary is to connect what is known regarding teachers and critical thinking to the larger body of research involving nurses and critical thinking. Finally, I synthesize the information gleaned from this literature review to determine what is currently known and what questions exist regarding the relationship between teachers' critical thinking and effective instruction.

Part I: Theories of Critical Thinking Skills and Dispositions

Definition

McPeck stated in 1990 that critical thinking was challenging to understand due to the lack of a common definition. Now, nearly 30 years later, there is still no agreed-upon definition.

Bailin et al. (1999b) stated:

Agreement about teaching critical thinking persists only so long as theorists remain at the level of abstract discussion and permit their use of the

term to remain vague. As soon as they begin to spell out in more concrete terms what critical thinking consists in, what education attainments are required if one is to be a critical thinker, and what means are likely to be efficacious in teaching persons to think critically, that is to say, as soon as they *interpret* the term in such a way as to provide a clear *conception* of critical thinking, agreement evaporates.

(p. 285)

Although reflective thought can be traced back to Socrates and farther, Dewey (2012) is generally considered the first contemporary theorist to consider the need for critical thinking in education. Dewey (2012) stated reflective thought, i.e., critical thinking, occurs when “the ground or basis for a belief is deliberately sought and its adequacy to support the belief examined” (p. 1). Reflective thought involves scientific induction, which is the process whereby facts are collected and analyzed to support a theory or premise. According to Dewey (2012), this involves inquiry: “The essence of critical thinking is suspended judgment; and the essence of this suspense is inquiry to determine the nature of the problem before proceeding to attempt its solution” (p. 68). This inquiry into a problem or concerning event provides the basis for critical thinking.

Paul (1990) identified critical thinking as having the three components of “the perfection of thought, the elements of thought, and the domain of thought” (p 4). In order to successfully use these three components, a person must understand, formulate, analyze, and assess.

More simply, Ennis (1996) stated, “Critical thinking is reasonable reflective thinking focused on deciding what to believe or do” (p. 166). However, he further elaborated upon his definition by offering a list of critical thinking skills, which are the abilities to: identify the focus, analyze arguments, ask questions for clarification or challenge, define terms, form assumptions,

maintain credibility, observe key information, and use both deductive and inductive understanding (Ennis, 1991). This list of critical thinking skills includes further elaboration of the skills needed for the critical thinking Dewey (2012) referred to as inquiry.

In 1990, the American Philosophical Association convened a Delphi panel to identify key components of critical thinking. The Delphi method consists of a panel of persons selected for their expertise. The process consists of rounds where the panel discusses key points. After a determined number of rounds, the panel reaches a consensus regarding the targeted subject. Ultimately, the Delphi panel agreed upon six core skills with subcategories:

1. Interpretation (Categorization, Decoding Significance, and Clarifying Meaning)
2. Analysis (Examining Ideas, Identifying Arguments, Analyzing Arguments)
3. Evaluation (Assessing Claimed, Assessing Arguments)
4. Inference (Querying Evidence, Conjecturing Alternatives, Drawing Conclusions)
5. Explanation (Stating Results, Justifying Procedures, Presenting Arguments)
6. Self-Regulation (Self-examination, Self-correction) (Facione, 1990)

In contrast, Bailin et al. (1999b) stated three key features of critical thinking:

1. It should be purposeful. It should be used to determine what to do or believe.
2. The person consciously attempts to meet certain standards related to what constitutes good critical thinking.
3. It adequately meets these standards.

Halpern (1999) stated that critical thinking skills are tied to the probability of a successful outcome. Halpern (2009) stated that critical thinking is composed of reasoning, analyzing arguments, hypothesis testing, probability, decision making, problem-solving, and creative thinking. Although the six definitions put forth by these theorists are all different, all concur that

critical thinking involves inquiry. After agreement on inquiry, the theorists diverge on topics of dispositions, specific skills, and the moral aspects of critical thinking.

Critical Thinking as Skills versus Dispositions

Just as theorists disagreed on the definition of critical thinking, they also disagreed on multiple components of critical thinking. One such topic was the relationship between critical thinking skills and dispositions. While critical thinking skills are the ability to think critically, dispositions are the likelihood a person will think critically. According to Facione (1990), critical thinking dispositions include being “habitually inquisitive, well-informed, and, open-minded”. (p. 3) Dewey (1997) believed a person needs the dispositions as well as the ability to think critically. Dewey stated that an unconscious habit or attitude to critically think must come before the art of critically thinking. A person must first seek to want to identify and work toward the solution of a problem, or the process will not happen. Paul (1990), McPeck (1990), and Halpern (1999) basically concurred with Dewey. Paul agreed that as we critically think, we also develop the dispositions toward critical thinking, including perseverance and integrity. Paul stated that students must first learn the skills of critically thinking, i.e., (a) what the terms assumption, implication, inference, and conclusion mean; (b) how to identify an issue; and (c) to develop and support a strong argument. However, developing critical thinking in students is not a matter of learning these skills but, rather, the act of providing opportunities for active critical thinking. By using the skills to actively critically think, the student also ingrains the dispositions related to critical thinking. McPeck (1990) and Halpern (1999) also agreed that a person must have both the skills and the disposition to be considered a critical thinker.

Conversely, Ennis (1996) believed that critical thinking skills and dispositions are two separate constructs. Ennis suggested the placement of critical thinking dispositions into three

main categories, which are (a) care in truthfulness, i.e., according to Ennis, “to get it right” (p. 171), (b) seek honesty and clarity, and (c) be respectful of all persons. Therefore, pre-service teacher education programs should include both instruction in and assessment of critical thinking skills and dispositions.

Another perspective looks at critical thinking skills and dispositions as a triad. Perkins, Jay, and Tishman (1993) stated the three necessary components are (a) the sensitivity of the understanding of the appropriateness of the behavior; (b) the inclination toward the behavior, and (c) the ability to achieve the behavior. Ennis (1996) argued against Perkins, Jay, and Tishman’s perspective of three characteristics of critical thinking. He stated that a person might have a critical thinking disposition but not be inclined to use it unless he or she identifies a need to do so. Additionally, a person might feel the need to seek meaning without the ability to ask the necessary critical questions. Ennis, therefore, claimed sensitivities and abilities are not necessary for a person to have a disposition. In his view, without the sensitivity ability, the disposition is nearly useless. Ennis did admit, though, that someone who has developed a disposition toward critical thinking would likely be motivated to learn the necessary sensitivity and ability necessary to think critically. Over 20 years later, the importance of having a disposition toward critical thinking is still debated.

Critical Thinking as a General versus Specific Skill

Another aspect in question is whether critical thinking is general and transferable to all areas or whether it is domain specific. Halpern (1999) took the side that critical thinking skills can be taught generally and then applied across domains: “There are identifiable critical thinking skills that can be taught and learned, and when students learn these skills and apply them

appropriately, they become better thinkers” (p. 70). Therefore, Halpern believed critical thinking skills are global rather than context specific.

However, McPeck (1990) stated that skills taught in a separate course are not as useful as domain-specific critical thinking. He proposed that although general critical thinking skills are meant to maximize their use across domains, the generality of the skills, in fact, limit their use. In his opinion, instructors should teach skills within specific domains. He did acknowledge, though, that critical thinking related to some specific domains will generalize to other areas. McPeck (1990) also believed that those who hold the specific skills approach consider critical thinking skills context and content free. In other words, critical thinking skills can be taught in isolation without connection to specific text or material, and without connection to a specific environment. McPeck further believed these specific skills account for such a small part of the skill of critical thinking that teaching them in isolation is not necessary or sufficient for critical thinking. McPeck (1990) stated that critical thinking is neither a content-free general ability nor a specific set of skills but, rather, critical thinking involves a knowledge component and a critical component. In other words, a person must have the knowledge about which to critically think and the ability to critically think about the knowledge.

Still another theorist, Paul in 1990, also argued against discipline-specific instruction. He believed the interpretation of information in a specific argument follows through different perspectives. Paul believed critical thinking is more general and less domain specific than McPeck (1990) believed. Paul stressed that persons should understand that critical thinking skills are general. Although the content is necessary about which to think critically, it does not limit a person's ability to think. Paul (1990) also argued against McPeck that a person must have

something to argue about, i.e., that what a person critically thinks about and other acts of critical thinking cannot be separated.

Paul (1990) likened McPeck's argument against specific critical thinking skills to specific speech skills. Although a person has to speak about something, this does not mean specific speaking skills cannot be taught separately from a specific topic. In other words, a person with disfluency can practice speaking fluently on one topic and use the same skills to speak fluently on a different topic. Paul, like Halpern (1999), believed critical thinking skills are global and are easily generalized across contexts.

When writing in the early 20th century, Dewey (1997) stated the perspective that one must already be able to think before one can critically think, and, therefore, teaching critical thinking involves learning. Therefore, Dewey (1997) considered critical thinking as both general and specific. Any subject can be an intellectual pursuit in that it may initiate inquiry and reflection. Dewey argued that both sides are correct. Critical thinking is a global skill that can be taught within specific contexts.

A more contemporary theorist, Bailin (1998) believed that the teaching of critical thinking skills does not occur in isolation due to the importance of context. However, she also did not that believe critical thinking skills are automatically acquired when acquiring content knowledge. Instead, according to Bailin, in conjunction with Siegel (2003), active critical thinking needs to be consciously developed while learning content knowledge. Instead of considering whether critical thinking generalizes, Bailin et al. (1999a) believed the question should be what resources are needed to critically think within a specific context:

If the claim that critical thinking skills are generic is taken to mean that these skills can be applied in any context regardless of background knowledge,

then the claim seems false. Background knowledge in the particular area is a precondition for critical thinking to take place. A person cannot analyze a particular chemical compound if he or she does not know something about chemistry. (p. 271)

To Bailin (1998), the question of generalizability was not whether critical thinking transfers to different situations, but rather whether critical thinking resources are available to foster critical thinking across situations.

Critical Thinking as Good versus Bad

Another disagreement among theorists regarding critical thinking is whether critical thinking has to be inherently good. According to Dewey (1997), critical thinking is the use of good judgment. Good judgment consists of a problem, a process to organize the facts, an evaluation of the problem and, finally, a decision or conclusion based on the facts. Some theorists agreed with Dewey, especially Paul (1990) and Bailin (2007). According to Paul, intellectual skill without intellectual character allows critical thinking to support only a person's ambitions and prejudices. No matter how intellectually honest one strives to be, there will always be some bias or prejudice. Therefore, conversations with others are necessary to eliminate bias as much as possible and to allow for true critical thinking.

Bailin asserted that critical thinking is a form of good thinking. As such, Bailin and Siegel felt that a critical thinker must value good reasoning as well as other dispositions, such as fair-mindedness and respect for others (Bailin & Siegel, 2003). Thinking must be beneficial and purposeful to be considered critical thinking. To Bailin et al. (1999a), if a person critically thinks by happenstance, they are not genuinely thinking critically. Therefore, Dewey, Paul, and Bailin et al. (1999a) believed critical thinking dispositions and skills are intertwined.

Alternately, Ennis (1996) does not feel a definition of critical thinking should include caring for the good of society. Instead, he made the distinction that using critical thinking for the good of others should be considered a critical thinking disposition. Therefore, unlike Dewey (1997), Paul (1990), Bailin (2007), and Ennis (1996) believed critical thinking dispositions and skills are separate qualities.

Summary and Implications of Critical Thinking Theory

There are mixed opinions by theorists on the definition of critical thinking, its factors, and its purpose. Research of the critical thinking skills of pre-kindergarten special education teachers should include analysis of whether the critical thinking skills assessed by the Halpern Critical Thinking Assessment (HCTA) connect to the teacher effectiveness assessed by the Classroom Assessment Scoring system (CLASS). This connection is one of the research questions of this dissertation, which is the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers. Descriptions of the HCTA and CLASS assessments are found in Chapter 4.

As noted before, correlation does not prove causality. In addition, 10 teachers are not a large enough group of participants for statistical relevance. The importance of answering this question would be whether a course specifically covering critical thinking skills would strengthen the pre-service students' future abilities as teachers. Since the HCTA assesses general domain critical thinking skills, a correlation would tend to add credence to the theory that critical thinking skills can generalize to other courses and that a specific course in critical thinking might be beneficial for pre-service teachers. A lack of correlation would imply critical thinking skills do not generalize, and practice in any necessary critical thinking skills could be embedded in pre-

service courses. This is assuming that pre-kindergarten special education teachers need critical thinking to teach effectively.

Part II: Characteristics of Effective Teachers

Characteristics of Teachers and Critical Thinking

Critical Thinking Skills and Demographics. Multiple researchers have studied critical thinking skills and dispositions, such as grade point average, gender, and grade level. The relationship between critical thinking skills and demographics is mixed. This mixed relationship may be in part due to the varied populations or the various means of measuring critical thinking. These populations include individuals in nursing programs, college students with various majors, and teachers and college students in multiple countries. Various means of measurement include structured interviews, focus groups, and surveys, as well as multiple standardized assessments.

Grades as predictors of critical thinking dispositions. There was no correlation between the California Critical Thinking Dispositions Inventory (CCTDI) scores and grade point average (GPA) of 675 students who attended Cukurova University in Turkey (Ekinici & Aybek, 2010). On the other hand, in a different study, researchers found a correlation between grade point averages, SAT scores, and National Licensure Examination for Registered Nurses (NCLEX-RN) scores of 182 student nurses (Romeo, 2013). The differences between these two studies may be the populations or the different measures of critical thinking.

Gender and critical thinking dispositions. Much research indicates there is no significant difference in critical thinking disposition scores based on gender (Acisli, 2015; Ekinici & Aybek, 2010; Incikabi, Tuna & Biber, 2013; Amin Khandaghi, Pakmehr, & Amiri, 2011; Shim & Walczak, 2012). Yet, a large number of studies contradict these findings (Arslan, Gulveren, &

Aydin, 2014; Bers, McGoawan & Rubin, 1996; Besoluk & Onder, 2010; Bilen, Ercan & Akcaozoglu, 2013; Demirhan & Kiklukaya, 2014; Facione, Sanchez Facione & Gainen, 1995; Karagol & Bekmezci, 2015; Sahin, Tunca, Altinkurt & Yilmaz, 2016; Tumkaya, Aybek & Aldag, 2009; Walsh & Hardy, 1997). Again, different populations or the various tests used to measure critical thinking may contribute to the mixed results.

Critical thinking dispositions and grade level in school. Students in a master's degree program scored higher than students in a bachelor's degree program on total critical thinking dispositions (Besoluk & Onder, 2010). Two studies indicated that the CCTDI total scores of senior students were higher than students at lower grade levels (Demirhan & Koklukaya, 2014; Tumkaya et al., 2009). However, other studies of undergraduate students indicated total critical thinking scores on the CCTDI by student grade level did not have significant differences (Bilen, et al., 2013; Lampert, 2007). Additional factors of student demographics and program of study may contribute to the difference in scores.

Longitudinal changes in critical thinking dispositions. A review of studies regarding the change of critical thinking dispositions over time indicates that time is a crucial variable. Over a semester, critical thinking disposition scores may increase or even decrease (Bers et al., 1996). Even when gains were significant across a semester, these gains were modest (Carmel & Yeziarski, 2013). However, across four years of college experience, the gains in the total California Critical Thinking Dispositions Inventory (CCTDI) scores (Giancarlo & Facione, 2001) were significant. All sub-scores showed an increase between 40 to 50 points on average (statistically significant at $\alpha = .05$) except for truth-seeking, which had a score increase of below 40 points (Giancarlo & Facione, 2001). However, in other studies, CCTDI scores were not

significantly changed over four years in a nursing program (Profetto-McGrath, 2003; Stewart & Dempsey, 2005).

The one exception in one of the studies was the subscale of systematicity, which measures the diligence of a student's pursuit of inquiry (Profetto-McGrath, 2003). Their different populations may cause these contradictory results. Profetto-McGrath and Stewart and Dempsey studied student nurses, while Giancarlo and Facione studied students at a private Catholic University. Further research is necessary to help identify appropriate levels of critical thinking at each level in order for pre-service teachers to reach an optimum level of critical thinking by the end of their student teaching practicums.

Critical Thinking and Classroom Instruction

How a teacher chooses to instruct his or her class is determined by three concepts: (a) the needs of a specific group of students, (b) the content, and (c) the teacher's belief system (Kagan, 1992). Research indicates critical thinking skills can impact the effectiveness of teachers in all three ways (Akkaya, 2012; Birjandi & Bagherkazemi, 2010; Yang, 2012).

Context. First, the teachers' critical thinking skills are assets that help teachers understand their students in today's diverse society. Necessary critical thinking skills include being able to: (a) reflect critically about both the students and the curriculum, (b) understand students, families, and community, and, finally, (c) use critical thinking skills to meet students' needs (Stevens & Miretzky, 2014). These three skills are necessary to understand the environmental context so that the instruction of content can best meet the needs of the specific population of students.

Content. Second, critical thinking skills appear to be important in the effectiveness of teaching instruction. There is a correlation between the quality of teaching strategies used by

teachers and their critical thinking skills (Akkaya, 2012; Birjandi & Bagherkazemi, 2010; Yang, 2012). Although correlation does not assure causality, it does give credence to a possible connection between a teacher's critical thinking skills and his or her use of research-based effective instructional strategies. Conversely, 50 Iranian teachers completed the Watson-Glaser Thinking Appraisal while their students rated them using the Characteristics of Successful Iranian Teachers' Questionnaire. Although teachers' ages and years of experience increased their scores on the Watson Glaser Critical Thinking assessment, there was no significant correlation between critical thinking scores and successful teaching (Beizae & Akbari, 2017). More research is needed to study this discrepancy and explore results from other cultures.

Belief system. Third, teachers need to believe in the worth and value of all students. Teachers' respect for students and their critical thinking dispositions are correlated (Elizabeth, May, & Chee 2008; Şahin, et al., 2015). Together with critical thinking dispositions, teachers need critical thinking skills in order to alleviate the social inequities found in today's school systems. To effectively teach in today's society requires the teacher to create socially just classroom experiences that demonstrate accountability for high achievement for all students. This includes historically marginalized student populations (DeMatthews & Mawhinney, 2014; Poplin & Rivera; 2005). Therefore, effective teaching requires the teacher to identify inequities and problem-solve solutions, which both require critical thinking.

Summary and Implications of Characteristics of Teachers and Critical Thinking

Critical Thinking and Demographics. It is apparent that there are no consistent results concerning demographics and critical thinking skills. This inconsistency may be due to different populations, different critical thinking measurement tools, or some other unknown variable. This inconsistency supports the need to understand any potential connections between critical

thinking skills and demographics of the specific population of pre-kindergarten special education teachers.

Critical Thinking and Classroom Instruction. Research indicates that effective teachers use critical thinking to determine appropriate content. In order to determine appropriate content, effective teachers must understand the context and characteristics of their diverse students. Teachers must have the commitment and confidence necessary to successfully meet the needs of all students. Kagan (1992) indicated that teachers need to consider content, context, and their belief system in order to develop and provide effective instruction to all students. Teacher education programs should be cognizant of all three characteristics of effective teachers when developing program learning outcomes. In addition, it seems apparent that for teachers to determine content and context while reflecting on their belief systems requires critical thinking. This study explored how pre-kindergarten special education teachers considered content and context when critically thinking about effective instruction.

Characteristics of Effective Teachers

There are three areas of classroom climate that affect a young child's learning: emotional support, classroom organization, and instructional support (Brock & Curby, 2014). Research indicates that the child's improved learning due to a favorable pre-kindergarten climate continues into his or her elementary school years (Brock & Curby, 2014; Burchinal et al., 2008). In addition, given high-quality first-grade teachers, students in Tennessee who attended pre-kindergarten outperformed those students who did not attend pre-kindergarten (Swain, Springer, & Hofer, 2015). This research supports the importance of quality pre-kindergarten programs (Pianta et al., 2008).

Emotional support. Young children who are respected and emotionally supported by pre-kindergarten teachers show an increase in closeness, a decrease in student conflict (Brock & Curby, 2014; Burchinal et al., 2008), and improved growth in literacy (Curby et al., 2009; Guo, Piasta, Justice, & Kaderauek, 2010). In other words, the consistency of the emotional support a pre-kindergarten teacher provides correlates with a positive teacher-child relationship, which in turn supports the child’s social functioning and academic achievement.

Research also indicated that responsive teaching increases pre-kindergarteners’ overall achievement, including achievement related to literacy and language. Responsive teaching includes the emotional supports of active engagement, strategic scaffolding, increased student motivation, teacher-student discourse, set routines, and an intellectually rich environment (Hamre, Hatfield, Pianta, & Jamil, 2014). Teachers may need critical thinking skills to manage all these responsive teaching tasks necessary to create an emotionally warm classroom.

Classroom organization. Good classroom management and organization requires the pre-kindergarten teacher to make judgments regarding student behavior, lesson pacing, and efficient transitions. In return, good classroom organization correlates to an increase in kindergarten students' letter-word identification and sound awareness (Curby et al., 2009). Therefore, it is imperative that pre-kindergarten teachers provide effective classroom organization as well as effective instruction.

Instructional support. Instruction involves what Donald Schön (1986) referred to as “reflection-in-action.” (p. 27). This is the skill of identifying an event and adjusting as needed to get the desired outcome. In teaching, it is the ability to adapt instruction during a lesson to meet the immediate needs of the students. Research shows the quality of pre-kindergarten instruction is related to gains in both student language skills and reading skills (Burchinal et al., 2008).

Reflection-in-action is a critical thinking skill that aids teachers, including pre-kindergarten teachers, in their ability to deliver effective instruction.

A teacher's sense of collegiality with peer support also correlates highly with classroom quality of instruction. Collaboration between pre-kindergarten and kindergarten teachers eases the students' transition to kindergarten in two ways. First, those teachers tend to have more shared classroom routines and, second, they tend to have a better-aligned curriculum (Guo, Kadervak, Piasta, Justice, & McGinty, 2011). These two outcomes of teacher collaboration are therefore important for optimum student achievement.

Summary and Implications of Characteristics of Effective Teachers

Research supported the connection between a positive learning environment in the pre-kindergarten classroom and student achievement. Research also supported the importance of critical thinking skills of teachers in general. Therefore, it makes sense that pre-kindergarten teachers need to think critically to address the needs of their young students. This study explored how pre-kindergarten special education teachers discussed the importance of critical thinking in regard to effective instruction.

Teacher Decision Making

Before the 1970s, teachers were expected to follow a prescribed model for lesson planning, which consisted of the following steps:

1. Specify objectives.
2. Select learning activities.
3. Plan learning activities.
4. Select evaluation procedures. (Clark & Yinger, 1977; McCutcheon, 1980)

Researchers found that teachers did not follow these steps. Instead, teachers began with lesson activities and student needs (Clark & Yinger, 1977; McCutcheon, 1980; Yinger, 1980). Although counterintuitive, basing lessons on activities and student needs required critical thinking. Researchers referred to the critical thinking involved in this process as "purposeful and reflective" (Yinger, 1980, p. 107), "complex mental dialogue" (McCutcheon, 1980, p. 7), and "interactive decision making" (Clark & Yinger, 1977, p. 292). Lesson planning, thus, was thought to involve decision making based on critical thinking.

Currently teachers make a spectrum of choices each day regarding lesson planning, classroom management, and student assessment. Overall, though, the majority of teacher decision making relates to their growth as professionals regarding curriculum. In a longitudinal study of teachers from year one to year eight, the perceived most important choices evolved from concentrating on themselves to concentrating on student learning (Sawyer, 2001). In addition, from initially teaching to survive, teachers later developed the ability to make curricular decisions based on peer collaboration and reflection (Sawyer, 2001). In other words, as teachers gain confidence, they base their decisions on what students need to learn, which further improves student achievement.

At the pre-kindergarten level, research differs on how teachers make these curricular decisions. One study found pre-kindergarten teachers still make decisions about lesson planning by first selecting activities and examining resources and then considering curriculum second (Ramírez, Clemente, Recamán, Martín-Domínguez, & Rodríguez, 2016). In a different study, though, teacher decision making was most influenced by developmentally appropriate practice (DAP), which can be considered an overarching curriculum (Kilderry, 2012). Regardless of how teachers make curricular decisions, decision making itself resides within a teacher's value system

(Sawyer, 2001). This same value system plays an important role in a teacher's ability to think critically.

Decision-Making Summary and Implication

Additional research is needed to determine how a teacher's decision making, critical thinking, and value system are interrelated. If this relationship is understood, then pre-kindergarten pre-service education programs can include experiences to mentor pre-service teachers to understand and analyze the underlying complexity of their educational decisions.

Culture, Learning Styles, and Critical Thinking

When asked if critical thinking was a cultural phenomenon, Panofsky (1999) answered: "Is critical thinking culturally specific?" Our answer then and now is a mixed, two-part answer, both yes and no: no, critical thinking is not culturally specific because all cultures have forms of thinking which take a critical approach in some way. But part two of the answer is yes, critical thinking can be taken as culturally specific in the sense that what has been understood in academic contexts as critical thinking, what "counts" as critical thinking, is culturally specific, in the sense of specific to a particular form that critical thinking typically has been given in schooling. The suggestion is that multiple forms of critical thinking exist, but that one form has predominated in schooling in the United States (p. 41).

There is mixed support for the belief that critical thinking, as currently assessed, is biased toward Western thought. In a study of 420 prospective African teachers, the pre-service teachers representing Western culture scored higher on the Watson-Glaser Critical Thinking appraisal than those pre-service teachers who represented the traditional African culture of valuing

community over individuality (Grosser & Lombard, 2007). In a study, 102 ethnically Asian students and 210 ethnically New Zealand European students were given the Watson-Glaser Critical Thinking Appraisal Short Form. The New Zealand European students scored higher on the assessment than the Asian students; however, English language skills mediated the difference in scores (Lun, Fischer, & Ward, 2010). The findings of a qualitative study also found differences in critical thinking scores between Chinese-speaking and English-speaking college students because English was a second language for the Chinese-speaking students (Jones, 2005).

In a different study, when assessed for critical thinking in their native languages, English-speaking students from New Zealand and Japanese-speaking students from Japan scored similarly (Manalo, Kusumi, Koyasu, Michita, & Tanaka, 2013). On the other hand, when English-speaking nursing students from Australia and Chinese-speaking nursing students from Hong Kong were given the California Critical Thinking Disposition Inventory in their native languages, the students from Australia scored significantly higher (Tiwari, Avery, & Lai, 2003). Therefore, research studies contradict one another. It is not currently apparent what effect culture has on types of critical thinking.

Although there was a small-to-medium significant correlation between a teacher's total critical thinking dispositions and different thinking styles (Beşoluk & Önder, 2010; Emir, 2013), these differences might also relate to language barriers rather than actual differences. More important, research indicated that people use various thinking styles at various times, depending upon the context of the situation (Emir, 2013). The acquisition of critical thinking dispositions may be part of enculturation rather than direct instruction. Providing a culture that supports the acquisition of critical thinking dispositions includes models of good thinking, using

a rationale for the acceptance of critical thinking dispositions, practice with critical thinking skills, and feedback that supports the adoption of critical thinking dispositions (Tishman & Andrade, 1996).

In this way, thinking styles and critical thinking skills are similar, as they are both contextually bound. One hundred ninety students in a first-year college psychology course, randomly divided into two groups, answered critical thinking questions explicitly related to the content of the course and questions regarding general critical thinking skills. Students scored higher on content-specific questions that required critical thinking than the more global questions (Renaud & Murray, 2008). How context affects both learning styles and critical thinking skills needs further study.

Culture, Learning Styles, and Critical Thinking Summary and Implications

Since all societies are capable of critical thinking, the question is instead, are current critical thinking assessments biased toward the type of critical thinking common in Western societies? This question is beyond the scope of this study. However, this question has relevance here since the HCTA does assess a logic form of critical thinking and may or may not be relevant to assessing teachers' critical thinking skills regarding effective teaching.

Teaching Styles and Critical Thinking

How teachers instruct may affect how they use critical thinking skills. The manner in which teachers instruct is known as styles or perspectives. There are five styles of teaching, which are:

- transmission – teachers transfer information to students,
- developmental – teachers facilitate students' construction of their own meaning,

- apprenticeship – teachers transfer knowledge to students through modeling,
- nurturing - teachers facilitate student learning while also supporting the students' self-esteem, and
- social reform - teachers empower students to change themselves and society (Pratt, 1998).

For example, a teacher using a transmission style of teaching does not necessarily consider the students' emotional needs. Therefore, a teacher with a nurturing perspective may theoretically need to use more of Schön's reflection-in-action to meet the emotional needs of his or her students than a teacher who uses a transmission approach to teaching. Further research is needed to determine if there is a relationship between a teacher's use of critical thinking and his or her teaching perspective.

While this possible difference in critical thinking within each teaching perspective is not known, researchers have studied the connection between college professors and their teaching of critical thinking skills. Hubbell et al. (2005) stated a teaching perspective is “a lens through which educators view their work. Thus, university teachers may not be aware of their perspective because it is something they look through, rather than at, when teaching. A perspective on teaching is, therefore, a way of being” (p.64). Most professors feel they are embedding critical thinking skills within their teaching. However, many do not in practice succeed (Pratt, 1998). This disconnect between the professor's belief and actual practice may affect a pre-service teacher's later development of critical thinking.

Pre-service teachers may need to reflect on how critical thinking connects to their styles of teaching. The professor's style of teaching can influence the student's learning (Cacciamani, Cesareni, Matini, Ferrini, & Fujita, 2012; Chen, Kinshuk, Wei, & Liu, 2011). Also, professors

need to understand how their teaching style possibly differs from the learning style and future teaching style of their pre-service students. Professors at 44 universities completed the Teaching Perspectives Inventory (TPI). Overall their scores indicated that they scored highest in the developmental perspective, moderate in social reform, and low in apprenticeship and nurturing (Hubball et al., 2005). Therefore, the professors in teacher preparation programs who lecture (transmission) should know that pre-kindergarten teachers teach in a transmission style the least of all five styles (Collins & Pratt, 2011). As the connection between critical thinking and teaching perspectives is not known, the connection between a professor's teaching perspective and his or her pre-service teacher's teaching perspective is also not known.

Teaching Styles and Critical Thinking Summary and Implications

Being cognizant of teaching perspectives may further the ability to enhance a pre-service teacher's critical thinking as well as teaching quality. Disconcertingly, though, research indicated that college professors believe they are embedding critical thinking skills in their courses when they are not. Therefore, students may not receive practice in developing their critical thinking skills in many courses. This is not a problem if it appears that general critical thinking skills can be taught in one course and generalized to other courses. However, if critical thinking skills are domain specific, pre-service teachers will need to have critical thinking instruction embedded into their courses.

Critical Thinking and Reflection

Theoretical History of Reflection

Dewey. Dewey is usually considered the first contemporary theorist to consider the need for critical thinking and reflection in education. In the 1930s, Dewey put forth reflection as a five-step process: (a) incurring a problem or difficulty; (b) identifying the problem; (c) studying alternative solutions based on prior knowledge; (d) selecting a solution; and (e) analyzing the result (Dewey, 1986). Dewey emphasizes the need for prior knowledge on which to base reflection. According to Dewey (1997), reflection without prior experience is futile. Also, reflection creates dissonance: "Reflective thinking . . . means judgment suspended during further inquiry; and suspense is likely to be somewhat painful" (Dewey, 1997, p. 11). Dewey is one of the first to think of reflection as an iterative process. In addition, he believed observation needs to change into meaning rather than just viewed as an event (1986). Dewey (1997) referred to this as "a consecutive ordering in such a way that each determines the next as its proper outcome, while each, in turn, leans back on its predecessors" (p. 4). Dewey stressed the iterative process of critical reflection as an important component of effective teaching.

Kolb. David Kolb's experiential learning model, based on constructivism, espoused that learning comes from doing. A student may be at any of the four components of learning, depending on his or her learning style. However, the goal is to work through the different components (Kolb & Kolb, 2005). Kolb considered this process experiential learning. He theorized that reflection has four steps: (a) concrete experience; (b) reflective observation; (c) abstract conceptualism; and (d) active experimentation (Kolb & Kolb, 2005). In the same manner that Dewey viewed reflection as iterative, David Kolb viewed reflection as a process that folds into itself as thoughts are "formed and reformed through experience" (Kolb, 1984, p. 26).

Importantly, David Kolb also specifically stated an educator's job "is not only to implant new ideas but also to dispose of or modify old ones" (p. 28). David Kolb stated critical reflection is an iterative process that is important in the construction of knowledge.

Schön. Schön is known for his concepts on reflection-on-action and reflection-in-action. Reflection-on-action refers to the metacognitive action of either preplanning or debriefing. Alternatively, reflection-in-action is the reflection that happens during an event, many times thought of as "thinking on your feet" (Schön, 1987). Schön's work cautioned against the privileged knowledge of professionals as technicians rather than as reflective practitioners. He encouraged educators to use reflective practice as means to improve the inherent flaws in current educational practice: "What happens in such an educational bureaucracy when a teacher begins to think and act not as technical expert but as reflective practitioner? Her reflection-in-action poses a potential threat to the dynamically conservative system in which she lives" (Schön, 1983, p. 332). Schön believed reflection-on-action and reflection-in-action are crucial components of the improvement of a teacher's individual effective teaching, both for his or her classroom and for the overall education system.

Johns. Johns' (2011) model for structured reflection is different from other models in that it emphasized the importance of peer or mentor discussion. Through the sharing of experiences, Johns felt a greater understanding of events will emerge. The model is based on the process of identifying the event, the impact of the event, and additional impacts that could happen. It ends with the reflector's determination of what he or she would do next time the event occurs. Johns' (2011) model encompassed seven stages or areas of reflection:

1. Looking Out (What is the significant issue?)
2. Looking In (What are my thoughts and emotions?)

3. Aesthetics (What were my personal actions and the consequences of those actions?)
4. Personal (What are the emotional aspects of the event?)
5. Ethics (Did I act in an ethical manner?)
6. Empirical (What knowledge did I use or could I have used?)
7. Reflexivity (How will this event inform my future actions?)

Johns' structured reflection model, although designed for nursing, could resonate for other reflective practitioners such as educators.

Brookfield. Brookfield (1987) described reflective critical thinking as a process rather than an outcome that is meant to identify and challenge assumptions. He stated:

When we think critically we become aware of the diversity of values, behaviors, social structures and artistic forms in the world. Through realizing this diversity, our commitments to our own values, actions, and social structures are informed by a sense of humility; we gain an awareness that others in the world have the same sense of certainty we do but about ideas, values, and actions that are completely contrary to our own. (p. 5)

This challenge must include reflection upon the context of the situation and alternative viewpoints. Reflective critical thinking leads to what Brookfield called "reflective skepticism," which he defined as not taking for granted the universal truth of a statement merely because the authority has deemed it so. Rather, reflective skepticism rejects claims "to universal truth or to ultimate explanations" (p. 9). Brookfield therefore believed the process of critical thinking must include the consideration of alternative solutions.

Gänshirt. Gänshirt's philosophy of reflection, as Schön's, was based on the study of architecture. According to Gänshirt (2007): "The interplay of seeing, thinking and doing, the

reflection of one in the other through perception and expression, form the basis for design activity. Both the act and the process of design can be described using the metaphor of a cycle – a cycle of inextricably interwoven thoughts and actions . . . " (p. 78). Gänshirt (2007) listed the steps in his design cycle as (a) determining the task or situation; (b) identifying a possible solution; (c) fleshing out the design and details; and (d) comparing the revised idea to the initial problem and recycling through the process (p. 78). He referred to these steps as "perception, mental consideration, and the expression of inner ideas" (p. 79). The inner ideas, in return, become creative visual and verbal forms ready for critique. Gänshirt, as other theorists, believed that reflection is an iterative process.

Theoretical History of Reflection: Summary and Implication

Theories regarding reflection tend to have two key concepts in common. First, reflection includes prior knowledge, experience, and beliefs. Second, reflection is an iterative process that comes full circle from identifying the problem to assessing the outcome of the decision. Therefore, it is important to identify whether pre-kindergarten special education teachers base their decisions on prior knowledge and take time to analyze their decisions' success.

Levels of Reflection

As with different theories of reflection, there are multiple views of the levels of thought involved in reflection. An initial level differentiates reflection as merely "productive" or "nonproductive." Productive reflection is considered an analytical comment regarding learning, content, knowledge, or instruction. Nonproductive reflection mainly describes events or stated opinions without supportive analysis (Bayat, 2010). Other researchers used more involved categories of reflection (Oner & Adadan, 2011; Kaplan, Rupley, Sparks, & Holcomb, 2007; Orland-Barak, 2005; Hatton & Smith, 1995; Friedman & Schoen, 2009; King & Kitchener,

1994; Cohen-Sayag & Fischl, 2012; Jay & Johnson, 2002). These categories, or levels, are variously described by researchers. Most descriptions start with a descriptive level (Oner & Adadan, 2011; Jay & Johnson, 2002; Hatton & Smith, 1995). At this level, the person reflecting describes what is happening. No attempt is made to make meaning from the event. Again, although different researchers divide reflection into a different number of levels, the next agreed-upon level is often designated as trying to make meaning from the event. This meaning making may involve evaluating the event, raising questions, and revising goals (King & Kitchener, 1994; Jay & Johnson, 2002; Oner & Adadan, 2011; Hatton & Smith, 1995).

A common final level of reflection is critical reflection. Critical reflection involves constructing knowledge (King & Kitchner, 1994); making judgments (Jay & Johnson, 2002); and reviewing the event within socio-political contexts (Hatton & Smith, 1995; King & Kitchener, 1994).

Therefore, researchers measure reflection in multiple formats and through identification of different, yet similar, levels of reflective depth.

Pre-service and In-service Teachers' Levels of Reflection

There are multiple ways to measure pre-service teacher reflection. Researchers have used web-based portfolios (Oner & Adadan, 2011; Orland-Barak), videotaping (Bayat, 2010; Gelfuso & Dennis, 2014), journal writing (Bayat, 2010; Kaplan, et al., 2007), and written projects (Chitpin, Simon, & Galipeau, 2008). However, all but one of these studies (Oner & Adadan, 2011) indicated that pre-service teachers mainly reflect at lower levels, not reaching higher levels of reflection.

Reflection and Teacher Education Programs

Yost, Sentner, and Forlenza-Bailey (2000) identified four obstacles to pre-service teachers' reflecting at the desired critical thinking level in college education programs: (a) an

inadequate preparation by the program; (b) a rigid current epistemological belief system; (c) an objection to the necessary cognitive load and (d) a limited exposure to education research articles. Inadequate preparation and limited exposure to literature relate more to critical thinking skills, while epistemological beliefs and objection to critically thinking relate to critical thinking dispositions. The former is easier to remedy than the latter. However, Yost et al. (2000) stress that "producing teachers who will engage in critical reflection should be a primary mission of every teacher education program" (p. 47). As with critical thinking, this emphasis on reflection is only important if the connection between reflection and effective teaching is established.

Reflection and Culture

As with critical thinking and culture, research suggests that reflection supports Western thought and status quo (Fendler, 2003). In addition, research also indicates that pre-service teachers reflect at a low level of critical thinking (Bayat, 2010; Black, Sileo, & Prater, 2000; Cohen-Sayag & Fischl, 2012; Kaplan, et al., 2007; Orland-Barak, 2005). In defense of pre-service teachers, Black et al. (2000) argued that reflection at the level of the students is a precursor to higher level reflection, but students must first make sense of the topic or observation before they can move to identify and solve inconsistencies. In a qualitative study based on focus groups, pre-service teachers indicated that it was difficult to reflect upon a topic unless the topic was first fully understood (Abednia, Hovassapian, Teimournezhad, & Ghanbariet, 2013). Therefore, pre-service teachers need a clear understanding of topics on which they are expected to reflect.

One strategy to help address this prerequisite is peer collaboration. Orland-Barak (2005) found that portfolios constructed through peer collaboration included more reflective entries than those that pre-service teachers constructed alone. Whether using peer collaboration or other

strategies, students must have time and opportunity to work through the entire reflective process. If not, the attempts at reflection will end in responses that are considered to be at the lower level of reflection, such as in Black et al. (2000) and Orland-Barak (2005). Therefore, reflection is a qualitative process that initially depends on student understanding of the topic and can be enhanced by peer collaboration.

Levels of Reflection Summary and Implications

Although most pre-service teacher education programs value student reflection, research indicates that pre-service teachers reflect at lower levels. Both the importance of reflection for effective teaching and the optimum level of reflective thought need further exploration.

Critical Thinking and Collaboration

There is a connection between teacher collaboration and teacher decision making that connects to higher student achievement of pre-kindergarten students. Teacher collaboration among pre-kindergarten teachers increases student engagement (Guo, Justice, Sawyer, & Tompkins, 2011). Teachers who have a high sense of school community tend to provide higher quality instruction, emphasize student collaboration, and create warm, emotionally supportive environments (McGinty, Justice, & Rimm-Kaufman, 2008). This sense of school community supports the teacher collaboration that connects to teacher decision making.

Further, a culture of collaboration regarding beliefs, values, and ownership of new instructional practices enhances professional development (Gillentine, 2006). When teachers take part in collaborative discussions, openly discussing differing views, it is more likely they will reflect upon, and possibly change, their views and practices. This change happens when they (a) view teacher differences as opportunities to change, (b) are open to possibly changing their practices, and (c) value the shared discourse as beneficial to their growth. Those teachers who

see teacher discussions as an opportunity for growth are also more likely to self-reflect (Danielowich, 2012).

For example, pre-kindergarten teachers in Sweden took part in a collaborative educational process reflection (EPR), which was similar to a PLC. The teachers felt the experience was valuable in that they (a) gained a deeper understanding of pre-kindergarten education due to shared discussions; (b) received new ideas to improve routines, time management, and classroom arrangement; (c) enhanced their relationships with fellow teachers; and (d) gained a better understanding of their students (Bygdeson-Larsson, 2006). Professional development that includes specific teacher collaboration is important to increase teacher critical thinking.

Part III: Critical Thinking Skills of Nurses

The professions of teaching and nursing share many similarities. In most states, requirements for a degree as a teacher or as a registered nurse require a bachelor's degree and passage of one or more competency tests (Harris & Adams, 2007). Also, both are service oriented and require juggling the needs of multiple patients or students at the same time (Sveinsdóttir, Gunnarsdóttir, & Friðriksdóttir, 2007). The National League for Nursing (NLN) requires formal critical thinking instruction included in their accredited nursing programs (Huber & Kuncel, 2016). Consequently, the research on nurses and critical thinking may be beneficial to the study of teachers and critical thinking.

Critical thinking and decision making of nurses. Nurse educators viewed critical thinking as a combination of rational thought and intuition, contextual knowledge, and emotional support (Walthew, 2004). Education appears to increase the critical thinking skills of nurses.

Graduates of a master's degree in a nursing program in Ireland scored significantly higher on the Watson-Glaser Critical Thinking assessment than students who were starting a master's degree program in nursing. Interestingly though, the critical thinking scores of the nurses with master's degrees in Ireland were equivalent to nurses with bachelor's degrees in the United States (Drennan, 2010). This indicates that growth of nurses' critical thinking skills may connect to specific nursing preparation programs.

Research also indicates differences in critical thinking dispositions by country. Newly graduated nursing students in Norway who completed the CCTDI scored lower than nursing students in the United States and Canada, but higher than nursing students from Hong Kong, Australia, and Turkey (Wangensteen, Johansson, Björkström, & Nordström, 2010). With a sample of 232 practicing nurses, critical thinking dispositions were a significant predictor of the nurses' knowledge base, critical thinking skills, and nursing experiences. However, the researchers cautioned that high scores on critical thinking dispositions tests still may not translate to higher critical thinking skills in practice (Rapps, Riegel, & Glaser, 2001).

In addition, there is some concern as to whether the standardized tests based on classic logic accurately assess the critical thinking skills needed in the context of nursing (Walsh & Seldomridge, 2006). As with differences in nurses' critical thinking scores by years of education, this research also may indicate that growth of nurses' critical thinking skills may connect to specific nursing preparation programs across different countries.

Critical thinking and clinical judgment. Clinical judgment is clinical decision making that involves the ability to evaluate situations and quickly respond to patient needs (Bowles, 2000). Multiple studies have found weak-to-medium positive correlations between nurses' critical thinking skills and clinical judgments (Bowles, 2000, Brookes & Shepherd, 1990; Martin,

2002; Shin, 1998). However, other researchers found no significant correlation between the critical thinking and decision-making scores of nursing students (Giot, 2000; McCormick, 2014; Noohi, Karimi-Noghondar, & Haghdoost, 2012; Pardue, 1987). This lack of connection between nurses' critical thinking skills and decision making does not support the connections found in the research of these factors for teachers.

Critical thinking and professional competencies of nurses. Another study found a significant positive correlation between a nurse's critical thinking and his or her competency in caring, communication, teaching, managing, study, and professional self-growth abilities (Chang, Chang, Kuo, Yang, & Chou, 2011). This list of competencies aligns well to teaching competencies also. However, another study found no relationship between a nurse's critical thinking skills and professional competence (May, Edell, Butell, Doughty, & Langford, 1999; Maynard, 1996). The difference may be a result of the significant time gap between the studies.

Critical thinking and learning styles of nurses. A nurse's style of learning appears to affect critical thinking, although all styles of learning facilitate some increase in critical thinking (Andreou, Papastavrou, & Merkouris, 2014). In a study conducted in Saudi Arabia, there was no significant relationship between learning styles and critical thinking skills; however, there was a significant relationship between learning styles and critical thinking dispositions (Mahmoud, 2012). Also, in a study of 724 Korean nurses, researchers found a significant, though weak, positive correlation between learning styles and critical thinking (An & Yoo, 2008). Therefore, research is mixed on whether there are connections between a nurse's learning style and his or her critical thinking skills and dispositions.

Nursing faculties' barriers to student critical thinking. In a survey of 175 nursing faculty, the most significant perceived barrier to student critical thinking was the students

themselves. These barriers included preferring passive styles of learning versus active learning and hesitance to work on assignments in which they might not get high grades. The other two most indicated barriers were time constraints and the need to cover a large amount of content (Shell, 2001). Therefore, both intrinsic and extrinsic factors lead to nurses' barriers to critical thinking.

Critical thinking and its connection to nursing preparation programs. Researchers of best nursing practices indicate pre-nursing students need to learn content in a way that also increases critical thinking rather than concentrating on teaching them critical thinking skills independently (Walsh & Seldomridge, 2006). Integrating critical thinking skills into course content can be achieved by carefully choosing the skills necessary for nursing and embedding critical thinking into both the instruction and clinical practice of the nursing skills (Walsh & Seldomridge, 2006). Some best practices include journal writing, case studies, reflections, and concept maps (Walsh & Seldomridge, 2006). These research-based suggestions to develop nurses' critical thinking skills are comparable to suggestions to develop pre-service teachers' critical thinking skills.

Critical Thinking Skills of Nurses: Summary and Implications

Studies regarding critical thinking of nursing students reveal many of the same inconsistencies as studies of teachers and critical thinking. Research on teaching critical thinking skills in preparation programs is similar in both nursing and education. If these studies can be generalized to pre-kindergarten special education teachers, they would indicate a) the same inconsistencies in research results, but also b) add information regarding the practice of embedding instruction of critical thinking skills into preparation programs.

CHAPTER 3: DESIGN OF THE STUDY

There is research on teachers' critical thinking skills and their teaching effectiveness; the literature informally connects the two constructs. However, the connection has not been supported through formal research. Therefore, research is needed to clarify and explain this relationship. In this chapter, I discuss how literature-based propositions, my conceptual framework, and the resulting research questions determined the selection of a multi-case study mixed methods design.

Literature Based Propositions

Propositions help define research parameters that improve the feasibility of the study (Baxter & Jack, 2008; Yin, 2014). Based on my review of the literature, I used the following propositions to guide the direction of this study:

1. There is a correlation between the quality of a teacher's selected teaching strategies and critical thinking (Akkaya, 2012; Birjandi, & Bagherkazmi, 2010; Yang, 2012). In this study, I used standard instruments to measure both of these skills in pre-kindergarten special education teachers to understand the relationship between critical thinking and effective teaching.
2. Three areas of classroom climate linked with teaching effectiveness of a young child's learning are emotional support, classroom organization, and instructional support (Brock & Curby, 2014). In this study, I asked pre-kindergarten special education teachers to explain the importance of critical thinking to create emotional support, classroom organization, and instructional support in their classrooms.
3. Critical thinking includes: verbal reasoning skills; argument analysis skills; hypothesis testing using likelihood and uncertainty; and decision making and problem-solving skills

(Halpern, 2010a). In this study, I connected these critical thinking constructs to pre-kindergarten special education teachers' descriptions of their practice of critical thinking skills during the teaching process.

Role of Theoretical Framework

A researcher's theoretical framework influences all aspects of the research process (DeCuir-Gunby & Schutz, 2016). I chose to follow the interpretivism paradigm. An interpretivist view follows the belief that knowledge merges with its social context. Yanow (2006) paraphrases an example she attributes to Dick VrMeer when she stated:

A knock on the door at different times of day may produce identical sound wave sine curves, but what those sound waves mean differs if the knock comes at two in the afternoon and we are U.S. citizens sitting in a classroom in Hayward, California, in 2005 or if it comes at two in the morning and we are Jews hiding in an attic in Amsterdam in 1944. (p. 415)

Context is necessary for meaning. I believe the teachers' prior knowledge and experiences, as well as my own, affected what I learned from my interactions with pre-kindergarten special education teachers. Therefore, I attempted to remain cognizant of my interpretivist worldview and belief in social constructivism throughout this study.

As I was the one identifying teaching events and asking reflective questions, I became part of the pre-kindergarten special education teachers' experiences during this study from which they might socially derive new meaning. I needed to self-reflect during the interviews to not sway or otherwise intrude on the teachers' understanding and answers to the questions I asked. I tried to limit researcher bias by using an iterative process as I wrote case notes and analyzed data. I continually examined the research process to resist the line where social constructivism

ended and my influence began. I continually reflected on any bias I had for one viewpoint over an opposing viewpoint, such as whether teachers critically think.

Within an interpretivist view, the theoretical lens I used was social constructivism based on the work of Lev Vygotsky. Social constructivism involves both social and cultural interactions coupled with acquired knowledge to develop and use critical thinking skills. Therefore, understanding critical thinking and how it relates to quality teaching within a social constructivist lens requires an understanding of the specific abilities and habits that make up those skills necessary to provide quality instruction. By viewing the perceptions of pre-kindergarten special education teachers within a social constructivist lens, I strove to identify the social, cultural, and educational influences that shape a teacher's critical thinking skills and consequent decision-making skills.

Johnson et al. (2007) suggested that using mixed methods—that is, by combining quantitative and qualitative data—increased the significance of the research. The use of both qualitative and quantitative methods provided a stronger understanding of the research question than the use of either method on its own (Creswell, 2012). I used a predominantly qualitative multi-case study design using face-to-face interviews. The addition of quantitative measures of critical thinking (HCTA) and teacher effectiveness (CLASS) provided quantitative data that I compared to each other as well as compared to the information derived from the qualitative face-to-face interviews. Semi-structured interviews were conducive to QUAL + quan mixed methods research within an interpretivist paradigm in that they were both (a) flexible and allowed for emerging topics, and (b) allowed for co-construction of knowledge by the researcher and participant (DeCuir-Gunby & Schutz, 2016). Therefore, I chose to include both quantitative and qualitative data in my study.

Within the mixed methods design, I used a convergent parallel design. A convergent parallel design involves the concurrent compilation of qualitative and quantitative data. However, the data are analyzed separately and then integrated. This process allowed me to triangulate the findings. Hence, a convergent parallel design is also known as triangulation, or concurrent mixed methods design. (DeCuir-Gunby & Schutz, 2016). Two difficulties that can emerge from a convergent parallel design are that quantitative and qualitative data may be challenging to merge due to their inherent differences, and the possible contradiction of each other (DeCuir-Gunby & Schutz, 2016). The case study approach I followed aided in merging data, since it used a narrative approach rather than a statistical approach. I searched for recurrent themes within and across case studies. Regarding contradictive results, my analysis of these merged case studies allowed me to create a deeper understanding of the data (Wagner, Davidson, Pollini, Strathdee, Washburn, & Palinkas, 2012). I approached data contradictions as opportunities to learn more about critical thinking and teacher effectiveness.

Research-Based Frameworks

The focus of this study aimed at looking at two critical constructs: critical thinking and effective teaching. Therefore, I identified two research-based frameworks that assisted in collecting, organizing, and interpreting data. My theoretical framework for critical thinking followed the work of Halpern (1998), which dovetails well with social constructivism. Halpern stated, "Higher order thinking is thinking that is reflective, sensitive to the context, and self-motivated" (p. 451). I chose to use Halpern's view of critical thinking because it captured the type of critical thinking involved in teaching. Halpern referred to critical thinking as a process used to achieve a goal or outcome. The constructs she included in her view of critical thinking were verbal reasoning skills, argument analysis skills, skills in thinking as hypothesis testing,

using likelihood and uncertainty, and decision making and problem solving (Halpern, 2009). Therefore, I identified teaching events and teacher comments that were examples of Halpern's constructs of critical thinking, specifically Halpern's Multiprocess Model of Decision Making (Halpern, 2009, p. 311)

My theoretical framework related to effective teaching was the CLASS framework. The CLASS framework aligns to theories on child development. In addition, the CLASS framework follows the premise that there is a connection between teacher behavior and student learning (Hamre, Pianta, Mashburn, & Downer, 2007). This premise lends itself well to social constructivism in that the teacher's actions affect, and therefore are part of, the students' acquisition of knowledge.

Research Questions

Through a literature review, I articulated three propositions that provide support for the connection between critical thinking and teacher effectiveness in pre-kindergarten special education teachers. However, this left unanswered the significant question: How are pre-kindergarten special education teachers' critical thinking skills connected to their ability to teach effectively? Therefore, in this study, I sought to answer the global question regarding the connection between critical thinking and effective teaching for pre-kindergarten special education teachers by answering the following research questions:

1. How do standardized measures of critical thinking and effective teaching reflect the relationship between these two constructs?
2. How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching?

3. How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking?

Gathering Data

Participants. The criteria used to select participants were teachers who held a Wisconsin 1809 - Early Childhood Special Education license and currently taught in pre-kindergarten classrooms. Examples of acceptable classroom settings were pre-kindergarten classes affiliated with public or private schools and Head Start programs. However, all 10 teachers taught in public schools.

Step 1: I used a non-random purposeful sample of pre-kindergarten special education teachers. Purposeful sampling is used in qualitative research to select participants in order to develop a detailed understanding of a phenomenon (Creswell, 2012; Miles & Huberman, 1994). Via email, I contacted 11 teachers that I knew as previous students or previous cooperating teachers. Of those 11, seven accepted; three were no longer teaching in a pre-kindergarten classroom; and one declined. Then I emailed teachers identified as pre-kindergarten special education teachers on nearby school districts' websites. I emailed seven teachers. I received no response from four teachers. The three teachers who responded agreed to participate in the study. Therefore, 10 of the 18 teachers agreed to participate, for a 56% participation rate.

Step 2: After receiving the teachers' permissions to take part in the study, I observed them using the CLASS as a measure of effective teaching.

Step 3: I then interviewed them face-to-face to explore their thoughts regarding effective teaching, decision making and critical thinking.

Step 4: Finally, I asked them to complete the computer-based, 30 forced-choice section of the HCTA to provide perspective on critical thinking skills. I was not present when each

participant completed the HCTA. After all participants completed the HCTA, their scores were sent to me via email by Schuhfried Company, which manages the HCTA assessment program.

Setting. The observations took place in each participants' classrooms. Interviews also took place in the participants' classrooms. The participants completed the critical thinking assessment (HCTA) via computer after the observation and interview in a place acceptable to them.

Data Collection Methods

For this study, I collected quantitative data through the Halpern Critical Thinking Assessment (HCTA) and Classroom Assessment Scoring System (CLASS) and qualitative data through semi-structured interviews. In order to explore the connections among a teacher's critical thinking skills, decision-making, and her ability to teach effectively, data collection also included:

- measures of teachers' teaching effectiveness through the Classroom Assessment Scoring System (CLASS), an observational assessment protocol (Appendix C);
- semi-structured face-to-face interviews that examined the possible connections between the two indicated measures, which are critical thinking skills and observed teaching (Appendix D);
- participants' demographic information (Appendix A); and
- measures of teachers' critical thinking abilities using the Halpern Critical Thinking Assessment (HCTA), an online assessment (Appendix B).

For each teacher, the CLASS evaluation was scored first. This helped identify the specific teaching events to discuss during the face-to-face interview. The interview occurred second. Finally, I collected the participants' demographic information and asked them to complete the

HCTA online at a time convenient for them. The participants completed the HCTA last, so the HCTA scores did not affect my scoring of the CLASS assessments. Therefore, the scores were completely independent of each other.

Halpern Critical Thinking Assessment (HCTA). The purpose of the Halpern Critical Thinking Assessment (HCTA) is to assess critical thinking skills (Halpern, 2010a). The HCTA consists of 25 scenarios that mimic real-life situations. The online assessment requires the participants to select an answer to a multiple choice question regarding each scenario. The entire assessment takes approximately 30 minutes to complete. Scores organized within five categories are verbal reasoning skills, argument analysis skills, skills in thinking as hypothesis testing, using likelihood and uncertainty, and decision making and problem solving (Halpern, 2010a). Scores on the HCTA range from 0 to 100. A score below 25 indicates the participant scored in the below average category. A score between 25 and 74 indicates an average score. Finally, a score above 74 indicates an above average score (Halpern, 2010a).

Norm tables for the HCTA derive from scores of 450 adults from across the United States from the years 2009 to 2012. Ages ranged from 18 to 72, with an average age of 29. The sample skewed toward females (62%) with only 27% males and 11% unreported. However, this norming sample fit well with my participants' demographics. The pre-kindergarten special education teachers who agreed to participate in this study were females ranging in age from 24 to 45.

Construct validity is reported based on various studies rather than research specifically designed to evaluate validity evidence. That said, the evidence demonstrated low-to-moderate correlations between free recall and forced choice (.39 to .51), which appears to support test validity (Halpern, 2010b). For this study, the participants only answered the forced choice

questions, not the free recall questions. Appendix B contains an item from the forced choice portion of the test.

Classroom Assessment Scoring System (CLASS). The CLASS assessment for pre-kindergarten classrooms is designed to evaluate teaching effectiveness based on classroom quality. The assessment involves 20-minute classroom observations followed by 10-minute intervals for note taking. CLASS protocol recommends four to six observation cycles. The observer then rates classroom quality from low to high in 10 dimensions: positive climate, negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, and language modeling.

These 10 dimensions make up three composite domain scores, which are emotional support (positive climate, negative climate, teacher sensitivity, and regard for student perspectives); classroom organization (behavior management, productivity, instruction learning formats); and instructional support (concept development, quality of feedback, and language modeling) (Pianta et al., 2008). Next, the observer averages each dimension across the number of observations. Then the dimensions that make up each domain are combined and averaged. For each domain, scores can range from 1 to 7. A score of 1 or 2 is considered low. A score of 3, 4, or 5 is considered mid or average. Finally, a score of 6 or 7 is considered high and represents effective classroom instruction and environment (Pianta et al., 2008).

As with many assessment tools, the CLASS assessment tool has strengths and weaknesses. Construct and face validity are supported through examination of the CLASS by content experts. Concurrent validity evidence consists of comparison to the Early Childhood Environment Rating Scale-Revised (ECERS-R) (Harms, Clifford, & Cryer, 1998), with

correlations ranging from 0.33 (CLASS Emotional Support and ECERS-R Provisions) to 0.63 (CLASS Emotional Support and ECERS-R Interactions). These scores represent a moderate correlation between the two tests.

The most worrisome shortcoming of this tool is the lack of normative data. Although there are large samples of nearly 2,000 students across the United States, there are no norm tables (Pianta, La Paro, & Hamre, 2009). However, overall the CLASS assessment tool is considered appropriate as used in this study based on the reviews in the 19th Mental Measurements Yearbook (Carlson, Geisinger, & Johnson, 2014). In this resource, test reviewer Sarah Bonner stated that the CLASS manual and research data adequately supports use as a research instrument. As an example, Appendix C contains the Teacher Sensitivity section of the CLASS.

Semi-structured interviews. In this study, I aimed to discover a relationship between teachers' use of critical thinking skills in thinking about and engaging in effective teaching practices. I structured the interview to explore three areas.

First, using observation data gathered from the CLASS, I identified critical teaching events for each participant. A teaching event occurred when a teacher made a decision related to classroom organization, instructional strategy, or emotional support. The selected teaching events were based on the three CLASS domains to better connect the participants' CLASS scores to their understandings of decision making and critical thinking discussed in the face-to-face interviews.

I designed the face-to-face interview so the first set of questions explored the teacher's use of critical thinking directly related to each teaching event. The second set of questions focused on critical thinking skills as they related to the specific skills of providing student

emotional support, classroom organization, and instructional support. The final set of questions asked each participant to share perspectives on effective teaching and use of critical thinking skills that affected the decisions she made about her teaching. In constructing the interview guide, I chose questions that were nonjudgmental. I chose initial questions that were broad and open ended, with follow-up questions that probed for further details (Charmaz, 2014). Interview questions appear in Appendix D.

Procedures

I gathered and analyzed data in the following five phases:

Phase 1: I observed the selected participants teaching in their classrooms. Using the CLASS, I rated their overall skills in the areas of emotional support, classroom management, and instructional support. In addition, I identified classroom events that required the teachers to use critical thinking skills. I included these classroom events in Phase 2 interviews.

Phase 2: I interviewed the selected participants face-to-face. Interview questions included questions regarding the areas of effective teaching identified in the CLASS tool, as well as questions to identify their understanding of the critical thinking skills used during teaching. I used the teaching events identified in Phase I to serve as catalysts to explore effective teaching.

Phase 3: Participants completed the forced-choice section of the HTCA.

Phase 4: I analyzed each participant's data to create an individual profile. I used the NVivo computer software program to perform qualitative analysis. The NVivo is a qualitative data analysis computer software package produced by QSR International. I transcribed the interviews and coded for common themes. I created each single case study using the qualitative data analyzed with NVivo. I searched for links between teacher's descriptions and explanations related to critical thinking and effective teaching.

Phase 5: I compared and contrasted the individual case studies to create a cross-case conclusion that highlighted common themes and discussed outlier information. I included quantitative data at this point. I compared (a) teacher demographics and HTCA scores, (b) demographics and CLASS scores, and (c) HTCA and CLASS scores. I then combined the information from the qualitative and quantitative data to create a multi-case description. The qualitative data included comparing teacher discussion of specific teaching events to the Multiprocess Model of Decision Making (Halpern, 2009, p. 311) and themes derived from teacher discussion of the connection between critical thinking and effective teaching.

Coding Data. I conducted multiple coding phases. First, I used an initial coding to process levels of meaning. These levels of meaning were found line by line, sentence by sentence, or paragraph by paragraph, whichever captured the essence of the meaning (DeCuir-Gunby, Marshall, & McCulloch, 2011). I identified data related to the major concepts of my study, which are aspects of critical thinking as described in the HCTA and decision making regarding the three CLASS domains. As additional themes emerged, I expanded the focus of the study to include them. I analyzed codes I deemed most prevalent or important by reconnecting to previous data and connecting to new data (Charmaz, 2014). Initial codes appear in Appendix E. The final codes appear in Appendix F.

Initial coding. As levels of meaning were analyzed, I used a constant comparative method. I compared data with data, code, categories, and concepts (Charmaz, 2014). I moved back and forth from the participant's HCTA score, CLASS observation score (including measures of teacher's effectiveness in three sub-skill areas), and transcribed interview to compile data and focus on critical thinking and effective teaching.

I then created a data display of the effective teaching and critical thinking concepts. I reached data saturation at three junctures: (a) when I concluded there was enough information to replicate the study (O'Reilly & Parker, 2013; Walker, 2012), (b) when no new information was revealed (Guest, Bunce, & Johnson, 2006), and (c) when further coding at this initial stage was no longer feasible (Guest et al., 2006). My study is straightforward and could be replicated since I obtained enough information to create a successful analysis and since I ended coding after three iterations, which was appropriate given the number of participants and data. I believe more iterations would yield little new information. Therefore, I achieved data saturation.

Focused coding. After coding for meaning, I analyzed the codes and identified central themes. I continued to compare the identified central themes to initial data and codes. I drew verified inferences from the data by connecting data to the literature study. I moved from data reduction, display, and conclusions/verification as indicated in Miles and Huberman's (1994) interactive model (p. 12) (Figure 3.1). The process was circular rather than linear (Charmaz, 2014).

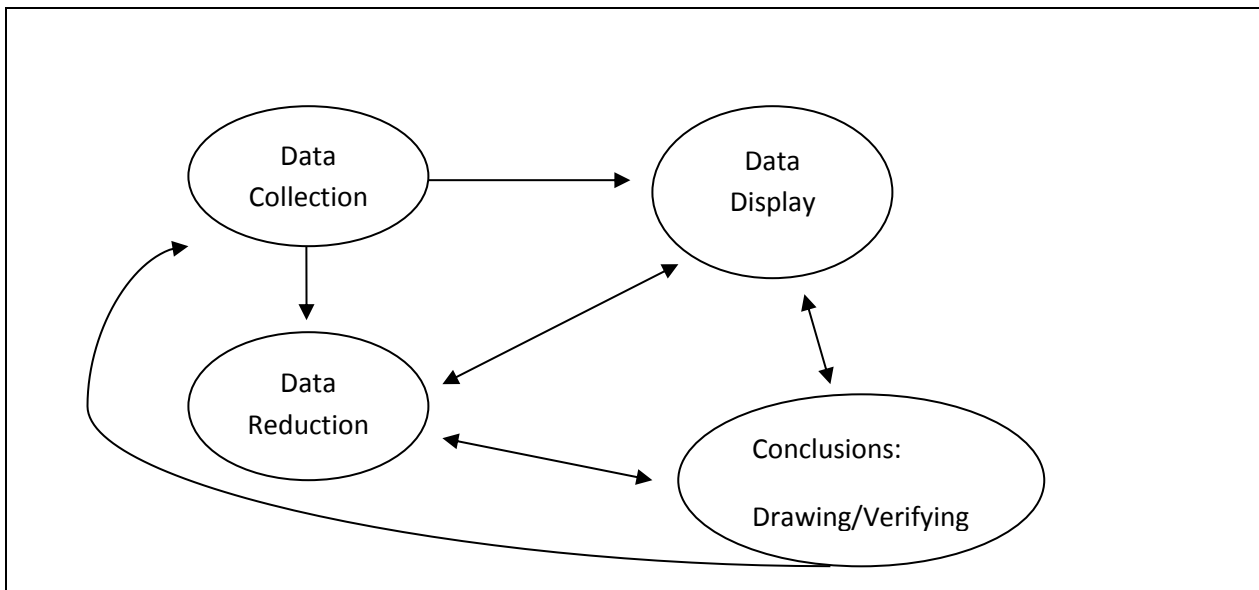


Figure 1. Components of Data Analysis: Interactive Model. (Miles & Huberman, 1994, p.12)

Memo Writing. I wrote memos to support focused coding. I maintained a constant reflexive state while I analyzed input data, codes, preconceptions, bias, and connections to theories. I used memos to add code categories to my coding and to identify further information to add to the literature review, including research on reflection.

Developing Codes. One way to generate codes relies on theories or conceptual frameworks (DeCuir-Gunby et al., 2011). I based initial codes on the critical thinking constructs identified in the HCTA (Halpern, 2010a) and the three domains of effective teaching identified in the CLASS (Pianta, et al., 2008). Miles and Huberman (1994) suggested the creation of a list of possible codes before the start of collecting data. These initial codes appear in Appendix E.

As I progressed through data analysis, I coded data and wrote memos on how pre-kindergarten special education teachers used their critical thinking skills to teach effectively and why they made the critical thinking decisions that they did. I created data-driven codes by identifying meaning through line by line, sentence by sentence, and paragraph by paragraph analysis. Codes I added using this process are found in Appendix F.

Individual Case Analysis

I considered each individual teacher to be one case study. To structure each case study, I followed Wolcott's (1994) framework of description, analysis, and interpretation (D-A-I-). I began each case study with a description of the observation and interview, which answered the question, "What is going on here?" Next, I analyzed the transcripts to identify the relationships between key factors such as decision making and critical thinking. Finally, I interpreted the case study to begin answering the overall research question regarding the relationship between critical thinking and effective teaching. The individual case studies are Appendix H.

Cross-Case Analysis

After I analyzed data for each individual case, I merged the individual qualitative case study data with the quantitative data. Using EXCEL, I created a scatterplot and calculated a correlation coefficient between the CLASS and HCTA scores. A scatterplot highlights similarities and contrasts by plotting the intersection of data points from the two dimensions (CLASS and HCTA scores) on horizontal and vertical axes (Miles & Huberman, 1994). I created graphs that compared the following data:

- CLASS scores and demographics
- HCTA scores and demographics
- HCTA and CLASS scores.

Next, I assigned categories of 1, 2, or 3 to the length of the teachers' discussions of the specific teaching events using Halpern's Multiprocess Model of Decision Making (2009). Two retired professors of special education rated the events also to assure reliability.

Finally, I analyzed the transcripts of teachers' discussions of the connection between critical thinking and effective teaching. I used the following graphs to identify themes:

- Number of teacher references to critical thinking,
- Comparison of HCTA to interview coded references,
- Comparison of teacher references to critical thinking and CLASS categories, and
- Number of teacher references to critical thinking and effective teaching.

Research Quality

The four most prevalent arguments for interpretative research quality are thick description, trustworthiness, reflexivity, and triangulation (Yanow & Schwartz-Shea, 2006). To assure research quality, I included all four procedures, which are detailed next.

Thick description. According to Schwartz-Shea (2006), achievement of thick description requires "sufficient detail of an event, setting, person, or interaction to capture context-specific nuances of meaning such that the researcher's interpretation is supported by 'thickly descriptive' evidentiary data" (p. 101). Analyzing and merging quantitative and qualitative data is one method to create thick description due to multiple sources and triangulation (Johnson, Onwuegbuzie, & Turner, 2007). In this study, I included thick description of the meanings pre-kindergarten special education teachers attributed to their classroom decisions during instruction.

Trustworthiness. Trustworthiness refers to the researcher's compliance with standards of reliability and validity (Yanow & Schwartz-Shea, 2006). I was the primary evaluator and attended a two-day training workshop conducted by a certified CLASS master coder and passed a reliability test. I also used interrater reliability to verify data collection. The second evaluator was an associate professor of education with over 40 years of experience in teaching and assessment. I trained her in using the CLASS assessment tool before the beginning of data collection. We then jointly observed two participants, completing the CLASS observation separately. On the first assessment, we were in 100% agreement. On the second assessment, we were at a 75% perfect match and a 95% match within one score. We discussed and came to an agreement on the differences in scores. These two co-assessments met my initial inter-reliability rating target within a one point difference of each other in each sub score 80% of the time. As

well as taking the above measures to improve reliability, I took the following steps to validate findings (Connelly, 2016; Creswell, 2012):

- By including multiple case studies, I helped assure the study was adequate and appropriate. Cross-case analysis using multiple case studies keeps the benefits of studying one case in depth with an increase in understanding and explanation brought by studying multiple cases (Miles & Huberman, 1994).
- I developed an audit trail that contained transcripts, coding, CLASS and HCTA participant scores, and researcher notes. The objective was to be as clear and transparent as possible in order to demonstrate the quality of the research (Schwartz-Shea, 2015).
- Each participant had the opportunity to read and verify the notes that specifically related to her. Participant feedback supports the study's validity on how well it represents the participants' thoughts and ideas. It is the techniques of going back, showing the interview transcripts, and asking if they reflected what the participants meant (Schwartz-Shea, 2015). There were no objections to the transcripts.
- I analyzed the negative cases that were part of my study. The purpose of examining negative cases was to provide evidence that I examined all data, not just evidence that confirmed my chosen conclusion regarding critical thinking and effective teaching (Schwartz-Shea, 2015).

These steps in combination assured I followed standard best practices to assure my study was reliable and valid.

Reflexivity. Reflexivity is "an overall scholarly attitude, that is, a keen awareness of, and theorizing about, the role of the self in all phases of the research process" (Schwartz-Shea, 2006, p. 102). My interpretivist view lent itself well to reflexivity. I believed I could not separate

myself from the research and reflected on possible bias throughout the research process. I accomplished this through memo writing.

Triangulation. Triangulation means using multiple methods for collecting data about the same concept under study. Triangulation is vital because it helps identify similarities and differences in the data results, which add to the quality of the study. The data I triangulated in this study were descriptive statistics, HCTA scores, CLASS scores, and information derived from face-to-face interviews.

Ethical considerations. Participation in this study was voluntary. Participants were pre-kindergarten special education teachers who gave written informed consent before participation. I notified participants they had the right to withdraw from the study at any time. The consent form is in Appendix G. Two participants chose to not complete the last part of the study, which was the HCTA test. Participants remained anonymous; I have not included any identifying information in this discussion of the study. I received Institutional Review Board consent before the start of this study. Therefore, there should be no harm to participants from this study.

Summary

In this chapter, I provided an overview of my theoretical framework based on interpretivism, social constructivism, critical thinking constructs, and domains of effective instruction. I identified four propositions based on a review of the literature. These three propositions served as the base for the three questions I developed to help answer the overarching question regarding the connection between a teacher's critical thinking skills and her ability to teach effectively. I then described the procedures I used in my study to gather and analyze data. Finally, I described the procedures I followed to support interpretative research quality. In the next chapter, I discuss the findings that emerged from the analysis of my data.

CHAPTER 4: FINDINGS

This study's overarching question is: What is the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers? In order to answer this question, I chose a mixed methods multiple case study design. Using a convenience sample, I identified 10 teachers to participate in the study. I observed the teachers teaching in their classrooms and rated their teaching effectiveness with the Classroom Scoring Assessment System (CLASS). I interviewed the teachers and asked them to describe further specific teaching events that might require critical thinking. Finally, the teachers completed the Halpern Critical Thinking Assessment (HCTA). Through these tools, I compiled data to answer the following questions:

1. How do standardized measures of critical thinking and effective teaching reflect the relationship between these two concepts?
2. How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching?
3. How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking?

Standardized Measures of Critical Thinking and Effective Teaching

This study sought to determine if a relationship between standardized scores of teacher critical thinking and effective teaching could be identified. I used the HCTA to measure teacher critical thinking and the CLASS to measure teacher effective teaching. After collecting the data, I compared the CLASS and HCTA standardized assessments. Table 1 includes the CLASS and

HCTA scores of eight of the 10 teachers. Two teachers did not complete the HCTA and therefore were not included in the table.

Table 1: *Teacher Scores on CLASS and HCTA*

Teacher	CLASS	HCTA (percentile)
Erica	7	48
Anna	7	31
KJ	7	27
Meghan	6.5	86
Rebecca	6.5	11
Lila	6	40
Mariah	5.8	70
Cherity	5.6	35

Upon visual inspection, the scores did not appear to have any set pattern. For example, both Rebecca and Meghan received a score of 6.5 using the CLASS assessment tool. However, Rebecca received a score of 11 on the HCTA assessment while Meghan received a score of 86.

Next, I used these data of teachers' CLASS and HCTA scores and created a scatterplot.

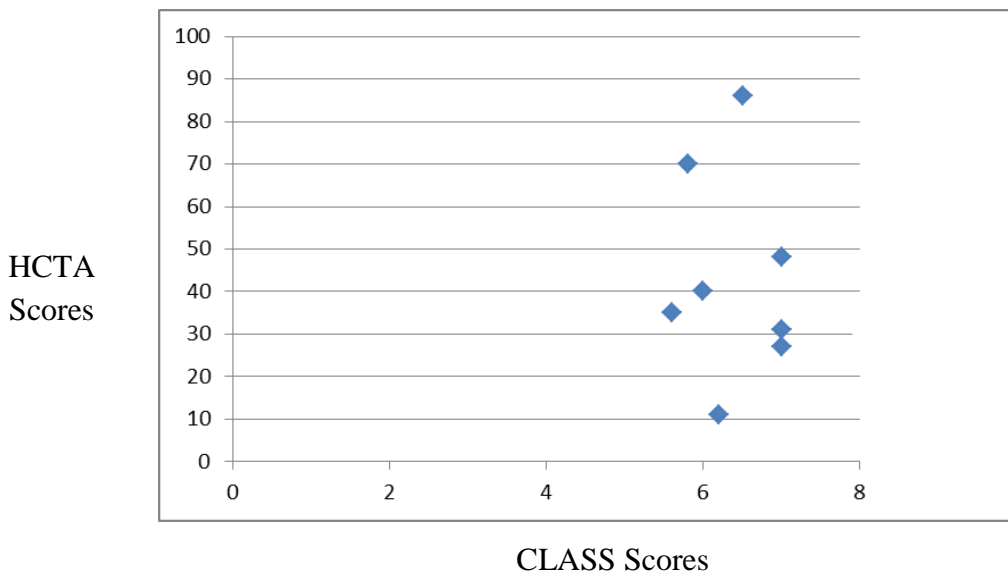


Figure 2. Scatterplot of Teachers' HCTA and CLASS Scores

I then calculated a correlation between the CLASS scores and the HTCA scores. This correlation was -0.12 , $r(6) = -0.12$, $p > .05$, which is not statistically relevant. In addition, the HCTA reported teacher scores are ordinal and therefore, it can only be assumed the numerical distance between score categories are equal. In Tables 2 through 4, I further arranged the data in multiple ways including comparing CLASS subtest scores to the HCTA scores, and comparing both the CLASS and HCTA scores to demographics.

Table 2: *CLASS Scores and Demographics Comparison*

Case Studies	CLASS Scores	Years of Experience	Environment	Path to Teaching License	Age	Level of Education
CLASS Scores Perfect						
Case Study 1: Anna	7.0	16	Rural – 12 Urban – 4	Post-Bac.	43	Masters
Case Study 2: Erica	7.0	12	Midsize town	Post-Bac.	43	Bachelors
Case Study 3: KJ	7.0	10	Midsize – 7 Small City – 3	Tradition	34	Bachelors
CLASS Scores High						
Case Study 4: Cara	6.63	7	Rural	Tradition	31	Bachelors
Case Study 5: Rebecca	6.5	16	Small City	Tradition	43	Bachelors
Case Study 6: Meghan	6.5	19	Rural – 16 Midsize – 3	Tradition	43	Bachelors
Case Study 7: Lila	6.0	3	Rural	Tradition	26	Bachelors
CLASS Scores Average						
Case Study 8: Mariah	5.8	10	Midsize Town	Tradition	34	Bachelors
Case Study 9: Cherity	5.6	9	Urban	Post-Bac	45	Bachelors
Case Study 10: Tosha	5.1	1.5	Rural	Tradition	24	Bachelors

Table 3: *HCTA Scores and Demographics Comparison*

Case Studies	HCTA Scores	Years of Experience	Environment	Path to Teaching License	Age	Level of Education
HCTA Scores High						
Case Study 1: Meghan	86	19	Rural – 16 Midsize Town - 3	Tradition	43	Bachelors
HCTA Scores Average						
Case Study 2: Mariah	70	10	Midsize Town	Tradition	34	Bachelors
Case Study 3: Erica	48	12	Midsize town	Post-Bac.	43	Bachelors
Case Study 4: Lila	40	3	Rural	Tradition	26	Bachelors
Case Study 5: Cherity	35	9	Urban	Post-Bac	45	Bachelors
Case Study 6: Anna	31	16	Rural – 12 Urban - 4	Post-Bac.	43	Masters
Case Study 7: KJ	27	10	Midsize – 7 Small City - 3	Tradition	34	Bachelors
HCTA Scores Low						
Case Study 8: Rebecca	11	16	Small City	Tradition	43	Bachelors

Table 4: HCTA scores and CLASS components.

CLASS COMPONENTS	High HCTA Scores	Average HCTA Scores	Low HCTA Scores
Instructional Support	7	6.75	6.5
Emotional Support	6.3	6.35	6.5
Classroom Organization	6.5	6.1	6.2

All three comparison tables seem to indicate the connection between the teachers' HCTA scores and other factors were random.

The first research question was: How do standardized measures of critical thinking and effective teaching reflect the relationship between these two constructs? The analysis of the data indicates that no trends were apparent.

Relationship Between Critical Thinking and Effective Teaching

During each teacher observation, I identified a teaching event that required the teacher to critically think, either before, during, or after instruction. During the interviews, I questioned the teachers about the events to determine their critical thinking thought processes.

Halpern (2009) views the terms decision making, problem solving, and creative thinking as overlapping. In the HCTA, which Halpern developed, problem solving and decision making form one component of the assessment. Halpern therefore recommends the use of her decision making framework to understand all three concepts:

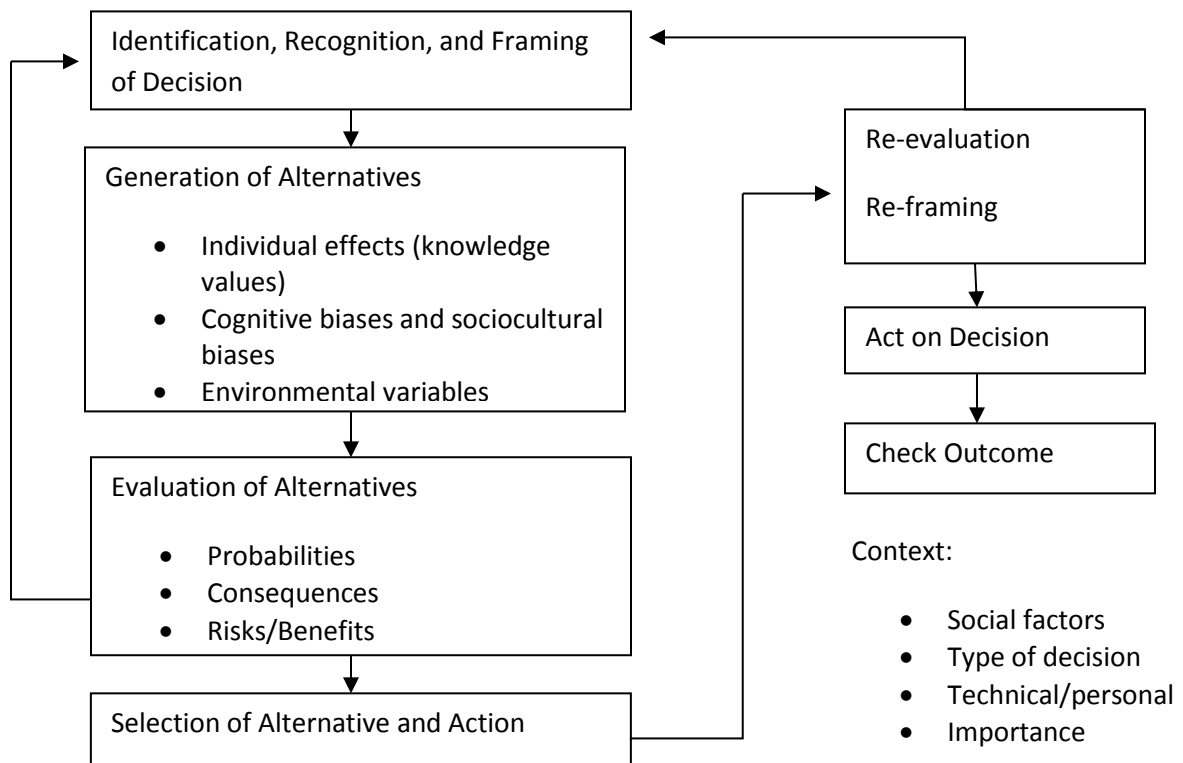


Figure 3: A Multiprocess Model of Decision Making (Halpern, 2009, p. 311)

All 10 teachers' critical thinking thought processes can be mapped to Halpern's Multiprocess Model of Decision Making. After mapping the teacher's discussion of the significant events to the decision making model, I rated the discussions as a one, two, or three, depending on how much of the model was reflected in their discussions. To determine inter-rater reliability, a retired college professor with over 40 years' experience in special education read the teachers' transcripts of the significant events and rated the transcripts following the same procedure. The inter-rater reliability score was 80%. Finally, another retired special education professor with over 35 years' experience rated the two transcripts that had discrepant ratings. Using all three ratings and discussion among the three of us, we were in 100% agreement for the following ratings:

Table 5: *Comparison of CLASS Scores and Decision Making Model Scores.*

Teachers	CLASS Scores	Decision Making Model Scores
Anna	7.0	3
KJ	7.0	3
Erica	7.0	2
Cara	6.63	2
Rebecca	6.5	2
Meghan	6.5	3
Lila	6.0	1
Mariah	5.8	2
Cherity	5.6	2
Tosha	5.1	1

Identification and Recognition of Problem (Score of One)

Two teachers did not use critical thinking with regard to the event. Tosha realized her students needed handwriting support. She collaborated with an occupational therapist and used the therapist's suggestions rather than making the decisions herself. Tosha identified the problem but used collaboration to solve the problem rather than the decision making process. Lila quickly asked a student to sit down when the student refused to cooperate. Lila stated she would have to critically think about the incident and come up with a better strategy later. She felt unsure of her immediate decision regarding the student and stated that thinking about the event further would help her in the future. Figure 4 indicates the relationship between Lila's and Tosha's actions and Halpern's (2009) decision making model.

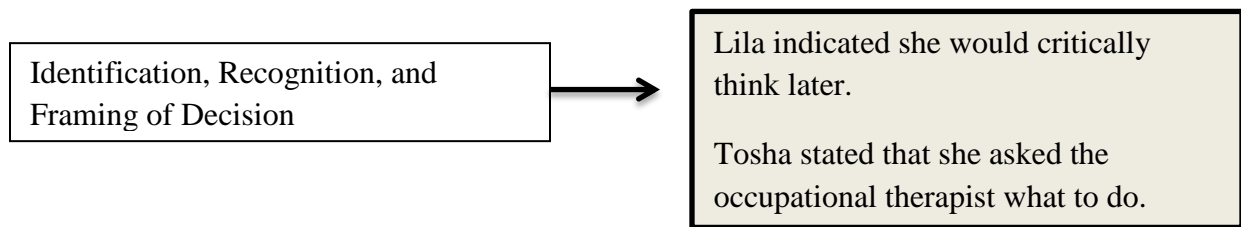


Figure 4: Decision Making Model Level One

Evaluation of One Alternative and Action (Score of Two)

Three teachers used decision making in the moment. Mariah usually passed objects with names that started with the targeted letter. She noticed on Saint Patrick's Day that her students were overly excited and were struggling to sit still. She thought about what might happen if she passed the objects and decided the better choice was to keep the objects herself and just show them to her students.

Cherity was involved in discussion with her students when she heard one of her students crying in the hallway. She made the decision to stop her discussion and comfort the student. She made this decision based on her personal belief that emotional needs of students must be met first before they can learn.

Rebecca had previously talked to her students about respecting one another. Therefore, when two children argued, she called them over, kneeled down to their size, and reminded them about their previous conversations about respecting one another. She then sent them to two different activity centers to de-escalate the situation.

Both Erica and Cara used Halpern's decision making process before the event. Erica observed her students and thought about the different levels of support they needed to ride tricycles. Then she planned how much support each student would need based on her previous knowledge of each student. Cara decided she wanted to find opportunities for children to have choices in her classroom. She decided to allow her students to choose what each wanted to be in the sensory table. She anticipated they might choose dirt since this was a novel material for the classroom. The students chose dirt as she anticipated but also requested grass. Cara went to her supply closet to see what options she had. She chose to cut green pipe cleaners into three-inch pieces. Both Erica and Cara made one decision prior to the activity, and then Cara made one additional decision during the activity. Figure 5 shows the relationship between the levels of Halpern's (2009) decision making model that connect to the problem solving discussions of Mariah, Cherity, Rebecca, and Erica.

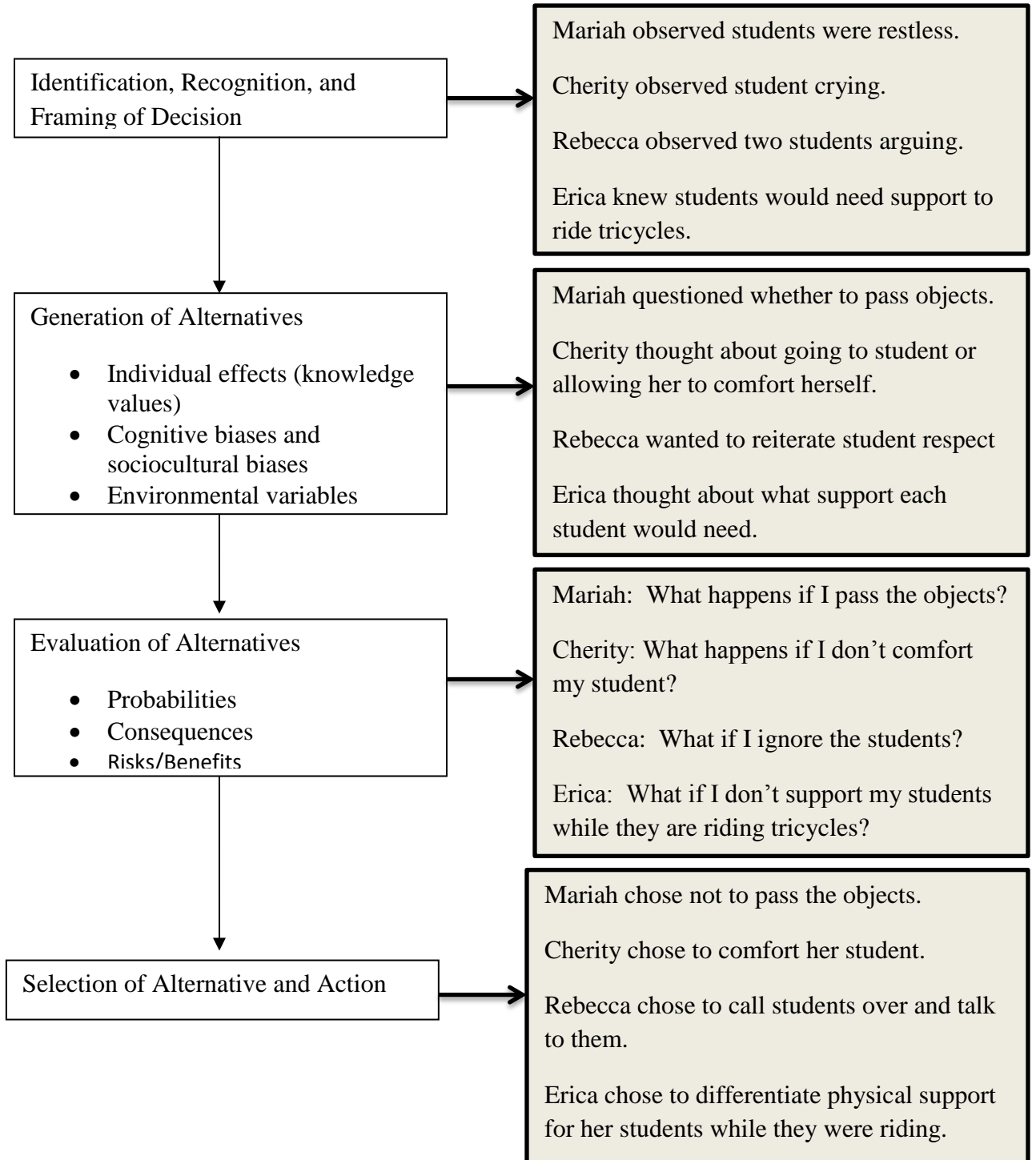


Figure 5: Decision Making Model Level Two

Complete Cycle of the Decision Making Model (Score of Three)

KJ observed a student at the beginning of the school year becoming agitated and acting out on numerous occasions. KJ first tried sending the child to the cool-out corner, but this only escalated his behavior. KJ found that kneeling down beside the student and calmly talking to him about how he was feeling worked for most instances of his acting out. For the student's more emotional outbursts, KJ found if she went to the cool-down corner with him and talked to him using pictures of emotions, she could usually help him calm down. Meghan struggled with keeping her students' attention in the classroom when other students were completing other activities. She first decided to invite more students to join the group. However, these students with higher abilities took over the group. Then she tried taking her original group out into the hallway to work. This solved the problem and has become part of the students' routine. Finally, Anna observed a student becoming restless and agitated during lessons. When she tried to place a hand on the student's back, Anna found the agitation worsened. She used a problem-solving process to determine that the best action was to offer the student a weighted vest. All three of these teachers used the complete process involved in Halpern's decision making model. They identified the problem, generated alternatives, and selected an action. KJ, Meghan, and Anna continued through the decision making model. They selected, implemented, and evaluated strategies. When they determined the strategies didn't work, they repeated the process with new strategies. They each found strategies that worked, and they continue to use them as needed.

Figure 6 shows the relationship between the levels of Halpern's (2009) decision making model that connect to the problem solving discussions of KJ, Meghan, and Anna.

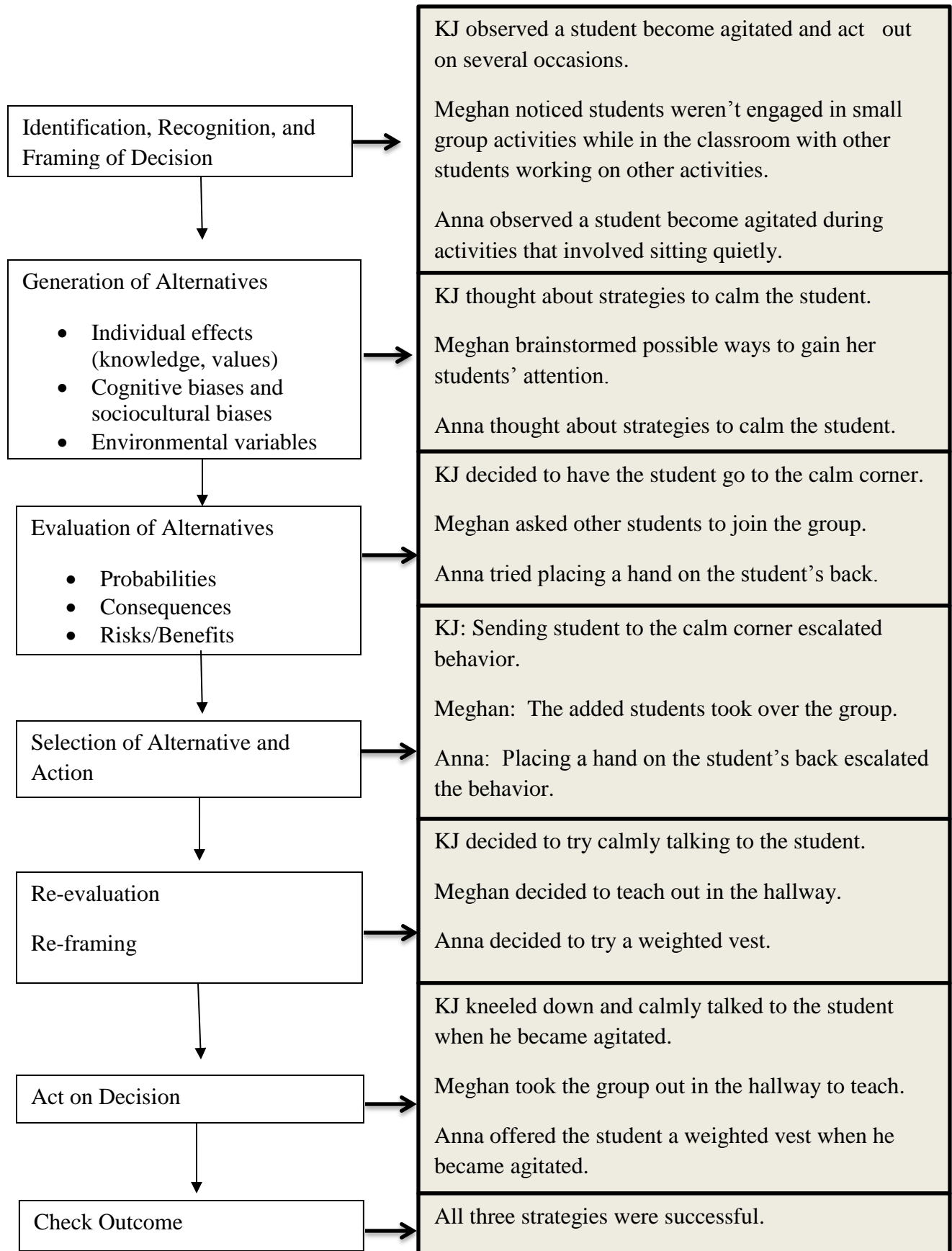


Figure 6: Decision Making Model Level Three

After determining the level of decision making scores for each teacher, I compared the decision making scores to the CLASS scores and created a scatterplot.

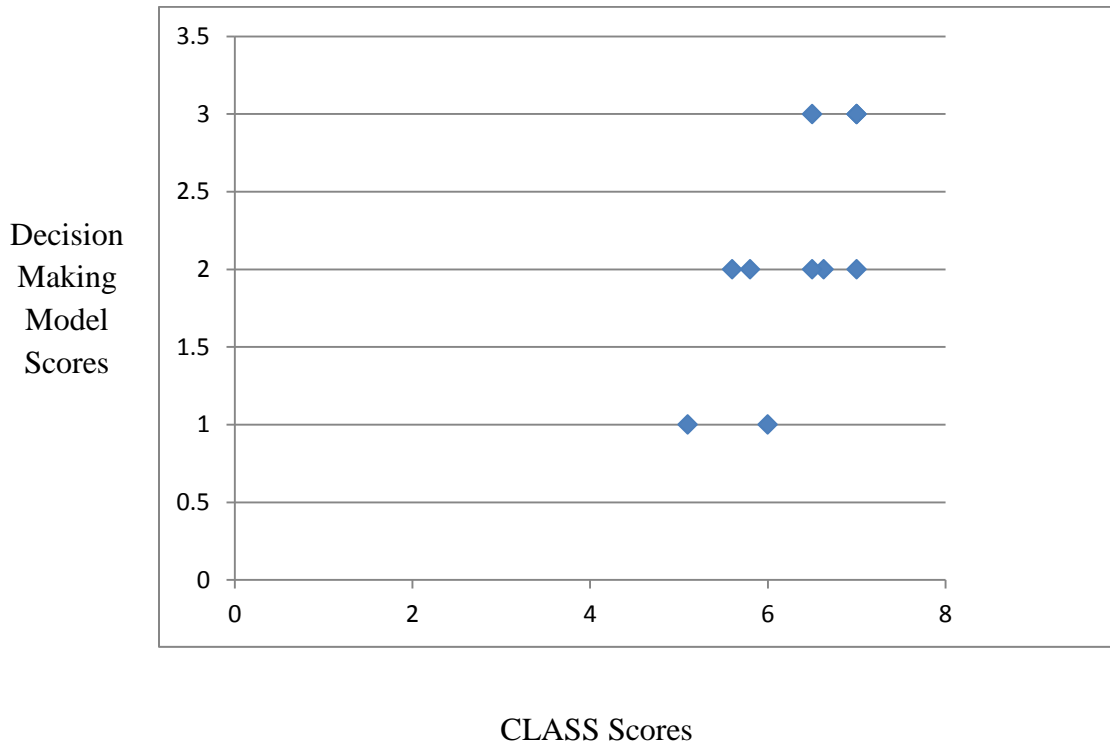


Figure 7: Scatterplot of Teacher's Decision Making Model Scores and CLASS Scores

I then calculated a correlation between the decision making model scores and the CLASS scores. This correlation was 0.71, which is statistically significant, $r(8) = 0.71, p < .05$.

However, it is important to note using the levels of reflection from Halpern's (2009)

Multiprocess Model of Decision Making has not been tested for reliability or validity. However,

for these 10 teachers it indicates that the teachers who completed more stages of decision making tended to obtain higher scores on the CLASS, an assessment of teacher effectiveness. The

decision making model scores also correlated highly to the teachers' years of experience (0.80)

and teacher ages (0.64). Therefore, the same can be said that for these 10 teachers, the more

experience and the higher the age of the teachers, the more stages of decision making were

usually completed. The second research question was: How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching? The analysis of data indicates the more detailed a teacher’s reflection on the decision making process regarding classroom events, the more effective the teacher’s instruction.

References to Critical Thinking and HCTA

When I coded teacher interviews with critical thinking references, I coded the following number of comments that were related to the subcomponents of the HCTA. Table 7 shows the number of coded references for each subcomponent of the HCTA.

Table 7: *Comparison of HCTA to Interview Coded References*

HCTA Critical Thinking Components	Number of Coded References
Verbal Reasoning	0
Argument Analysis Skills	0
Skills in Thinking as Hypothesis Testing	4
Using Likelihood and Uncertainty	0
Decision Making and Problem Solving Skills	33

Of the five subcomponents of the HCTA, the teachers referred only to critical thinking skills that could be coded as “Skills in Thinking as Hypothesis Testing” and “Decision Making and Problem Solving Skills.”

References to Critical Thinking and CLASS

The CLASS assessment divides effective teaching into three areas: emotional support, classroom organization, and instructional support. These three subcategories are further divided into 10 dimensions. I categorized the teachers’ references to critical thinking into the three

subcategories. Then I used the ten dimensions as themes. Table 8 includes the number of teacher references to the CLASS subcategory of classroom organization. This subcategory is further separated into behavior management, productivity, and instructional learning formats. Behavior management is the anticipation and prevention of misbehaviors. Productivity refers to classroom management while instructional learning formats refers to student engagement.

Table 8: *Teacher References to Critical Thinking and CLASS: Classroom Organization*

Seven References from Text	Dimensions
Rebecca: “You always have to think about certain behaviors or things that could happen and how to handle those.”	Behavior Management
Mariah: “Thinking of different strategies is a really good way to say I would use critical thinking, especially the behaviors.”	Behavior Management
Cara: Classroom management, building those relationships, creativity, and just trying to come up with something new and then just being flexible to their needs so if we’re having a meltdown moment and this just isn’t going well, I’ll stop everything we’re doing so you know, let’s just take a breath.	Behavior Management
Rebecca: Once you start the classroom you see how things work, how things don’t work.	Productivity
Mariah: Messy stuff we try to keep over by the sink. So it’s easy for them to go wash their hands. We keep the art table here just because of the counter.	Productivity
Cara: It’s really important. It makes a difference in how the room feels. In this case it works better to have my tables separated out so that way when I do small groups. . . and prep with the speech teachers to figure out: Okay, what are you doing? What am I doing? How can we balance this out? Is it better whole group? Is it better small group?	Productivity
Rebecca: What are they playing with? What are they not playing with? What are they getting from playing with that?	Instructional Learning Formats
KJ: I think about what is going to be interesting to the kids. What they can relate to.	Instructional Learning Formats

Three references to critical thinking were related to behavior management. These references also connect to instructional support since they refer to “thinking of different strategies” (Mariah) and “just trying to come up with something new” (Cara). The final five references were divided between three references connected to productivity and two references connected to instructional learning formats.

Table 9 includes the emotional support subcategory of the CLASS.

Table 9: *Teacher References to Critical Thinking and CLASS: Emotional Support*

Seven References from Text	Dimensions
Meghan: So if they’re acting out or they’re withdrawn those are kinda the students that I really make more of an effort than all the other students just to see what we can do or what I can do to help draw them out.	Teacher Sensitivity
Lila: Once you build that relationship with them, you kinda predict their behaviors almost.	Teacher Sensitivity
Erica: I think by observing them and watching how they’re doing. If they’re getting sad. If they’re kind of reluctant to try something at first.	Teacher Sensitivity
Erica: I think sometimes the social emotional aspect can make it difficult. Sometimes you don’t know especially when children are new and you don’t know how they’re going to react and how they’re going to be when they’re introduced to new things or new people or new scenarios or going to different places so that sometimes it’s hard to predict some of those things when you don’t know the kids. That can kind of make it challenging.	Teacher Sensitivity
Cara: Their demeanor kind of shows it. To know something’s not quite right. I look at them and I can just see it in their eyes. You can see it in their body language. You can hear it in their voice.	Teacher Sensitivity
Cherity: We just know them. We can just tell by their face. Like we get to know them, their facial expressions.	Teacher Sensitivity
Mariah: We just decided when we get to know the kids. Like I said if they’re anxious or they just are really unsure of what’s happening, then we kind of give them that visual to help them tie it in to what we’re going to be doing.	Teacher Sensitivity

Positive climate is the civility of the classroom. Negative climate is the presence of negative teacher remarks and actions. Negative climate is reverse scored so a score of seven indicates no negative comments or actions occurred. Teacher sensitivity is the teacher's response to student cues for support. Finally, regard for student perspectives refers to how teachers incorporate student interests into classroom activities and lessons. All seven references to emotional support connected to teacher sensitivity.

Table 10 connects teacher references to critical thinking and the CLASS subcategory of instructional support. The CLASS subcategory of instructional support refers to how a teacher delivers instruction, not the curriculum itself. There are three dimensions of instructional support, which are concept development, quality feedback, and language modeling. Concept development refers to encouraging higher-order thinking. It is the process of planning for and engaging with students to provide effective teaching. It is important to note that the discussion of lesson objectives is considered to be an instructional learning format under the CLASS subcategory of classroom organization. The lesson objective relates to the overall lesson, while concept development refers more closely to individual learning needs. The teachers discussed what students needed to learn rather than specific lesson objectives. Hence, I included these teacher references under concept development rather than instructional learning formats. Quality of feedback addresses whether feedback invokes further concept development. Finally, language modeling refers to the teacher's use of back-and-forth exchanges, open-ended questions, and self- and parallel-talk to support a student's expressive language (Classroom Assessment Scoring System, 2013).

Table 10: *Teacher References to Critical Thinking and CLASS: Instructional Support*

Thirteen References from Text	Dimensions
Rebecca: I was collecting data and finding out where he was at and completing assessments for him so I could figure out where his holes were for learning.	Concept Development
KJ: How can I help H benefit from circle time? ‘Cause right now I don’t think she does. She has a hard time targeting things.	Concept Development
KJ: What I can do to help a student? That’s my most critical thinking.	Concept Development
Meghan: Try to figure out how to make them modifications within the classroom but then I also look at their individual IEP goals and based on that then I come up with what I think might be motivating things for them to do that work for their goals.	Concept Development
Meghan: We do a lot of observing and that’s how we kind of figure out so by observing the kids where they are, what would be most helpful.	Concept Development
Tosha: Just kinda where they’re at. I know one of them was independently doing his name already and okay so he’s ready whereas the one...not ready for that yet.	Concept Development
Tosha: Figuring out how to help the best can be a struggle but through the help of other teachers, other therapists, we try to come up with the best solutions or keep trying different ideas.	Concept Development
Erica: [instructional support] really guides what I’m going to do for teaching. It is again based on student needs and what we’re working on with them. And how I structure a lesson or activity I plan all going to that instructional support.	Concept Development
Erica: Really thinking through what I want to do with them and what we can do during activities and during play. What really can I work on with them?	Concept Development
Erica: It’s really looking at all different areas and what the students need. And that’s always the forefront of how I plan and pick activities.	Concept Development
Cara: I started a lot around my testing, That’s where I start with instruction. Where are they at and what’s the next step.	Concept Development
Cherity: It’s [instructional support] by observation and really getting to know your kids. Those first two, three weeks of school the kids just do a lot of play and that allows both of us to observe them and figure it out.	Concept Development
Anna: Sometimes I’ll talk with the 4K teacher to see what she would like them to be doing and then maybe depending on what their area of disability is I can modify that way.	Concept Development

Thirteen teacher references to critical thinking referred to instructional support. However, all 13 references specifically connected to concept development. The teachers did not discuss quality feedback and language modeling in relation to critical thinking.

References to Critical Thinking and Effective Instruction

When I asked the teachers how their critical thinking skills benefitted them as a teacher, four themes emerged. The four themes were a) anticipating problems; b) determining strategies; c) collaborating; and d) reflecting on past lessons. Appendix I includes the teacher text references that connect to each theme. Four teachers referenced their use of critical thinking to anticipate and prevent problems. Rebecca included examples of seeing a puddle and knowing students will want to jump in it, as well as, what possible fears students might have about swimming. Cherity stated that anticipating problems could help keep problems from escalating. Overall, the teachers regarded the practice of anticipating and preventing problems as an effective use of critical thinking. Therefore, the teachers felt that anticipating problems helped prevent or de-escalate misbehavior and helped alleviate potential student fears.

Four teachers connected critical thinking with collaboration. The teachers acknowledged that they didn't always have answers and felt that collaborating with their colleagues increased the possibility of finding successful strategies. The teachers, therefore, felt that collaborating increased the effectiveness of critical thinking.

Five teachers discussed the use of critical thinking to plan instructional and behavioral strategies. Three of the teachers discussed that critical thinking for determining strategies started with observing the students. Two teachers referred to the use of brainstorming to come up with strategies and activities. This follows Halpern's (2009) decision making model of identifying a problem, generating alternatives, and selecting an action.

Eight teachers discussed the critical thinking component of reflection. After teaching lessons, the eight teachers spent time reflecting on how they could further improve the lessons next time. They also reflected on student behaviors and learning and how these also could be improved. This continual reflection process of critically thinking about possible lesson improvements connects directly to effective instruction.

The third research question was: How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking? Teachers discuss their use of critical thinking when collaborating with colleagues. In addition, teachers discuss using critical thinking before instruction to anticipate problems and after instruction to improve future lessons. These uses of critical thinking as discussed by the teachers connect well to Halpern's (2009) Multiprocess Model of Decision Making. Therefore, teachers discuss a decision making process in the areas of collaborating, anticipating problems, determining strategies, and analyzing instruction when they discuss critical thinking and effective instruction.

Summary

In this chapter, I gathered data to answer the following questions:

1. How do standardized measures of critical thinking and effective teaching reflect the relationship between these two constructs?
2. How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching?
3. How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking?

I first determined a correlation for the teacher scores from the CLASS and HCTA. The correlation was -0.12, which indicates there is little to no correlation between the two scores. There appeared to be no trends or patterns between the CLASS or HCTA and demographics, also. However, when I compared teacher scores related to Halpern's decision making model, there were strong correlations between the decision model scores and CLASS scores, teacher experiences, and teacher ages. This correlation indicated there may be a positive connection between the decision making scores, CLASS scores, and demographics of these 10 teachers. I then connected teacher discussion of critical thinking to the three subcategories and 10 dimensions of the CLASS. I found the largest number of teacher comments regarding critical thinking related to concept development in the subcategory of instructional support. Finally, I analyzed teacher comments toward critical thinking and effective instruction. Four themes emerged, which were a) anticipating problems; b) determining strategies; c) collaborating with colleagues; and d) reflecting on past lessons. These teacher comments connected well to Halpern's (2009) Multiprocess Model of Decision Making. In Chapter 5, I will synthesize the findings to further examine the relationship between critical thinking and effective teaching for these 10 pre-kindergarten special education teachers.

CHAPTER 5: DISCUSSION

In this chapter I discuss the significance of my findings and I connect my findings to the results of my literature review. I discuss three key findings, which are: a) the HCTA may not be a good measure of teacher critical thinking; b) teacher discussion of critical thinking related most closely to the CLASS subcategory of instructional support; and c) teachers and pre-service teachers need opportunities to develop their knowledge base of instructional strategies. Through the discussion of these three key findings, I answer my overarching question: What is the relationship between critical thinking and effective teaching for pre-kindergarten special education teachers?

HCTA as a Measure of Teacher Critical Thinking

For the eight participants that I observed and who completed the HCTA, the correlation between their scores on the CLASS and the forced choice portion of the HCTA was -0.12. Therefore, there is not a significant relationship between teachers' HCTA and CLASS scores, $r(6) = -0.12, p > .05$.

However, the qualitative data collected in this study indicates there may be a connection between teacher critical thinking and specific subcategories of the HCTA. Based on the teachers' transcripts, the strongest connection between critical thinking and effective instruction is in the areas of decision making, problem solving, and hypothesis testing. The HCTA includes one global critical thinking score rather than scores for each subcategory. Therefore, if teachers only use the subcategories of decision making, problem solving, and hypothesis testing, a global score as assessed by the HCTA will not accurately reflect the critical thinking skills teachers need to effectively teach.

If these are the only connections, this lends credence to the argument that critical thinking skills are specific in nature. One disagreement among theorists in the area of critical thinking is whether critical thinking is a general or specific skill. Halpern (1999) and Paul (1990) are two theorists who believe critical thinking skills are general, easily taught in one course, and then transferred to other domains. McPeck (1990) and Bailin (1998), however, believe critical thinking cannot be effectively taught in isolation.

If both the teachers' CLASS scores and HCTA scores are accurate, this indicates teachers do not need all types of critical thinking skills to teach successfully. My study indicates early childhood special education teachers use their reflective critical thinking skills to make decisions, solve problems, and test hypotheses. They are using two specific critical thinking subskills rather than the entire range of possible critical thinking subskills. Therefore, an assessment that measures decision making, problem solving skills, and hypothesis testing may be more appropriate to assess pre-kindergarten special education teachers' critical thinking than the HCTA.

Critical Thinking and Instructional Support

Of 27 teacher references that related to the CLASS, seven related to teacher sensitivity, two to instructional learning formats, and three each to productivity and behavior management. The largest number of references, 13, related to concept development in the instructional subcategory of the CLASS. Further examination of teacher comments also indicated the dimension of student concept development in the area of instructional support was where teachers were most likely to critically think.

Three teachers indicated they critically thought about classroom organization and management, which is categorized as productivity. The other two areas of the classroom organization subcategory were behavior management (three references) and instructional learning formats (two references). Although categorized as classroom organization, these two dimensions can be connected to instructional support, especially behavior management. The teachers stated they needed to “think about certain behaviors that could happen and how to handle those” (Rebecca), think “of different strategies” (Mariah), and be “flexible to their needs” (Cara). Managing student behavior requires the same decision making process as determining appropriate instructional support. Instructional learning formats also relate to instructional support in that teachers critically think about materials “What are they playing with? What are they not playing with?” (Rebecca) and “What is going to be interesting to the kids?” (KJ). Therefore, five of the seven references to classroom organization also connect to instructional support.

There are four dimensions of emotional support: a) positive climate; b) negative climate; c) teacher sensitivity; and d) regard for student perspectives. All seven teacher references categorized under emotional support related to teacher sensitivity. Overall, teachers stressed the importance of knowing and understanding their students, which is the dimension of teacher sensitivity. Once they knew their students, teachers felt they could “kinda predict their behaviors almost” (Lila), that their “demeanor kind of shows it” (Cara), and that “we can just tell by their face.” (Cherity). These teacher comments indicate that their emphasis on emotional support may be due to a nurturing teaching perspective rather than critical thinking. Pratt (1998) states that the nurturing teaching perspective includes the “practice of ‘intuitive’ understanding of others’

emotional states.” (p.163). The teachers’ comments reflect this intuitive understanding of their students and, hence, a nurturing perspective.

Concept development includes support for student higher-order thinking (CLASS, 2013). For example, Curby et al. (2009) found quality instructional support increased kindergarten literacy skills. There are three reasons why teachers’ use of critical thinking connected most closely to the dimension of concept development in the CLASS subcategory of instructional support. First, the dimension of concept development in the subcategory of instructional support contained 13 references, which was higher than the number of references in the other two categories of classroom organization and emotional support. Second, the teachers’ beliefs in emotional support probably derive from their nurturing teaching perspective rather than critical thinking. Finally, five of the seven references to classroom organization also relate to instructional support. Therefore, pre-kindergarten special education teachers connect their use of critical thinking mainly to instructional support through concept development.

Although the teachers indicated this connection between critical thinking and concept development, two other dimensions of instructional support were not mentioned, which are quality of feedback and language modeling. This lack of consideration of the dimensions of quality of feedback and language modeling is also reflected in the teachers’ CLASS scores. The overall average score in instructional support was 5.9 as compared to 6.2 in classroom organization and 6.8 in emotional support. This data indicates that pre-kindergarten teachers are not considering quality of feedback and language modeling when developing instructional supports.

The main emphasis of the instructional support component of the CLASS is language (Pianta et al., 2008). Therefore, pre-kindergarten teachers must determine each student’s specific

language needs, identify possible strategies to increase their language, and select a strategy to implement. This process requires quick critical thinking to analyze and facilitate communication in the moment. The teachers who included these concepts into their classrooms seemed to do so effortlessly. They embedded talking to students, providing specific feedback, and modeling language seamlessly into the flow of the day. Schön (1983) refers to seamless teaching as reflection-in-action. Reflection-in-action requires a person to use tacit knowledge to react quickly and accurately to a situation without discernable thought (Schön, 1983). The ability of a teacher to include language and concept development effortlessly throughout the school day was the main difference between the higher and lower individual teacher scores on the CLASS. Teachers can pre-plan to develop concepts, provide specific feedback, and model language to a small degree. Most of this support, though, happens serendipitously as the day progresses. Therefore, instructional support requires pre-kindergarten special education teachers to evaluate their student feedback and language modeling, and to consciously use critical thinking skill in the moment to increase effective teaching in the areas of instructional support, emotional support, and classroom organization.

Increasing a Knowledge Base of Instructional Strategies

When I compared teacher discussion of specific teaching events to Halpern's decision making model (2009), I found a positive correlation of 0.71, which is a strong correlation. I also found strong correlations between the teacher's detail of specific events and teacher age (0.64) and years of experience (0.80). These correlations indicate a possible connection between the teacher's discussion of specific events, age, years of experience and effective teaching as indicated by their scores on the CLASS.

The three teachers who discussed multiple decision making cycles were experienced teachers with ages of 43, 43, and 34 and years of experience of 19, 16, and 10, respectively. Alternatively, the two teachers who only discussed a problem without working through the decision making model were novice teachers, ages 24 and 26, with 1.5 and 3 years teaching experience, respectively. This finding is supported by research that indicates that experienced teachers are more likely to identify, acquire data, and analyze solutions to a problem, while novice teachers tend to only identify the problem (Pilvar & Leijen, 2015; Swanson, O'Connor, & Cooney, 1990). This finding of more detailed problem solving in experienced teachers versus novice teachers held even after Swanson et al., (1990) statistically controlled for years of teaching experience. Both Ethell and McMeniman (2000) and Wolff et al., (2014) found that experienced teachers were more likely to connect prior knowledge to current incidences to predict behaviors or misconceptions than novice teachers. In addition, experienced teachers evaluated student learning as well as classroom behavior while novice teachers tended to evaluate only whether students were well behaved and attentive (Hall & Smith, 2006; Wolff, et al., 2014). Finally, Sawyer (2001) found novice teachers concentrate on their own performance, while expert teachers concentrate on student learning. Therefore, research indicates it is typical for experienced teachers to teach more effectively than novice teachers.

All teacher CLASS scores, ages, and years of experience did not hold to the premise of higher age and experience relating to higher CLASS scores. KJ was 34 years old and had 10 years' experience teaching. However, she scored higher on the CLASS and scored a higher level of decision making on the Halpern model than three teachers who were 10 to 12 years older than she. When rereading the transcripts of the six teachers who were KJ's age or older, KJ was the only teacher who referenced her commitment to ongoing professional development. KJ stated:

“I took a class last year and they said, when you pick your lessons, pick them to relate to your experiences because then kids can relate better. You can have conversations better when they can relate to certain things,” and “I try to do [take courses] one a year.” KJ’s commitment to ongoing professional development connects to the disposition toward critical thinking.

The Delphi panel convened by the American Philosophical Association (Facione, 1990) to identify key components of critical thinking included the characteristics of “habitually inquisitive” and “well-informed.” While some theorists such as Dewey (1997), Paul (1990), McPeck (1990), and Halpern (1999) agree that a definition of critical thinking should include dispositions as well as skills, other theorists, such as Ennis (1996), believe the two constructs are separate. Since KJ is only one example, further research is needed to determine if both critical thinking skills and dispositions are needed for pre-kindergarten special education teachers to acquire knowledge bases.

Instructional efficacy, or fluency, is teaching in a manner that achieves the maximum student achievement in the minimum amount of time (Konrad, Helf, & Joseph, 2011). By becoming instructionally fluent, the teacher increases the amount of time available for additional instruction. One way to increase instructional fluency is for the teacher to become adept at selecting appropriate instructional strategies for specific students. This ability comes from understanding which strategies work well for which students through reflective decision making. Teacher who merely use the first level of decision making tend to only react to circumstances. Bayat (2010) refers to this first level of decision making as non-productive reflection; it mainly describes events without supportive analysis. If a teacher instead reflects upon the circumstance and the success or his or her response, the teacher more likely increases his or her repertoire of strategies to rely on the next time the circumstance occurs. This productive reflection includes

evaluating events, raising questions, and revising goals (King & Kitchener, 1994; Jay & Johnson, 2002; Oner & Adadan, 2011; Hatton & Smith, 1995). The ability to reflect and draw upon this repertoire of strategies in-the-moment allows the teacher to continually refine instruction to efficiently meet the individual needs of students and, therefore, additionally increase instructional fluency. This line of reasoning requires further research to determine the importance of increasing a teacher's abilities to reflect on all levels of decision making and to make efficient decisions in-the-moment as means to increase teacher effectiveness. Therefore, it is important for pre-kindergarten special education teachers to achieve instructional fluency in order to provide effective instruction. One means to achieve instructional fluency is to acquire a knowledge base of behavioral and instructional strategies. This knowledge base can be acquired through experience, collaboration, and critical thinking dispositions toward seeking out new knowledge.

Therefore, although there may be a connection between age, years of experience, and CLASS scores, the connection may also connect to a combination of critical thinking skills and dispositions. Years of experience allow the teachers to gain the knowledge base to become more effective teachers; however, teachers may also need the disposition of continually seeking to develop their knowledge base, such as KJ does. Therefore, pre-kindergarten special education teachers need to use critical thinking dispositions to continually seek to increase their knowledge base of behavioral and instructional strategies.

Limitations

The limitations of this study arise from the mixed methods multi-case study design. Since I only interviewed 10 teachers, the benefit of my study is to add the perspectives of 10 pre-

kindergarten special education teachers to the research on critical thinking and effective instruction, rather than to generalize to other populations. This lack of generalizability is especially limited since all 10 of the participants were female and Caucasian. In addition, all 10 teachers earned CLASS scores in the average or above average categories. This indicates they are all effective teachers. This makes sense, since ineffective teachers were probably less likely to volunteer for observation. I suggest that future research include more diversity in its participant sample, both in demographics and teaching abilities.

Conclusion

The purpose of this study is to better understand how pre-kindergarten special education teachers' critical thinking skills connect with their teaching effectiveness. To accomplish this purpose, I sought to answer the following questions:

1. How do standardized measures of critical thinking and effective teaching reflect the relationship between these two constructs?
2. How do specific teaching events that reflect critical thinking clarify the relationship between critical thinking and effective teaching?
3. How do early childhood special education teachers talk about their effective teaching skills in relation to the importance of critical thinking?

Through a search of literature, I identified the following propositions to guide my study:

- Critical thinking includes verbal reasoning skills, argument analysis skills, hypothesis testing using likelihood and uncertainty, and decision making and problem-solving skills (Halpern, 2010a).

- Three areas of classroom climate linked with teaching effectiveness of a young child's learning are emotional support, classroom organization, and instructional support (Brock & Curby, 2014).
- There is a correlation between the quality of a teacher's selected teaching strategies and critical thinking (Akkaya, 2012; Birjandi & Bagherkazmi, 2010; Yang (2012).

From the analysis of all the data, I identified three key findings that connect to the literature based propositions I used to guide the direction of this study. The following three key findings contribute to the current knowledge of the connection between critical thinking and effective teaching of pre-kindergarten special education teachers:

- The HCTA may not be a good measure of teacher critical thinking.
- Teacher discussion of critical thinking related most closely to the CLASS dimension of concept development in the subcategory of instructional support.
- Teachers and pre-service teachers need opportunities to develop their knowledge base of behavioral and instructional strategies.

The HCTA consists of five subcategories, which are a) verbal reasoning skills, b) argument analysis skills, c) hypothesis testing, d) using likelihood and uncertainty, and e) decision making and problem-solving (Halpern, 2010a). However, the teachers' discussion of critical thinking connected only to the subcategories of hypothesis testing and decision making and problem solving. Therefore, the HCTA is not a good standardized assessment tool for determining the critical thinking skills of pre-kindergarten special education teachers. A standardized assessment that measures decision making and problem solving would better measure the critical thinking skills pre-kindergarten special education teachers use to teach effectively.

The three areas of instruction that support effective pre-kindergarten teaching are emotional support, classroom organization, and instructional support (Brock & Curby, 2014). Of these three areas, pre-kindergarten special education teachers connect critical thinking most closely to the instructional support of concept development. The teachers become effective teachers by acquiring a knowledge base of instructional and behavioral strategies to rely on for effective and efficient teaching. However, the teachers did not connect critical thinking to the areas of quality feedback and language modeling. To improve effective teaching, pre-kindergarten special education teachers need to practice pre-planning and in-the-moment critical thinking to improve the quality of feedback and language modeling to improve their effective teaching.

There is a correlation between the quality of a teacher's selected teaching strategies and critical thinking (Akkaya, 2012; Birjandi & Bagherkazmi, 2010; Yang, 2012). My study found a possible connection between decision making regarding teaching and effective teaching. This finding supports the research of Akkaya (2010), Birjandi and Bagherkazmi (2010), and Yang (2012). It is important for teachers to use critical thinking to increase their knowledge base of teaching strategies, especially regarding student behavior and instruction. Pre-kindergarten special education teachers should seek to consciously develop a strong knowledge base of behavioral and instructional strategies to improve their effective teaching.

This study contributed to research regarding the critical thinking and effective teaching of pre-kindergarten special education teachers in the areas of: a) standardized assessment of critical thinking skills of pre-kindergarten special education teachers; b) the connection between critical thinking and effective teaching as measured by the CLASS; and c) the acquisition of behavioral

and instructional strategies. However, more research is needed in all three areas to further contribute to the findings of this study as discussed below.

A standardized assessment of decision making and problem solving skills would more accurately measure the critical thinking skills of pre-kindergarten special education teachers rather than a global measure of critical thinking such as the HCTA. Although not statistically relevant, this study indicated there was no connection between the ten pre-kindergarten special education teachers' scores on the HCTA and CLASS; however, there was a connection between the teachers' scores on the CLASS and the level of decision making they discussed based on Halpern's (2009) Multiprocess Model of Decision Making. Although Halpern's decision making model is not standardized, it is useful to informally assess pre-kindergarten special education teachers' critical decision making skills. Based on the informal assessment results found in this study using Halpern's decision making model, further research is needed to determine if a standardized measure of decision making and problem solving would identify a connection between pre-kindergarten special education teachers' critical thinking skills and effective teaching as measured by the CLASS. If a correlation can be identified between teacher critical thinking and effective teaching, the identified standardized assessments could be used to better understand this connection.

Pre-kindergarten special education teachers should critically think about the dimensions of quality feedback and language modeling. This study identified the CLASS subcategory of instructional support as the overall lowest scores for the teachers in this study. This study also identified a connection between teachers' discussion of critical thinking and the concept development dimension of the CLASS instructional support subcategory. It also indicated that the teachers did not discuss critical thinking in connection to providing quality feedback and

language modeling. Further research is needed to determine how pre-kindergarten special education teachers can use pre-planning and in-the-moment decision making to include quality feedback and language modeling while teaching. If teachers learn how to provide these two dimensions, especially in-the-moment while teaching, the effectiveness of their teaching will increase.

Finally, pre-kindergarten special education teachers should actively seek to increase their knowledge base of behavioral and instructional strategies. This study indicates a connection between teacher discussion of considering multiple strategies to solve problems and effective instruction. Further research is needed to determine how teachers acquire a larger knowledge base of strategies. In addition, further research is needed to determine if following a reflection process using Halpern's model of decision making increases better selection of strategies, which in turn supports efficient and effective teaching. With further research in these two areas, pre-kindergarten special education teachers would know how to best acquire a knowledge base from which to select the most successful strategies to effectively teach students.

In conclusion, by conducting this study, I sought to further understand the connection between the critical thinking and effective instruction of pre-kindergarten special education teachers. I found that the 10 pre-kindergarten special education teachers who participated in this study used their decision-making, hypothesis-testing, and problem solving-skills to critically think about how to best provide instructional support for their students, especially in the area of concept development. The more conscious they were of how they used decision making to select multiple strategies, the more effective their teaching. Pre-kindergarten special education teachers can increase their teaching effectiveness by striving to continually increase their knowledge base of strategies. Therefore, pre-kindergarten special education teachers should use

decision-making, hypothesis-testing and problem-solving skills to critically think about the effectiveness of their teaching in regard to classroom organization, emotional support, and instructional support.

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APPENDIX A:

Demographic Information

Age _____

Level of Education

_____ Bachelor's of Arts or Science

_____ Master's Degree

_____ Master's Degree plus additional credits

_____ PhD

Path to Teaching License:

_____ Traditional Bachelor's degree program

_____ Program for students who already hold a Bachelor's degree
(Post-Baccalaureate program)

_____ Non-traditional alternative program through CESA or other DPI approved program

Years of Teaching In Each of the Following Environments:

_____ Rural or small town (population less than 20,000)

_____ Midsize town (population 20,000 to 50,000)

_____ Small city (population 51,000 to 150,000)

_____ Large and/or urban city (population above 150,000)

Total Number of Years Teaching _____

APPENDIX B:

Example of Halpern Critical Thinking Assessment

Forced Response

Sample Item--Part 2

After a televised debate on capital punishment, viewers were encouraged to log on to the station's web site and vote online to indicate if they were "for" or "opposed to" capital punishment. Within the first hour, almost 1000 people "voted" at the website, with close to half voting for each position. The news anchor for this station announced the results the next day. He concluded that the people in this state were evenly divided on the issue of capital punishment.

Given this information, consider each of the following alternatives and decide if it is true or probably true. Type the letter (T) next to all of the alternatives that are true or probably true. Leave the other alternatives blank.

- () Many people went to their computer to "vote" soon after the show ended.
- () About half of all women and half of all men favor capital punishment.
- () The pro side and the con side of the debate were equally convincing
- () People who watched this show and then voted on their computer may be representative of all of the people in this state.
- () People who voted probably have stronger feelings about this topic (positive or negative) than those who did not vote.

APPENDIX C:

Example of Teacher Sensitivity Descriptor from the Classroom Assessment Scoring System

(CLASS)

(Pianta, La Paro, and Hamre, 2008, p. 32)

AWARENESS	Low (1,2)	Mid (3,4,5)	High (6,7)
<p>Anticipates problems and plans appropriately</p> <p>Notices lack of understanding and/or difficulties</p>	<p>The teacher consistently fails to be aware of students who need extra support, assistance, or attention.</p>	<p>The teacher is sometimes aware of students who need extra support, assistance, or attention.</p>	<p>The teacher is consistently aware of students who need extra support, assistance, or attention.</p>
RESPONSIVENESS			
<p>Acknowledges emotions</p> <p>Provides comfort and assistance</p> <p>Provides individualized support</p>	<p>The teacher is unresponsive to or dismissive of students and provides the same level of assistance to all students, regardless of their individual needs.</p>	<p>The teacher is responsive to student sometimes but at other times is more dismissive or unresponsive, matching his or her support to the needs and abilities of some students but not others.</p>	<p>The teacher is consistently responsive to students and matches his or her support to their needs and abilities.</p>
ADDRESSES PROBLEMS			
<p>Helps in an effective and timely manner.</p> <p>Helps resolve problems</p>	<p>The teacher is ineffective at addressing students' problems and concerns.</p>	<p>The teacher is sometimes effective at addressing students' problems and concerns.</p>	<p>The teacher is consistently effective at addressing students' problems and concerns.</p>

**STUDENT
COMFORT**

Seeks support and
guidance

Freely participates

Takes risks

The students rarely
seek support, share
their ideas with, or
respond to questions
from the teacher.

The students
sometimes seek
support from, share
their ideas with, or
respond to questions
from the teachers.

The students appear
comfortable seeking
support from,
sharing their ideas
with, and
responding freely to
the teacher.

APPENDIX D:

Interview Questions

1. Tell me how you decided to _____? What did you see the students doing?
(Example: Tell me how you decided to stop and reteach the lesson.)
2. What were you thinking about when you _____?
(Example: What were you thinking about when you changed the seating arrangement?)
3. Could you describe the events that made you decide to _____?
(Example: Could you describe the events that made you decide to stop the lesson early?)
4. How do you decide what to teach? What do you think about?
5. How is emotional support of students important to effective teaching? How do you decide when students need emotional support?
6. How is the organization of the classroom important to effective teaching? How did you decide to organize your classroom?
7. How is instructional support important to effective teaching? How do you decide what instructional supports to use?
8. What do you think are the most important characteristics of an effective teacher?
9. What are your strengths as a teacher?
10. What skills are more difficult and don't come as easily?
11. How do your critical thinking skills benefit you as a teacher? Please provide examples.
12. How did you learn the knowledge and skills to be an effective teacher?
13. When did you feel confident you were an effective teacher?

14. Is there something else you have thought about or want to add?

15. Is there something else you think I should know to understand how you make decisions?

16. Is there something you would like to ask me?

APPENDIX E:

Initial Codes

DECISIONS (Dec)

Teaching Strategies	Dec-TS
Teaching Methods	Dec-TM
Before Teaching Lesson	Dec-BL
After Teaching Lesson	Dec-AL

CLASSROOM (CL)

Emotional Support	CL-ES
Classroom Organization	CL-CO
Instructional Support	CL-IS

CRITICAL THINKING (CT)

Verbal Reasoning	CT-VR
Argument analysis	CT-AA
Hypothesis Testing	CT-HT
Likelihood and Uncertainty	CT-LU
Decision Making	CT-DM
Problem Solving	CT-PS

PRIOR KNOWLEDGE (PK)

College Courses	PK-CC
Student Teaching	PK-ST
Beginning Teacher	PK-BT
Experienced Teacher	PK-ET
Perceived Strengths	PK-PS
Perceived Difficulties	PK-PD

APPENDIX F:

Final Codes (added codes are italicized)

DECISIONS (Dec)

	Dec-TS
Teaching Strategies	Dec-TM
Teaching Methods	Dec-BL
Before Teaching Lesson	Dec-AL
After Teaching Lesson	<i>Dec-DL</i>
<i>During Teaching Lesson</i>	

CLASSROOM (CL)

Emotional Support	CL-ES
Classroom Organization	CL-CO
Instructional Support	CL-IS

CRITICAL THINKING (CT)

Verbal Reasoning	CT-VR
Argument analysis	CT-AA
Hypothesis Testing	CT-HT
Likelihood and Uncertainty	CT-LU
Decision Making	CT-DM
Problem Solving	CT-PS

PRIOR KNOWLEDGE (PK)

College Courses	PK-CC
Student Teaching	PK-ST
Beginning Teacher	PK-BT
Experienced Teacher	PK-ET
Perceived Strengths	PK-PS
Perceived Difficulties	PK-PD

EFFECTIVE TEACHING (ET)

<i>Observation</i>	<i>ET-O</i>
<i>Prior Experience</i>	<i>ET-PE</i>

<i>Working with Other Teachers</i>	<i>ET-WOT</i>
<i>Flexibility</i>	<i>ET-F</i>
<i>SCHÖN</i>	
<i>Knowing-in-Action</i>	<i>S-KIA</i>
<i>Reflecting-in-Action</i>	<i>S-RIA</i>
<i>Reflecting-on-Action</i>	<i>S-ROA</i>
<i>INDIVIDUALIZED EDUCATIONAL PROGRAM</i>	<i>IEP</i>
<i>PROFESSIONAL LEARNING COMMUNITY</i>	<i>PLC</i>
<i>SELF-EFFICACY</i>	<i>SE</i>

APPENDIX G:

Teacher Informed Consent

UNIVERSITY OF WISCONSIN – MILWAUKEE

CONSENT TO PARTICIPATE IN RESEARCH

Consent form for: Early Childhood Special Education Pre-Kindergarten Teachers

1. General Information

Study Title:

Person in Charge of Study (Principal Investigator)

My name is Nancy Sim. I am conducting research to complete my PhD in Urban Education – Exceptional Education at the University of Wisconsin in Milwaukee. I am also an Associate Professor of Education at Silver Lake College, Manitowoc, Wisconsin.

2. Study Description

You are being asked to participate in a research study. Your participation is completely voluntary. You don't have to participate if you don't want to. In addition, if you initially agree to participate, you can change your mind and quit at any time.

Study Description:

The purpose of this research study is to explore the connection between a teacher's critical thinking skills and his or her ability to teach effectively.

3. Study Procedures

What will you be asked to do if you participate in the study?

If you agree to participate, you will be asked to:

- Complete the Halpern Critical Thinking Test on a computer. This will take approximately 30 minutes.
- Allow me to observe you teaching one morning or afternoon and complete the CLASS observation tool.
- Allow me to interview you in regard to how you make critical thinking decisions while teaching.

4. Risks and Minimizing Risks

What risks will you face by participating in this study?

The potential risks are minimal. You shouldn't feel anymore discomfort than taking a test or discussing your teaching practices with a colleague. Your name will be removed from all data that is collected. None of the data I collect will be shared with your principal or other district employees

5. Benefits

Will you receive any benefit from participation in this study?

You may benefit from the self-reflection you will experience while answering the interview questions. You will also receive a modest compensation of a restaurant gift card.

6. Study Costs and Compensation

Will you be charged to participate in this study?

No.

Will you be given anything for being in the study?

You will receive a \$30.00 restaurant gift card for completing the research project.

APPENDIX H:

Individual Case Studies

KJ

Description

When I observed KJ teach, it was apparent she planned well for the day's instruction. The room was inviting with separate areas of learning divided by tables or short walls. KJ organized each area with an evident theme. The pet center included stuffed animals, animal carriers, food, and blankets. However, what was most impressive was KJ's use of language with her students. Since the day's lessons were already planned and well prepared, she spent the morning playing and conversing with her students:

KJ: Is someone [the stuffed animal] napping?

Zach: Napping

KJ: Who else might be napping? Choose one more animal – the cat, dog, mmmm(ouse).

Where is that mouse? I bet if you look over there. [Child finds mouse]

KJ: Put them to bed with the blanket [Bell rings.]

KJ: Clean up, clean up. Where do the animals go?

As she is talking with Zach, KJ asked other children questions such as “What color is the horse?” and “What does the dog say?”

Doubting ability. Although KJ scored the highest possible score on the CLASS, she doubted her abilities: “Somedays are – Why am I doing this? Am I good? Should I be here?” She relied on others for affirmation: “I have a lot of parent requests and just a lot of compliments and notes and emails just from parents. That really helps your self-esteem. I’m doing something

right. I'm trying." Although KJ commented on the positive support she received from her colleagues and parents, she also indicated that she worried if she was meeting all the students' needs all of the time. "I'm really trying hard not to worry so much because if something happens that's outside my control, then I change it or I try to figure it out. Yet she also permitted herself not always to accomplish everything: "I know there's so many things you want to do or try, but there's just not enough time in the day. I think I meet the needs of my students."

Building connections with students. One example of KJ's use of critical thinking related to planning lessons, such as her current pet unit, was her emphasis on building connections with her students: "You can have conversations better when they can relate to certain things. If they have a dog and I have a dog, then we can talk more about that."

Being flexible. KJ believed flexibility was a crucial skill for pre-kindergarten teachers – a skill that she stated she practiced every day. "You have to change things all the time . . . Like today, I'm doing something new with patterns. I don't know if it's going to work. I might have to change it up right in the middle. I'm not sure" and "sometimes when I'm up front when I'm doing a lesson and there is a book that has too many words or they're just not with me, OK, we're going to stop the book and just try something else. We're going to talk about it or we're going to paraphrase it. If they're having behavioral issues that day, we're going to do music."

Giving hugs. KJ tried to balance expectations with emotional support. "I'm not a pushover exactly. I'm kind of just more that mellow, easy going. If you need a hug today, I'm going to give you a hug, but now you have to do your work. Just giving them what they need but pushing them to that expectation."

Brainstorming with others. KJ believed her most important critical thinking skill was problem solving to support her students' needs. Much of this critical thinking took place with

other professionals. "We struggle especially in the afternoon with behaviors. My EA (Educational Assistant) and I were really trying to think about what we could do to help these kids who are visual learners. . . We printed out some different pictures. . . We can just show them this picture."

Not only was brainstorming crucial within the classroom, but with educational professionals throughout the school district: "And we have IEPs and we have to place certain kids. I mean, thinking about where they're going to go and how we can best meet their needs. It's really a process. 'This classroom would be good because of this but not because of this'. . . That's a big piece of the job."

KJ believed both types of collaboration were imperative: "Yes, this is my classroom. Yes, ultimately it's my decision. But I really, especially in this early childhood position, when you do work with others, it's huge. It's so huge . . . that team critical thinking."

Dealing with behaviors. KJ had her classroom well organized and well planned. Therefore she spent her time not reacting to behaviors but supporting student language. If behavior issues occurred, her comments gave the appearance of being confident in her reactions: "So if we're singing a song and I'm trying to sing and then I'm having to remind them [to participate], I'll try to put it in there in a way that's not disruptive or distracting. Or I'll use my visual cues. It just depends on the group and what they're doing."

Analysis

Specific teaching event. A significant event in KJ's room was the ongoing behavioral issues of one of her students. Although the day I observed his behavior remained fairly calm, she shared that on certain days he struggled maintaining control of his behaviors. She had tried

different strategies and believed she had found the emotional supports the student needed to self-regulate.

Well, I have [student's name] since the beginning of the school year and we've tried lots of different things with [student's name] and what helped him the most is that direct attention. It just takes a second to redirect him, he kinda just knows. We have him in the cool out corner before. That just makes it worse. He's had some major melt downs. And to get him out of it, all it took was for me to go to him, look at him and talk him through it. . . That's what works for him (KJ).

KJ's response to the student's emotional struggles demonstrates her problem solving, decision making and hypothesis testing skills. KJ identified the problem, chose a strategy, implemented the strategy to test her hypothesis. When the strategy failed, she chose a new strategy to implement. Finally, she found a strategy to help this specific student.

Overall analysis. KJ discussed examples of Schön's (1983) reflection-in-action. She talked about an activity with patterns that she ended early, strategies she used when books were not engaging, and a switch to music when behaviors started to erupt. She also talked about the iterative component of critical thinking and reflection: "I feel you do learn through observation and experiences how to use that critical thinking overall. You thinking about what you could do better." Even though KJ sometimes doubted her abilities, she appeared to have acquired the factors that help develop high self-esteem. She got positive verbal persuasion from her colleagues and parents. She also used master experiences to gain knowledge regarding teaching: "Lots of observations. Lots of trial and error. Just having that basic knowledge of what you need to do." The verbal persuasion, master experiences and effective teaching help develop high

self-efficacy for many teachers. Having these qualities indicated her self-efficacy might be higher than she openly acknowledged.

Interpretation

Critical thinking and effective teaching. KJ is a very effective teacher. She organized and planned well so the day was spent interacting with her students. She appeared to use a reflective form of critical thinking. She continually questioned herself to the point that she tended to worry. Her style of critical thinking appeared to connect well to Schön's (1983) theory of reflection-in-action. She planned her lessons but easily changed them as needed while teaching.

Critical thinking, classroom organization, emotional, and instructional support. KJ's classroom was well organized. As stated earlier, all plans and materials were available before the day started. This pre-planning gave her time to meet the instructional and emotional needs of her students. She believed meeting all the students' individual needs was the most crucial critical thinking task. She also discussed giving emotional support as needed but at the same time, encouraging independence. KJ excelled in all three areas of the CLASS assessment.

Perceived critical thinking skills of pre-kindergarten special education teachers. KJ stated her critical thinking happened at the end of the day and on weekends. She reflected on both what happened during the past week and how she would plan for the next week. In addition she talked about brainstorming with her colleagues. KJ appeared to have a reflective style of critical thinking. Of the critical thinking categories of the HCTA, reflection aligns with decision making and problem-solving.

Rebecca

Description

Rebecca's room was the smallest of the observed classrooms, but still well organized and tidy. Although small, there was space designated for different activities. The day started with free time as the students arrived. Most students were engaged in the different centers. One student, Ethan, was reading a book about space and copying words from the book such as "astronaut" and "oxygen."

When all the students had arrived, they convened at the circle time rug. They sang a song greeting each student and asking how each student was feeling. Ethan had a chance to read the words he had written from the book and talked about astronauts. Later, an audio of a Dr. Seuss book, *Wacky Wednesday*, played while the teacher held up the book and turned the pages. Then the students tried to guess what was wrong in each picture. Rebecca clearly stated expectations and used positive reinforcement as a chance to review expectations throughout the morning:

"I am looking for friends who have eyes on me, safe bodies."

"Check your spot to make sure you are responsible."

I really like how careful you are and looking with your eyes."

Next, in a science experiment, Rebecca sprinkled Skittles candy on a plate of milk. Rebecca introduced the word "dissolving" and tied it to the science lesson, "It means the Skittles are melting." The students were asked to predict what was going to happen. During free time play they looked at what was happening on the plate. After free time, the students discovered the Skittles had melted and made a rainbow-like design. After snack and outside play, the morning ended and the students left for home.

Encouraging emotional growth. Rebecca's interactions and support of Ethan, the pre-kindergarten student who currently scores at the 4th grade level in reading and math on a

standardized assessment, exemplified her effective teaching. Rebecca included instructional support for Ethan by having books and materials at his reading and interest levels available. She organized her classroom so Ethan had an area of the classroom that stored his above grade level books and activities. Although she arranged accommodations to the pre-kindergarten lessons to meet his intellectual needs, she spent more time encouraging his emotional growth, which was typical for a pre-kindergartener:

His [student's name] struggle was playing with other kids. So what he chose to do . . . [was] do research on the computers. Go to the books and do that. Different things. So we kind of compromise and I say "what's really important is you learning how to get along with other kids and playing with other kids and building those friendships."

Although Rebecca made sure his academic needs were met, she was more concerned with his social and emotional needs.

Respecting everybody. Rebecca talked extensively about helping students get along with each other: "Every simple argument or conflict in here is a chance to teach them what to do and how to handle it. How to have respect for everybody. You don't have to like everybody but you do have to be kind to everybody. I think it's crucial in every classroom and very important for the four-year-olds because it is their first time in school."

She brought two girls over when they argued in the science center, encouraged a student with low social skills to interact with other students and allowed one student who had a stressful week to stay by her side. She talked about one student in her afternoon group who became agitated when it was nearing time to leave:

I know there's a kid at 1:45 every day that from 1:45 to 2:30 he's going

to destroy the room because it's getting close to time to go home. I know it's coming so having something there for him in place to take away from that. 'Cause I could try the "knock it off, stop it" but it's only going to escalate it. But I say in my mind, it's 1:45, "Let's sit down and read a story" or let me tell him something really good about what he's doing and avoid it.

Rebecca problem solves and try to find strategies to meet the needs of individual students.

Walking through puddles. Rebecca believed critical thinking as a teacher was the practice of continually assessing and reacting to situations:

Always thinking about every part of the day. Like what I need to prep them for. Like if we're walking to the bus and I see a puddle. What's the first thing kids do when they see a puddle? Walk through the puddle. What do you not want them to do? Walk through the puddle. You're always thinking, What do I need as a four-year-old? What do I say? Then part of me thinks, they're four. Let them run through the puddle. But they really can't.

Rebecca used critical thinking and problem solving to continually scan the environment, search for potential problems and avert issues before they began.

Building together. Rebecca was also continually scanning the students as they played to determine if they were engaging with the toys in a way that increased their learning:

Some of the kids don't know what to do with some of the toys. So even just sitting down and playing with them and showing them the different things that they can do. I have a Marble Works there. And so my task it to look and (ask) What are they playing with? What are they not? What are they getting from

playing with that? What do I want them to learn? So part of that is building together. . . ., I'm going to sit down there and start playing and talk while I'm playing and say while I'm playing, "I wonder if it's going to work? If I drop the marble down here is it going to work? Oh, no, the marble got stuck. Why did the marble get stuck?" Things like that so they get thinking. Now I see them pulling those [Marble Works] and doing that and working with each other.

By constantly scanning the classroom and critically thinking, Rebecca found opportunities to enhance student learning.

Analysis

Specific teaching event. My observation of Rebecca's class began with two girls squabbling over materials in the science center. Rebecca called them over and talked to each for a minute and the two girls calmed down and went to different centers. When I asked Rebecca why she called the students over, she stated:

I heard them arguing. There's been a lot of arguing in the classroom amongst the girls. And we talked about it and we said when that happens we need to talk about it. And therefore I called them over just to kinda get them away from the situation they were in and change their focus and then just talk to them about what we say to each other and just being friends with each other.

And about playing with each other. That's what I thought and removing them from that situation too would give them time to debrief and change their mind sets (Rebecca).

By talking to the two girls, Rebecca enforced the decision she made previously to talk to her students about friendship when they argued. She also thought about this specific situation

and decided that removing them from the science center and allowing them to move to separate centers would help them process the event. Therefore, she used her prior knowledge and decisions to determine her current actions.

Overall analysis. Rebecca had a well-organized room, engaging lessons and clear expectations for her students. These expectations were in place so students could play cooperatively and learn from each other as well as from Rebecca. She achieved this mainly by continually scanning the environment and anticipating the behavior of her students.

Self-efficacy research indicates teachers tend to teach subjects they don't like less than other subjects. One such subject is science (Mintzes et al., 2013). Rebecca was cognizant of her dislike of science and worked toward overcoming it: "When I was in school I did not like science. I did not like any of that. But I wanted to get better at that so I could give kids that [science exploration]."

Rebecca also pointed to master experiences, also related to self-efficacy, as her means of becoming an effective teacher: "Time and experience really have been the best thing for me. Boy, you really have to experience it. You have to live it. You have to do it and see what works and doesn't work."

Rebecca used reflection to determine if she taught her lessons successfully. She watched students as they played and determined how to increase their engagement and learning: "And everything we do I think, What are they going to learn from this? What are they going to do? And are they going to be excited about this?" Her reflection connected to Schön's (1983) reflection-in-action. She anticipated behavior before it happened, whether it was an inviting puddle or a student who did not want to go home.

Interpretation

Critical thinking and effective teaching. Rebecca has what Kounin refers to as withitness (1970). She constantly scanned her classroom and moved to where she believed she was needed. This constant scanning also related to reflection, such as Schön's reflection-in-action.

Critical thinking, classroom organization, emotional, and instructional support. Although Rebecca was strong in all areas of the CLASS, she scored highest in the area of emotional support. It was apparent she believed her leading role as a pre-kindergarten special education teacher was to develop the social-emotional skills of her students.

Perceived critical thinking skills of pre-kindergarten special education teachers. Rebecca stated she was continuously scanning the classroom trying to add student support as needed and anticipating any problems that might occur. This scanning was an example of Schön's reflection-in-action. Also, Rebecca's reflection regarding student mental health demonstrated a high level of reflection due to the subject's connection to a societal issue (Hatton & Smith, 1995; King & Kitchener, 1994). As she stated in the interview, "... you always feel like you've got to do more. You have to have more in place for these kids. We have to do something about this mental health. We have to have something here for these kids and you always second guess that . . . what you should be doing if something's not working" Rebecca's critical thinking connected closely with the decision making and problem-solving components of the HCTA.

Lila

Description

Lila's room was large and colorful. Bookcases, tables, and rugs identified the activity areas. When I arrived, students were selecting from a variety of activities. On a table, puzzles were set up for some of the children to complete. Some involved shape matching while others involved counting and numeral recognition. Lila differentiated by holding up a numeral “2” and a numeral “5” to have the student select the “2” more easily than searching through all ten numerals. One child used a walker. Lila organized the room so she could easily navigate and, with help, used the same chairs and sat on the carpet in the same manner as the rest of the children.

A bell rang, the students picked up the activities and headed to the circle area. Each child had to say "My name is _____" as part of a greeting. Lila stressed language throughout the morning. Students were prompted to ask for help, "What can you say?" and Lila modeled language as needed "Say my puzzle fell on the floor."

Knowing your students. Lila stated that during the first three months she worked on making the students feel safe and secure: "Their emotional happiness is my first concern because if they're not feeling secure, they're not going to learn in here." She first encouraged them to console themselves, but gave hugs and comforting words as needed. She knew when to step in because, as she said, "You can just tell from their faces." She later stated the most effective characteristic of a teacher was “knowing your students. That leads to understanding them. Once you build that relationship with them you can kind of predict their behaviors almost." Lila’s first concern was her students’ social and emotional health. She believed the students must first feel safe and secure before learning could begin.

Knowing “on the spot”. During circle time one girl refused to cooperate. Lila questioned how she should have handled the situation and said, “So now I’m going to go back and think about that. It’s also behavior management but to get her to want to do it the first time. I’m going to have to think about that now. That will help me be a better teacher just to know on the spot what to do in the situation like that when it comes up.” Yet she believed she critically thought less now that she was more confident “Now that I’m in my third year and every day not like, ‘Oh, my gosh, what am I doing to do? What am I going to say?’ Now that is just happening. I’m doing it [reflecting] even less and less, unfortunately. I think it’s missing” Lila will use critical thinking to identify strategies that motivate the student to want to take part in the future.

Analysis

Specific teaching event. It can be embarrassing when an observed teacher has to work with a student who refuses to comply. This was the significant event in Lila’s classroom the day I observed. Rather than begin a power struggle, Rebecca asked the child to sit down, and stated “Your turn is over.” Afterwards though, Rebecca reflected about the event:

Just during circle time I wanted [student’s name] to say “My name is [student’s name]” and she was refusing intentionally. I kinda just said, “Your turn is over. Go sit down and then I heard her as the next kid goes up, “My name is [student’s name]. So she says this. So now I’m going to go back and think about that. It’s also behavior management, but to get her to want to do it the first time. I’m going to have to think about that now. That will help me be a better teacher just to know on the spot what to do in the situation like that when it comes up (Lila).

Lila questioned the student's behavior and realized she needed to plan how to encourage the student to engage because she wanted the child to take part in the activities, not merely to comply because of behavioral incentives.

Overall analysis. Lila was in her third year of teaching and becoming confident in her abilities. She had her classroom set up well and planned activities that were engaging to the students while simultaneously meeting their IEP-based needs. She stated she believed critical thinking was very important but lamented the lack of time to reflect and critically think.

Lila, with three years of teaching experience, appeared to be developing a strong self-efficacy. She discussed the importance of verbal persuasion for others with remarks such as, "Support from my principal. Good feedback. Good feedback from my coworkers." In addition, she included the importance of master experiences: "It is just trial and error and learning, what to prioritize, and how to organize everything and getting to their level, talking to them age appropriately."

Lila might critically think more than she realized. She identified an activity that didn't progress as she wished due to a student's lack of cooperation. By her discussion of the incident, it was evident she was already starting to reflect upon it: "So now I'm going to go back and think about it."

Interpretation

Critical thinking and effective teaching. Lila indicated she does not think critically as much as she would like, although she identified one event she was going to reflect upon, which was the identified event when the student would not comply. She stated she reflected more during her beginning year of teaching because she had no prior experiences for support.

Critical Thinking, Classroom Organization, Emotional, and Instructional Support.

Lila believed emotional support was the most critical component of teaching in a pre-kindergarten special education classroom. Emotional support was also the section of the CLASS in which she scored the highest. Lila encouraged her students to use language. As she continued to grow as a teacher, she can continue her good start in supporting student language by helping students to expand concepts.

Perceived critical thinking skills of pre-kindergarten special education teachers.

Lila's discussion of the student noncompliance event indicated she understood the need to problem-solve and make decisions. Even though she stated she probably did not think critically often enough, she believed in its importance for becoming a better teacher.

Meghan

Description

Meghan is an experienced pre-kindergarten special education teacher who co-teaches with a 4K general education teacher. Their shared classroom had activity areas that were clearly defined. During the first activity time, Meghan took six children out into the hall. Since it was a few days before St. Patrick's Day, the students selected a green hat, stated the name of the numeral on top of the hat, clapped the corresponding number of times and then looked under the hat to see if a gold coin was hidden beneath. The students were actively engaged in the lesson, waiting patiently for their turns while watching their fellow students.

During the lesson and the rest of the morning, Meghan was adept at using visual cues to help students understand requests:

On ground [patted ground].

Jeff, come sit down [patted ground].

The bottom drawer [emphasizing the word bottom while pulling out the bottom drawer]. She delivered the requests with a kind voice and the students cooperated.

Sitting in the hallway. When asked why she taught in the hallway, Meghan replied that the students were not engaged in small group activities while in the classroom due to the other activities happening at the same time. First she tried adding other students. This solution did not work because they were more advanced and the activities were no longer academically interesting to them. Then she tried taking her group of students out into the hall. Using the hall worked and she included moving to the hallway for activities as part of the set routine.

Making the connection. Meghan was also cognizant of her students' social and emotional needs. Before the hat activity, she asked the students, "What if I guess "4" and it's (the coin) not there? Nothing. And that's okay." Meghan showed passion when she talked about supporting the social and emotional needs of her students. She shared multiple resources she used to plan social group activities. She made many statements about the students' needs, including "They make that connection with you and they feel like you're listening to them and you're helping them out . . . If they feel like they're being supported they feel more willing to work with you and try the activities."

To determine who needed extra emotional support, Meghan observed student behaviors while looking for students who were either acting out or withdrawn. She considered both ends of the behavioral spectrum as a need for additional support, not reprimands.

Flying by the seat of the pants. Meghan planned for the weekly instructional activities by first reviewing the students' IEPs. She co-plans the activities with the 4K teacher and then modified the activities as needed to fit the needs of her students.

Even with her prior planning, though, Meghan acknowledged flexibility was crucial. She discussed the situation I observed when the computer applications for handwriting did not work, which required immediate problem solving and switching to a document camera. “Okay, let’s quick get the document camera. You know it’s flying by the seat of the pants and hoping the kids don’t get too rowdy while you’re trying to figure that out.”

Analysis

Specific teaching event. When I observed Meghan, she taught a small group of students sitting in the hallway. I was interested in why she chose to teach in the hallway when she shared a large, inviting room with another teacher. She explained:

I started working with the groups in the classroom at the beginning of the year, but I felt like I wasn’t keeping their attention because I saw the groups during discovery time so the kids were very much interested in what everything else around them, what was going on. Even when I tried to invite other kids into the group, then I found out that the kids that didn’t work on specific skills were taking over the group so it was just really difficult. So that’s why I decided to just start taking them in the hallway where it was less distraction. So I thought I could engage them more and they were picking up more and they were picking up on their skills.

Meghan demonstrated problem-solving, decision making and hypothesis testing when she determined students were not engaged in small group activities while in the classroom. She identified a problem, decided how to proceed, re-evaluated based on results, and determined the strategy was not working. She then made a new decision, tried it out, evaluated the situation, and decided it solved the problem.

Overall analysis. Meghan clearly described her use of critical thinking both before the lesson and during the lesson. When planning, she based the lesson objectives on the students' needs according to their IEPs. Meghan brainstormed and tried different accommodations including special seating options and fidget toys. During the lesson, she actively observed student behaviors and provided emotional support as needed. Finally, she made changes as needed during a lesson, switching technology quickly to keep the students actively engaged. She referred to this as "flying by the seat of the pants."

Meghan showed a strong sense of self-efficacy. She was not afraid to ask questions, request resources, and advocate for what her students need: "I'm not afraid to ask questions and to ask other people, you know, how are you teaching this lesson? What else can we do or how else can we reach the students? That's my strength." Meghan talked about how she and her general education co-teacher collaborate: "How we support each other is when we sit and plan . . . and taking through it to try to figure out each of the student's needs. Then that way we can meet them at their level and help them move forward." Research indicates this type of collaboration increases both teacher efficacy and student engagement (Gus et al., 2011).

Finally, Meghan's "flying by the seat of the pants" was an example of Schön's (1983) reflecting-in-action. Reflecting-in-action is critical thinking that involves continually analyzing and assessing what is happening while it is happening. This reflection-in-action includes practitioners who "use this capacity to cope with the unique, uncertain, and conflicted situation of practice." (p. IX)

Interpretation

Critical thinking and effective teaching. Meghan taught collaboratively with a pre-kindergarten general education teacher. This collaboration took additional critical thinking

because she planned specific lessons for her students with special needs, as well as, made sure they participated in an inclusive setting. She collaborated beforehand but used reflection-in-action during the lesson or as she stated, “flying by the seat of her pants.”

Critical thinking, classroom organization, emotional, and instructional support.

Meghan believed helping students develop their emotional skills was the most crucial part of her teaching. She stated emotionally supported students were more willing to take part in lessons. She was least concerned with room organization, probably because she was sharing the room with another teacher and so did not have as much control over the organization of the classroom. She did state the importance of organization though: "The more organized you are, the more that you can definitely get done."

Perceived critical thinking skills of pre-kindergarten special education teachers.

Meghan was the only teacher who scored above average on the HCTA. She did seem to think quickly when the handwriting app did not work. She quietly switched to the overhead projector in such a way that it went unnoticed by the students. This quick thinking was an example of Schön's reflection-in-action.

Meghan talked about thinking critically with her colleagues. Johns' (2011) model for structured reflection also emphasizes the importance of collaborative discussions. His model includes six iterative steps based on peer dialogues. The steps include reflection about self, the event, solutions, and possible impacts from the solutions. Meghan collaborated on a daily basis since she co-taught. She indicated she collaborated mostly about student behaviors. According to Meghan, she and her co-teacher reflected together and problem solved. Then they looked for resources to bring back and discuss as a team. Together they determined if the resources might

be successful or not for the student. The steps Meghan took to improve student behaviors mirrored the reflective steps in Johns' model.

Tosha

Description

Tosha's classroom had activity centers up against the walls while the center of the room was large and open. She explained this was because another teacher used the room for a small part of the day. As well as the typical activity centers, the room also included a sensory wall of different textures.

After the students arrived, they first painted paper plates orange to be later snipped with scissors to create Leprechaun hair. Tosha and her paraprofessional provided physical support ranging from hand over hand, finger grip adjustments, and differentiated paint brushes.

Harris: It's hard work.

Tosha: It is hard work, isn't it? Use your pinchers like this.

Harris: I can't.

Tosha. Yes, you can. There you go.

Harris: I did it! I did it!

Tosha: Yes!

Next, during circle time, students sang "Hello, _____. How are you today?" On the interactive whiteboard, each student moved an emoji face next to his or her name to represent how they felt. Then, after a story about a Leprechaun, Tosha sat and talked with her students while they ate a snack. Finally, the students played in their activity centers and the day ended a highlight – naming the new class fish.

Learning from others. As a second-year teacher, Tosha frequently referred to what she learned from other teachers. A visit to a school for students with significant disabilities inspired Tosha to create a sensory wall. She learned the Hello song from her student teaching cooperative teacher. Occupational and physical therapists suggested different adaptations and modifications. Tosha stated she made:

a lot of decisions as a team for which I am very grateful for as a newer teacher. Talking with different therapists is huge 'cause I don't know all about different sensory systems. I don't know different styles even, or different options that the district provides so having that communication and collaboration with others has been a tremendous help especially as a new teacher. I feel like that's just a huge part of decision making.

Tosha's willingness to ask questions and use feedback from her peers increased her effectiveness as a teacher.

Asking the questions. Tosha believed emotional support was crucial to learning: If they're really frustrated or really upset they're not going to get anything done. If they're having all these intense emotions, they're a lot less likely to stay focused or complete a task itself so there's all these other behaviors or they're tearing things off the walls. They're running out of the room. So, I think to just identify it is that first step and then how to process through that is that higher level. . . So starting it young, they can start to figure it out.

She believed an effective teacher needed to recognize and acknowledge how students were feeling:

Just asking those questions so if it's during our Hello song, if they choose sad

for example, I'll say 'Why are you sad?' and they may not be able to tell me that yet but then they also know that I'm recognizing that they're sad and also tell them 'I hope you feel better' or 'If you need a hug, let me know.' Sometimes I'll kind of notice that the tension is rising between two of them and I'll kind of sit back and watch at first, but if I need to step in, I'll do so. But I really want them to be able to do it. Probably right now they can't but they'll get there.

Tosha realized her students' emotional growth would impact not only their achievement this year, but in the years to come.

Analysis

Specific teaching event. One of Tosha's strengths as a teacher was differentiating to meet the needs of individual students. I asked her how she determined what each student needed to learn to write his or her name and she explained:

I know one of them was independently doing his name already and, okay, so he's ready whereas the one who's just working on the X, that's where he's at and he's younger than the rest of the other kids too and fine motor-wise is a lot weaker, so I know he's not ready for that yet. And then he [a different student] at the table, if he does trace [his name], he gets upset because he wants to do it by himself.

Tosha's explanation of differentiating for her students demonstrated critical thinking at the planning stage. She reflected on the needs and idiosyncrasies of each student to plan specific accommodations and adaptations.

Overall analysis. Tosha was in her second year of teaching. She worked to make sure she had classroom lessons and activities that met her students' needs, both developmentally and emotionally. She attributed many of her accomplishments to collaboration with others either indirectly by observing other teachers' ideas or directly through teacher conversations. As well as relying on her colleagues for support, she is also created her own master experiences. When asked how she learned to be an effective teacher, she responded, "Obviously going to school but I learned best by doing it. So kind of being thrown into it. I've kind of had to figure it out."

Tosha's view of teaching follows social constructivism. She relied on other teachers to support her teaching. She admitted as a beginning teacher her knowledge was limited. By acknowledging her limitations, she opened herself up for mentoring from other teachers. The teachers Tosha collaborated with created for her a zone of proximal development. Tosha had a base of knowledge from college and student teaching. However, by working with other teachers, she continued to raise her level of teaching knowledge and ability to teach effectively. In addition, research indicated pre-kindergarten and kindergarten teachers who collaborated tended to create a more seamless transition for their students from one class to the next, which in turn increased the quality of instruction (Guo et al., 2011). Tosha articulated the same strategy for her three-year-old students: "I follow what the 4K does since these kids start when they're three and then go to 4K. . . . I try not to do the exact same things so then they'll do it again, but even just that prepping even though it's a year ahead. They'll get some background knowledge."

Tosha's belief of self-efficacy followed the same pattern identified through research that high self-efficacy during student teaching lowered during the first-year of teaching and then slowly rose again (Hoy & Spero, 2005):

I mean, coming right out of college I feel everyone feels like, okay, I'm going to

do great. I'm going to set my classroom up like this. But then because special ed was my minor I felt very overwhelmed right away. Okay, this is not how I thought it was going to be. And part of that was realizing that. That I'm not a twenty-year teacher, I'm a one-year teacher. I'm starting from the beginning, and that's okay. An even this year, I feel so much different than last year. I feel like, okay, I've survived my first year. I'll try again. Let's do this instead. Or let's organize this way. So, I mean obviously I feel confident in what I'm doing now but I know I can always improve.

Tosha's current confidence was also bolstered by the support she received from her peers.

Interpretation

Critical thinking and effective teaching. Tosha as a second-year teacher acknowledged she does not have as much background knowledge as a veteran teacher. Therefore, she relied on her colleagues to mentor her. As a teacher who is open to new ideas, Tosha is likely to self-reflect (Danielowich, 2012). Therefore at this point in her career, she is more likely to reflect-on-action than reflect-in-action.

Critical thinking, classroom organization, emotional, and instructional support. Tosha rated emotional support as an essential characteristic of an effective pre-kindergarten special education teacher. However, she also planned lessons, differentiated for students and maintained a well-organized classroom. Therefore, Tosha attended to all three components of effective instruction when planning and teaching lessons.

Perceived critical thinking skills of pre-kindergarten special education teachers. Tosha stated that thinking critically was crucial to meet the varied needs of all her students. "Every child is different. They all have their own stories. Their struggles, figuring out how to help them best can be a struggle, but through the help of other teachers, other therapists, we try

to come up with the best solutions or keep trying different ideas." Tosha worked with colleagues to collaboratively problem solve and make decisions, which related to Johns' (2011) model of reflective practice.

Erica

Description

Erica was a veteran educator who had taught in an pre-kindergarten special education classroom for twelve years. Erica provided a language-rich environment for her students. Not only did she encourage student conversations and expand their sentences, but she also included sign language. The students were engaged as Erica read a story involving paint, colors, and a bunny." She connected the story to her own life and the students' interests. "I have a puppy. I have a white puppy at home." "Our rabbit became purple. Dale, that's your favorite color." "You're right, Anne. She's going into the blue paint. Anne saw it."

After the story and a look at the schedule, the students took part in a color matching activity with a twist. One at a time, each student picked a colored egg, rode a tricycle the length of the room and dropped the egg into a basket of the same color. All students were successful, although they all needed different amounts of support to ride the tricycle, which they received.

Erica made classroom expectations clear both for social interactions, "Say Thanks. We are good friends," and classroom procedures, "We're going to get ready for our painting. Where do we go to get ready for our painting?" The painting activity and snack time finished the day. Both activities included teacher-child conversations and student choices. The students transitioned to going home with the same engagement as the rest of the day.

Basing the day on student needs. According to Erica, all aspects of the school day, lessons, instruction strategies, classroom organization, and emotional support were based on student needs:

“It’s based on needs.”

“It’s based on student needs.”

“It’s again based on their needs.”

“I think again, it’s just based on student needs.”

“It is again based on student needs.”

“It’s really looking at all different areas and what the students need. And that’s always the forefront of how I plan and pick activities.”

Erica determined these needs from the students’ IEPs, from what typically developing students achieved, and from constant observation. Erica stressed the importance of student observation by stating that the most difficult skill was determining the needs of a student that she did not yet know.

Riding trikes and matching colors. Erica stated the combination of riding tricycles and matching the color of eggs to baskets met both student needs of practicing motor skills and matching colors while keeping students engaged. "It just gives it a new element, something that makes it more interesting for the kids. More fun to do."

Feeling comfortable and safe. Erica believed emotional support was as important as all other aspects of teaching. She stated the students needed encouragement, mainly to try new skills and activities. "They need to feel that they're supported and praised on their efforts, especially on new things that they haven't experienced, that they feel comfortable and safe to be able to do those things."

Trying to be reflective. Even though Erica had taught for twelve years and provided a well-organized day for her students rich in language and based on their individual needs, she still believed she needed to reflect:

I think a lot of it is just trying to be reflective when you do a lesson, and you think, okay, how did that go? Just working through in my head what went well, what should I kind of change, what didn't work. Was there too much waiting time? All of those kind of things. I think really just being reflective and thinking. Thinking things through.

Erica's constant reflection helped her create a language-rich environment for her students.

Analysis

Specific teaching event. Like Tosha, Erica was adept at differentiating for individual students. This was apparent in her discussion of the tricycle color matching activity:

How I structure a lesson or activity, I plan all going to that instructional support. Today, for doing the bike, one of the students can do it independently without me. The other one just needs a little support to get going and the other one needs more support with just setting it up and helping them so that they can be successful. (Erica).

She realized the end goal was for all students to succeed and she therefore planned accordingly. This planning involved decision making. She determined what each student needed and how to provide the individual support to make sure each student was successful.

Overall analysis. Erica determined her students' needs not only based on formal assessment and IEPs, but on her observations. She believed she had to work with a student and build a rapport before she truly knew the student's ongoing needs. Self-reflecting on her

observations helped Erica to continually adjust planning and instruction to meet the individual needs of each of her students.

Although Erica did not mention collaboration with other teachers, she talked about the importance of knowing what typically developing students achieve and working towards these goals with her students with special needs. When asked her strengths, Erica replied, "I think I try to be positive with the students and promote their independence as much as I can and support them along with that." These two strategies, working towards typical behavior and independence will help their transition to an inclusive kindergarten setting in the future.

Erica was an experienced teacher who received a perfect score on the CLASS assessment. The students in her class were well behaved, engaged, and excited about the learning activities. During the interview, Erica stated the students needed to work on behaviors at the beginning of the year. When asked how she helped them, Erica replied, "We worked on behavioral expectations, classroom rules and we do a lot of practice waiting turn taking. They know that they're going to get their turn. That helps to learn the routine of that." This confidence in achieving high behavioral expectations was probably connected to high self-efficacy. She knew how to support children in learning expectations and how to act in a classroom. She succeeded in teaching these expectations, which in turn, helped raise self-efficacy beliefs (Tschannen-Moran & Hoy, 2007).

Erica used reflective critical thinking throughout her day. She reflected as she planned lessons, observed students, and adjusted lessons. She seemed to do this effortlessly which connected to Kounin's (1970) "withitness" or Schön's (1983) knowing-in-action.

Erica discussed how knowing the students improves her teaching:

Sometimes you don't know, especially when children are new and you don't

know how they're going to react and you don't know how they're going to be when they're introduced to new things or new people or new scenarios, or going to different places so that sometimes it's hard to predict some of those things when you don't know the kids. That can kind of make it challenging."

Erica's comment connected to Berliner's (2004) research that indicated teachers are more effective if they knew the students.

Interpretation

Critical thinking and effective teaching. Erica had well-prepared lessons and worked to make sure students knew classroom expectations. This pre-planning allowed her to concentrate on providing a language-rich environment for her students. Her teaching appeared effortless, indicating Kounin's withitness. When discussing critical thinking, she talked about reflecting after the lesson was complete, which connected to Schön's reflection-on-action.

Critical thinking, classroom organization, emotional, and instructional support. Erica demonstrated strong classroom organization, well-planned lessons and appropriate emotional support for her students. She stressed the need for instructional support for each of her students. As an effective veteran teacher, the emotional support and classroom organization appeared natural for her to accomplish. This seemingly effortless teaching left time to devote to planning for the individual needs of each child. Experienced teachers tend to concentrate on evaluating and assessing student learning rather than self-assessing their teaching, (Kagan, 1999). This evaluation and assessment appeared to be what Erica was doing as she concentrated heavily on student learning.

Perceived critical thinking skills of pre-kindergarten special education teachers. Erica stated she critically thought when "looking at all different areas and what the students

need.” Erica's emphasis on meeting the individual needs of all her students requires (a) identifying problems, (b) determining possible strategies, (c) selecting one strategy and (d) determining the strategy's level of success. Of the HCTA components of critical thinking, meeting the individual needs of her students required decision making and problem-solving.

Mariah

Description

When I walked into Mariah's classroom, chairs were turned over, and items were in disarray. I was taken back at first until she laughed and said since it was St. Patrick's Day, a "leprechaun" had created havoc last night. At this point, I also noticed the gold glitter on the tables and footprints made from powder on the floor.

While waiting for the students to arrive, Mariah sat on the floor by a boy playing with trucks. Mariah conversed with the student while emphasizing vocabulary.

“Do we want to put it next to the road?”

“Do you want a curved or straight one?” [holding up train track pieces]

“This one’s short. This one’s long.”

The rest of the students arrived and showed curiosity toward the intentional chaos. After talking about the leprechaun, Mariah and the students placed the chairs upright and the students convened on the rug. The students sang a Hello song that stressed emotions. Then the students followed clues to find the hidden pot of gold.

After the treasure hunt, the students returned to the circle rug to talk about the letter /f/. The students were still squirming from the excitement of the treasure hunt. Although at first, Mariah was going to pass around the objects that started with /f/, she decided to show the objects

instead. Next the students went to the art table to make shamrock necklaces. As the students became engrossed in the activity, they calmed down and started working quietly.

Throughout the morning Mariah stated expectations "When we are all ready, then I can turn the music on," and positively gave feedback, "I like it when you sit. That shows we're ready." "Feel free to come back when you're making a happy choice."

During a second circle time, students each had a binder with their classmates' photographs and picture prompts to join in conversations. These picture prompts were also located in the block center and on the students' snack placemats.

After free time play and a snack, it was time for the students to leave.

Organizing the room. Mariah articulated a clear description of her thinking when organizing her classroom:

My aide and I just kind of started over. . . Messy stuff we try to keep over by the sink. So it's easy for them to go wash their hands. We keep the art table here just because of the counter. We can set all our stuff up on the counter so it's easy to grab. Markers and everything are kind of tucked under there but you know again they're right by the art table if we're missing something. That little table we've . . . put it into just like a quiet corner where they can do a quiet game, something simple, matching activities, something they don't need a whole lot of help. If they're overwhelmed they can kind of sit over there and do some quiet work. The toys – we in the past have had a few kids that needed more simplistic toys. This year is a little different but we put that there just because we have all the pictures up there and they request the toys. So that space is a little different, but it's nice because it's kind of closed in and gives them a spot to drag their cars [so they are] not all over the place.

Through her description of arranging the room, Mariah demonstrates decision making based on critical thinking. There was a logical explanation for the classroom organization.

Quieting the crowd. Mariah decided in the moment not to pass out objects that began with /f/:

The students were pretty excited and fired up. Typically we do pass them but I decided to just hold on to them today just 'cause I felt like it was the right thing to do. They were very excited and very fired up. Some kids were having a hard time sitting. So I just made the decision to show them [the objects].

Mariah's in the moment decision is an example of Schön's (1983) reflection-in-action.

Knowing what they are like. Mariah believes students have to feel comfortable and safe before they learn. She creates this safe environment through positive comments to her students and creating an organized classroom with a set routine. She states it "helps them get comfortable and get settled in easier when they can predict what's happening." Mariah realizes which students need extra support through observation "I just kind of know what they're like on a day-to-day basis. . . (if they are sad) we just try to make them feel welcome and give them extra hugs and give them an extra job or two to kind of boost their morale." Through observing, knowing her students, and organizing a predictable routine, Mariah prepares her students for learning.

Pouring in your heart and soul. Mariah believes teachers must have 100% commitment to their students. She challenges herself to give her students the same caring environment and engaging lessons she hopes her own children have. Although she sets this high goal for herself, she also knows that unexpected events happen and she has to remain flexible.

You've got to be flexible in your teaching. You know things happen throughout the day

and you can't predict what you just kind of have to go with it and make the best of it and just, you know, know that you're here for the kids and do your best work and, you know, pour your heart and soul in.

Analysis

Specific teaching event. Mariah's decision to not pass out the /f/ objects is an excellent example of Schön's (1983) reflecting-in-action:

The students were pretty excited and fired up. Typically we do pass them but I decided to just hold on to them today just 'cause I felt like it was the right thing to do. They were very excited and very fired up. Some kids were having a hard time sitting. So I just made the decision to show them (Mariah).

She observed her students and realized they were much more active than usual. She quickly thought about what might happen if she passed the objects and decided to change her lesson at that moment. This change during the lesson showed confidence in teaching and managing behavior. She completed the assignment without riling the students up and then transitioned them to a calming activity. This adds another successful master experience to her prior knowledge.

Overall analysis. Mariah strives to keep her classroom organized with clear expectations and routines to create a warm, safe environment for her students. She knows her plans might have to change in the middle of a lesson, such as with the lesson about words that begin with /f/. Knowing her students and creating the same experience she would want for her own children is the goal she tries to achieve on a daily basis.

Mariah also uses reflection-on-action. When asked how critical thinking benefited her as a teacher, she talked about the reflection with her paraprofessional at the end of the day. "We

kind of go back at the end of the day, okay, what worked? What didn't work? I guess just thinking of different strategies is a really good way to say I would use critical thinking." This end of the day collaboration includes the critical thinking task analysis that helps improve student learning (Tschannen-Moran et al., 1998).

Interestingly, Mariah indicated both her strengths and weaknesses as a teacher included her collaboration with colleagues. She feels she is open to suggestions from other professionals, but having a different opinion on how to handle a situation is a difficult conversation. These discussions with her colleagues follow research that indicates there is a link between teacher collaboration, teacher decision making and pre-kindergarten student achievement (Guo et al., 2011). However, collaboration requires trust, shared relationships, and reflection. Lack of these attributes may lead to a disconnect among teachers (Kennedy & Smith, 2013). A possible disconnect during difficult conversations may be the feelings of weakness she has from some of her collaboration attempts.

Interpretation

Critical thinking and effective teaching. By not choosing to pass out the /f/ objects, Mariah demonstrated Schön's (1983) reflection-in-action. This led to less disruption in the classroom, which, in turn, allowed Mariah to effectively teach the remainder of the lesson and transition smoothly to the next activity.

Critical thinking, classroom organization, emotional, and instructional support. Mariah gave a clear explanation of how she organized her room. Her decisions were logical, and thus, showed critical thinking. Mariah also stated the students must "feel comfortable and safe before they learn." Mariah also gives students opportunities to expand their use of language by

providing pictures to use as conversation starters. Mariah uses all three areas assessed by the CLASS to teach her class effectively.

Perceived critical thinking skills of pre-kindergarten special education teachers.

Mariah stated she critically thinks about the outcome of her actions: "If I do this, what's the outcome going to look like?" Then, afterward, she questions what worked, what didn't work, and what strategies she might try in the days to come. Therefore, Mariah uses Schön's (1983) reflection-in-action while she is teaching and reflection-on-action with her para-educator at the end of the day. She also uses decision-making and problem-solving to organize her classroom.

Cara

Description

Cara's room was large and inviting. It had designated activity areas and plenty of room for movement. Two boys were in the classroom. Two more children would arrive later. Cara called the two boys over to the sensory table which was empty. She asked them what they wanted to put in the table. When they did not answer, she suggested rice or dirt. The boys unanimously declared "Dirt!" One boy asked to have grass in the dirt. Cara replied, "I don't know if we can grow real grass, but maybe we could use something else." Cara went to her supply closet and returned with green pipe cleaners. "How about if we cut these pipe cleaners?" The boys agreed and Cara cut the pipe cleaners into approximately two-inch pieces. She added shovels and the sensory table was complete. As the children played, Cara used positive feedback to help manage their playing:

"Grant, before you take a shovel from Jackie, see if there is one that no one is using."

"You have a whole bunch of dirt. I don't think it would be kind to take Harrison's dirt."

"You've got two more minutes my friends and then it will be time to clean up."

After a short lesson on the letter "y", Cara read "Bear Wants More" with an engaging voice and including hand gestures. After the story, which told about the animals that appear in spring, the students made bird feeders out of peanut butter, seeds, and pinecones. Cara gave the students clear and explicit directions:

"Show me your finger."

"Where is the top of your pinecone?"

"Put your pinecones down on the table. Then I know you're listening."

"Where did I hold my pinecone? In the middle or the end? [Children: "The end."] "Yes, then I won't get my fingers messy."

"Is it okay if my handle comes off? Yes it is. I can put it back on or ask for help."

The birdfeeders were placed in bags to take home. After snack time and outside play, the students were ready to go home.

Collaborating and getting creative. Cara talked about gathering ideas from other teachers. The idea to sequence photos of art projects to show directions and to use coffee cans as table-top mini-garbage cans came from other teachers. Cara feels the most important collaboration is with occupational, speech, and physical therapists. She feels she owes it to her students to collaborate:

Being a team player has been a huge factor and learning how to do this I picked up a ton from our OTs and our speech [teacher]. I feel like part of my job is to facilitate the outside therapies of OT, PT and speech to provide the best inclusive therapy I can for these kids and I pick up little bits that they each have that's going to make me a more effective early childhood teacher and if I say it this way and for my guys who have the s-blends that they're working on, I might use the word

sprinkle instead of the word pinch to get things because it means they have to try that s-blend a little more often.

Cara feels creativity is also important but a teacher has to be confident to take creative risks. When Cara asked the students to select the material for the sensory table, she was relinquishing choice and control to her students. She feels having the students feel ownership of the classroom is crucial:

I was hoping they would go for dirt. I had planned if they said something outlandish I would have said, "you know, I don't have those things." If they came up with something else I didn't have the supplies, I'd probably tell them I don't have that but that's a really good idea. Somehow again trying to encourage that I like your creative thinking but it might not work this time and if they were really having a hard time coming up with the ideas because I just had the two boys, I probably would have pulled them into my storage room and said, "Look, here's the things I have. What would you like to go in there?" Because again that element of control, letting them feel like that they own part of the room, that they get to pick the things that are interesting to them. They're going to be more interested in what's going on as we saw with the dirt. Oh! I haven't seen them that excited about a new sensory table in a very long time so it's cool for them to just have that ownership and say "Oh, yeah. I get to pick from the dirt." You know when one really wanted grass, okay, what can we use for grass and I just happened to know green pipe cleaners. I should have enough of them that I don't care what happens to them. It's pipe cleaners. We get creative. We get unique sometimes in the way we do things but I try to follow their lead as much as I can with reason. To make them feel like they own

part of the room and they get choices, too. It's not just my room. It's their room and it's our room and we're here to work as a team.

Being there for them. Cara feels emotionally supporting her students is crucial:

It's [emotional support] incredibly important. To me it's one of the most important things especially at this age level because if they're not emotionally ready to be here, ready to learn, it doesn't matter how cool or creative or interesting my lesson is, they're not there to learn it. They're stuck in their own heads and what else is going on, what's stressing them out. To be there emotionally for them and reminding them that we are here for you. We do care about you is really the biggest most critical piece for me. So we spend a lot of time at the beginning of the year building those relationships, making sure that they know that if something is bothering them, I want to know about it. I want to hear about it. I want to be there for them and help them work through the problem.

Cara feels building relationships with her students is the first step in emotionally supporting her students.

When asked how she knew when students needed emotional support, she stated she just knew:

Their demeanor kind of shows it. I know their personalities well enough at this point. I have an advantage that way having worked with them for more than a year.

To know once something's not quite right. I look at them and I can just see it in their eyes. You can see it in their body language. You can hear it in their voice.

The time Cara spends at the beginning of the year helps her know how her students are feeling just by observing.

By concentrating on building relationships and getting to know her students, Cara has an intuitive understanding of her students' needs.

Analysis

Specific teaching event. Cara's belief in student voice in her classroom is evident. Allowing this voice, though, takes confidence and quick decision making. Cara states: "I had planned if they said something outlandish I would have said, 'You know, I don't have those things'" and "You know when one really wanted grass, okay, what can we use for grass and I just happened to know green pipe cleaners."

Cara problem solved answers to possible student requests ahead of time. Then she used reflection-in-action and decision making to attain the student's request for grass. By critically thinking both before and during the event, Cara was able to easily allow students to feel their voices were heard.

Overall analysis. Cara feels teaching is a team effort. She gathers ideas from other teachers and collaborates closely with therapists that work with her students. As Cara feels teamwork with other adults is essential, she also wants to be a team with her students. She achieves this by selecting activities for specific groups of students and allowing student choice whenever possible.

Just as Rebecca, Cara also noticed the problem of students not playing with specific toys, in this case, the block center. While Rebecca solved the problem by modeling how to play with the marble game, Cara decided to add interesting elements to the block center, including cars and hollow tubes. Although solving the problem with different approaches, both strategies were successful.

Cara appears to be confident in her teaching abilities and skills in managing student behaviors. She intuitively understands the connection research has found between teacher self-efficacy and classroom management (Dicke et. al., 2014):

I respect them but I expect them to respect me as well and that kind of feeds into good classroom management. If you can't manage what's going on, the kids know it almost instantly. They know and they're going to try and every kid tries to test the limits, what's accepted, what's not.

Cara's confidence in her ability to create and maintain a positive environment for her students connects to both critical thinking and self-efficacy. She must critically think when she preplans her classroom organization and reflects-in-action while maintaining the environment.

Cara also discussed the aspects of critical thinking related to collaborative brainstorming:

We'll sit at lunch or we'll sit after school and say, "all right, we need to talk about this kid because what happened today really didn't work. What else can we do?"

And then to just sit there and brainstorm and to realize I don't have all the answers. . .

but if you get the right team of people together and the right collaboration together and you get talking and all of a sudden an idea can spark. That you go "Oh, but what if and then you can go from there and really develop some good plans."

Collaboration discussions based on critical thinking, trust in each other, and a shared belief in self-reflection leads not only to student achievement but also personal growth (Danielowich, 2012). Cara's discussion of collaboration demonstrates her beliefs that shared trust provides valuable opportunities to improve student learning.

Cara also discussed the difficulties of starting over in a new school:

So you go to a new district, you can jump right in, which in theory is great. In

practice, it doesn't work that way because you've got a whole new team to figure out, whole new kids to figure out, different dynamics of where the kids are, different dynamics of the parents and the families and what their expectations are. So, it's just been an ever-evolving door and just this year I finally feel I've hit a point where I can do some things I've been wanting to do."

Cara's description of switching districts connects to the decrease in self-efficacy many teachers feel when moving into new environments, and the eventual rise back to their former level. (Tschannen-Moran et al., 1998). In addition, she discusses the need to "figure out" the new environment, which requires critical thinking.

Interpretation

Critical thinking and effective teaching. Cara's comments strongly emphasize collaboration with both her students and other teachers. Cara talked about gathering ideas and brainstorming with other teachers. These teachers included general education teachers, physical therapists, occupational therapists and speech therapists. Johns' (2011) reflection model emphasizes the importance of collaboration with others. His model includes discussion of the event, possible impacts of the event, and future actions. By discussing ideas with others, Cara can achieve a deeper understanding of ideas and solutions.

Critical thinking, classroom organization, emotional, and instructional support. Cara uses her critical thinking skills to confidently allow her students to make choices in the classroom. This belief connects emotional support to classroom organization. By allowing students to make some decisions regarding classroom organization, she feels she is sharing ownership of the classroom. In addition, she uses collaborative brainstorming with her colleagues to identify problems and solutions to student needs.

Perceived critical thinking skills of pre-kindergarten special education teachers.

The critical thinking skills Cara demonstrates and discusses are mainly problem-solving with her colleagues and students. However, Cara also discusses the importance of individual reflection: "I really think it comes down to reflecting on each day and each kid." Therefore she understands the importance of both self-reflection and collaborative reflection as means to critically think.

Cherity

Description

Cherity teaches in an older school built in the early 1900's. Her room is large but somewhat awkwardly has two heaters and a fireplace that take up some of the space around the walls. Therefore she has more informal activity centers using tables placed around the room.

As the students ate breakfast, Cherity quickly made the final changes to the classroom schedule and comforted a child who had a bloody nose. Then she circulated among the students as they ate banana bread:

Murray: "I like pumpkin bread."

Cherity: "Oh, I like pumpkin bread, too. Do you know what I do at home? I put peanut butter on my banana bread."

After breakfast, the students transitioned to the circle area, one table at a time. She reminded the students to sit "criss cross applesauce" while she gently guided one student to the front of the rug. Each student had a chance to tell their news while she responded to each with

positive affirmations. The students then transitioned to use the bathroom "I need you to line up on the train line quietly."

When the students returned to the classroom, Cherity read a book about spiders. Cherity was expected to follow an International Baccalaureate curriculum so the students next spent time decorating musical kazoos while she circulated, helping if needed and giving positive feedback:

"This is where we're going to use our artistic ability."

"Ooh, a rainbow one!"

"Makes me think of a ladybug."

After students explored the activity centers and interacted with Cherity, the students returned to the whole group rug and played a game of number Bingo. After Bingo, the students once again lined up on the train line and left for music class.

Using what she has. Cherity bases her lessons on the International Baccalaureate curriculum and parent donations or what she has on hand:

Because we're an IB International Baccalaureate and with that I have four units of study that I have to do. This week we are in the arts so we're doing music, visual arts, a little bit of movement and a little bit of puppetry. I do a lot by what parents donate to me. I ask for donations and what comes in I brainstorm and come up with activities and then I have my staples that I do with the art teacher. I look at what I have. I'm a visual person and I like arts so I can kinda look at something and I can figure out something to do with it. Otherwise I google. Like if I have someone donate flannel board pieces, I google what to do with flannel board pieces and then come up with ideas from there.

Cherity's brainstorming to decide how to use donated materials is a type of problem solving. She starts with what she has and critically thinks how the materials can become an art project.

Letting it out. Cherity feels emotional support precedes academic achievement:

“If I don't support them, if I see them like I had a little girl out there crying this morning. If I didn't take care of that right away her whole day would be lost so you kind of have to put aside what you are going to be doing to handle that situation of how that child feels cause if you don't handle it right away or have my para handle it right away, that child's just not going to have a good day and if they don't have a good day then they're not getting anything out of what I do.”

In order to provide this emotional support, after breakfast Cherity starts the day by listening to her students, or as she says, allowing the students to “let it out”:

‘Cause they need to let it out and they want to be heard and that is the okay time just to let the talking and tell me whatever it is to get it off their mind because if I let them talk, and share whatever they need to share, then we can go on about what we're going to do the rest of the day.”

Cherity acknowledges each child and listens carefully. Once the students feel they are important to Cherity, they can more easily settle down and take part in learning activities.

Getting to know the whole child. Cherity uses assessment data to determine the instructional supports her students need. However, she also feels observation and knowing each child as an individual is crucial:

It's by observation and really getting to know your kids. . . it's really those first two, three weeks of school. The kids just do a lot of play and that

allows both of us to observe them and figure it out. Like, okay, this one's having a hard time with grasping a crayon so then we're working fixing the grasp and cueing them in on just little things. So, it's just really getting to know each individual child and what they need."

Using both formal assessment data and informal observation helps Cherity develop a good understanding of each student as an individual learner.

Cherity strongly believes determining when to provide emotional support is also based on observation and knowing the child:

We just know them. It's like that in that three weeks we just really try and get to know the whole child, the personalities. Try to get their personality and so like the little boy that was over there, I asked him if he was feeling okay because we can just tell by their face. Like we get to know them, their facial expressions, and like 'You're a little bit quieter than you normally are today. Are you okay?' and just kind of understanding them and talking with them.

By assessing and observing, Cherity takes in regard both academic and social skills to create a global understanding of the strengths and needs of each student.

Letting it go. Cherity feels it takes flexibility to make sure emotional support comes first:

You could be a good teacher but you just really got to care about the kids and you really have to be okay with letting go and that you didn't do everything on your lesson plan that day 'cause something happened, somebody needed you. So sometimes things don't always get done and you have to be okay with just letting go.

Cherity feels that without flexibility, lessons could be taught but students would not learn.

Analyzing the situation. Cherity uses critical thinking to determine when to continue with a lesson or when to become flexible and change or omit an activity:

It [critical thinking] helps me analyze what's happening in the situation so I can jump in and solve something before it escalates. Like it also kind of helps me, like okay, this isn't working. I've got to change it up right away so it can. You look at your teaching and yeah, that didn't work. Next time, I've got to do this or I've got to add this into it. You know, with critical thinking it's with the discipline too, I think. I go, "I didn't handle that so well." You've got to think about it and make that mental note of like, "I've got to change how I do that part."

Cherity's description of her use of critical thinking mirrors Schön's (1983) reflection-in-action. She continually evaluates how lessons are unfolding to determine next steps.

Being goofy. Cherity is very committed to providing the needed academic instruction and emotional support that her students need. However, she never forgets to relax and allow her students to be four-year-olds:

I'm goofy. I like to have fun with them. I want them to think that school is fun. Yes, we do all our academic stuff but I will be silly with them. I will wear a tutu in the classroom. I will because it gets them excited and they think school is fun and we just sit down and we talk and we have fun and I play with them.

By wearing a tutu, Cherity demonstrates confidence and a commitment to both the educational and social well-being of her students.

Analysis

Specific teaching event. Cherity had to decide in the moment whether to ignore a little girl who was crying in the hallway, stop working with other students and comfort her, or send her para-educator to comfort her. Cherity chose to go to the student herself:

I had a little girl out there crying this morning. If I didn't take care of that right away her whole day would be lost so you kinda have to put aside what you are going to be doing to handle that situation of how that child feels 'cause if you don't handle it right away or have my para handle it right away, that child's just not going to have a good day and if they don't have a good day then they're not getting anything out of what I do (Cherity).

Cherity analyzed the situation, thought of the consequences of not attending to the student and decided it was more important at that moment to comfort the student rather than work with the other students. This demonstrates Schön's (1983) reflection-in-action of quickly analyzing a situation and making a decision.

Overall analysis. Cherity bases her lesson on student assessment data, the International Baccalaureate curriculum and informal observations. However, she understands her students need emotional support to be ready to learn. She has high expectations for her students but makes sure there's laughter every day.

Cherity understands that good classroom management is essential. "If I don't have organization, it's chaos. I learned right away. . . If you don't have control of the classroom, they will control you." Cherity maintains classroom routines and schedules so "there's no surprises for them."

Cherity has taught for nine years and relies on her colleagues and master experiences to help maintain her self-efficacy:

A lot of it is experience, teachers in the past who give us their experiences helped out a lot and you know, theories going through education, learning all the theories sometimes isn't there. It's the real life, hearing real-life experiences and being in the field itself. Every year you gain new insights 'cause kids are constantly changing. Families are way different than they were when I first started. So, that real life experience and just collaborating with other teachers and talking with them and like, hey, I got this happening. What do you suggest? And being open to that communication.

These experiences of master experiences and positive collaboration connect to development of strong self-efficacy (Ross & Bruce, 2007). In addition, the master experiences and positive collaboration involve critical thinking to construct lessons, assess learning and analyze behavior. This supports the reciprocal relationship between self-efficacy and critical thinking.

Interpretation

Critical thinking and effective teaching. Cherity uses critical thinking to meet student needs while following a specific curriculum. This combination requires both analysis and creativity. She also uses Schön's reflection-in-action to change behaviors that might escalate or to make changes to a lesson in the midst of instruction.

Critical thinking, classroom organization, emotional, and instructional support. Cherity indicated all three areas, emotional support, classroom organization, and instructional support were crucial for effective teaching. However, she felt the emotional support of her students was the most critical: “. . . you just really got to care about the kids and you really have to be okay with letting go and that you didn't do everything on your lesson plan that day.”

Perceived critical thinking skills of pre-kindergarten special education teachers.

Cherity states thinking critically helps her “analyze what’s happening in the situation so I can jump in and solve something before it escalates.” She uses this reflection-in-action to monitor her classroom, support her students as needed, and prevent any unwanted behavior. In addition, Cherity uses problem-solving and decision making to choose activities that follow the International Baccalaureate curriculum while meeting the needs of all her students.

Anna

Description

Anna's room was large and comfortable. A rug and a large table for group activities clearly defined the activity areas. Anna started the day on the whole group carpet surrounded by students and books. Every student was actively engaged looking at a book, while Anna talked with each one of them:

“I’ll show you my favorite one” [picture in a book].”

“Oh, this is what we’re going to make today” [pointing to a picture of an umbrella].

“I wonder why he’s grumpy?”

“Turn the page and see what’s happening next.”

When the bell rang, the students put the books away and sang a Good Morning song.

After circle time, which included examining a rain stick, the students moved to a large table to make pictures of umbrellas. Directions were clear and explicit. Students had to choose a color for the top of the umbrella and state the name of the color. Then they glued it and a handle on to construction paper and used models to write their names.

“All right, Sabrina, you were listening.”

“You’re doing a good job waiting, Mike.”

After the students completed their umbrellas, Anna squirted shaving cream on the table in front of each student. The students were hesitant at first to touch the shaving cream but with encouragement, started smearing it around like finger paint. The students were allowed to squirt water on the table, and Anna dried the table. After the shaving cream activity, students played in centers and took a bathroom break.

The speech pathologist came in for an activity. While the speech pathologist worked with the children, Anna wrote in the students' notebooks that they would take home to share with their families. After outside recess, time to play with patterns, and a bean bag toss game, the students readied themselves to go home.

Melting like a snowman. Anna feels teacher support is vital in helping students learn how to express their emotions:

I feel like that mental health, the emotional, is so important to them.

Like [student's name], our little boy on the side there. He didn't melt down today but just sometimes he'll kind of melt like a snowman so I feel like if we can get them now to understand why they're feeling what they're feeling, it will help them as they go on. You know with him we're just trying for him to use his words. Like the other day, he just started crying and you know you just feel so bad. Like, what's the matter? Maybe it was a rough morning, you know, but he can't tell us. He can't verbalize it. But I feel like that emotional is so huge.

Anna feels that knowing her students and continually observing them is the first step in identifying when students need additional emotional support.

Going with the flow. According to Anna, humor, flexibility, and knowing your students are the three characteristics that make an effective teacher. She recalls a director of special

education tell her early on that she might only get through ten minutes of her plan and to give herself permission to be okay with that. “. . . and I just remember thinking that, you know, that’s true so it’s okay if, you know, if I’m not doing my whole plan. So just figuring out what they need and go from there.” Anna’s humor and flexibility of knowledge of her students creates a warm environment that supports learning.

Analysis

Specific teaching event. During an activity, Anna quietly helped a student put on a weighted vest. During the interview, I asked what she observed that helped her make that decision:

I think it just seemed like he was struggling to just sit and stay still. I mean he just really struggled compared to the rest of them and he usually welcomes that vest on. He kind of likes that weight on him. But I noticed if I put my hand on his back or something he doesn’t like that.

Anna used her prior knowledge of the student and previous experiences to know when a weighted vest could be beneficial. That day’s decision to have the student wear the weighted vest was based on prior critical thinking reflection on what the student did, and did not, find helpful.

Overall analysis. Anna is a warm, caring teacher who uses positive feedback and clear expectations to create an environment where her students can be actively engaged in the activities. She says you have to be okay with not getting through a lesson. Yet the day I observed, the entire day was smooth from quietly reading books at the beginning of the day, to actively smearing shaving cream and giggling while squirting water, and, finally, to lining up to go home.

Interpretation

Anna's understanding of students is essential to plan the best instructional activities and provide appropriate emotional support (Berliner, 2004). This understanding can be especially true for students who have special needs:

It seemed like he was struggling to just sit and stay still. I mean, he just really struggled compared to the rest of them and he usually welcomes that vest on. He kind of likes that weight on him. But I noticed if I put my hand on his back or something, he doesn't like that. He's uber sensitive to just sounds like you probably noticed him saying, What's that sound? What's that sound? Stuff we might not even notice, he's hearing.

Anna's description of her student demonstrates a use of critical thinking to study and understand the idiosyncrasies of each student.

Research indicates classroom organization is a key indicator of student achievement (Curby et al., 2009). Anna agrees: "I think it's important [organization] because I feel like you can lose them easily if you're not organized and then the noise level goes up and I mean everything escalates. So, I feel it's pretty important." Like Rebecca and Cara, Anna noticed the problem of lack of student engagement in the activity centers. The problem she observed was students flitting from activity center to center rather than playing for an extended time. She decided to use organization management to solve the problem. Anna introduced the expectations that students would stay a specific amount of time in the first center they selected before moving. She set a timer to give the prompt when they could select a new center.

Another reason for high instructional quality in Anna's classroom is her collaboration with the 4K teacher. Research indicates teachers at successive grades who collaborate create a

better-aligned curriculum (Guo et al., 2011). Anna explains: "Sometimes I'll talk with the 4k teacher to see what she would like them to be doing and then maybe depending on what their area of disability is I can modify that way."

Anna discussed all four experiences that research ties to strong teacher self-efficacy, which are master experiences, verbal persuasion, vicarious experience and physiological awareness (Bandura, 1977):

- "I remember talking to the special ed director . . . [who said] You might have a day planned and then you might get through ten minutes, you know, and I just remember thinking that, you know, that's true so it's okay if I'm not doing my whole plan." (verbal persuasion)
- I think just observing my peers because it's all kindergarten down here, 4K, and Mrs. Webber's wonderful." (vicarious experience)
- "Since I've been down here, maybe just seeing a lesson go through and seeing the kids get excited makes you feel good that they're happy and learning." (master experience and physiological awareness).

Critical thinking and effective teaching. Anna used her critical thinking skills to observe and understand both her students' academic and emotional needs. She collaborated with her colleagues to identify what her students needed to transition successfully to a 4K classroom. She continually observed her students and determined when a student needed emotional support, which is an example of Schön's reflection-in-action.

Critical thinking, classroom organization, emotional, and instructional support. Anna indicated the importance of targeted instruction in helping her students not only succeed in her class but to later transition to 4K. She stated the importance of classroom organization

because without it, "the noise level goes up and I mean everything escalates." However, Anna feels emotional support is crucial. She believes it is okay not to get through a lesson if emotional support is necessary. Meeting emotional needs comes first.

Perceived critical thinking skills of pre-kindergarten special education teachers.

Anna demonstrated problem-solving skills when she identified the students were not using the activity centers effectively, identified a solution, and introduced a new behavioral expectation which solved the problem. Like Rebecca, she also discussed the importance of supporting mental health, which is an example of a higher level reflection on a societal issue. In addition, Anna used critically thinking to determine when to continue with a lesson and when flexibility and changes were warranted.

APPENDIX I:

Teacher References to Critical Thinking and Effective Instruction

Theme	Text Reference
Anticipating Problems	Cherity: "It [critical thinking] helps me analyze what's happening in the situation so I can jump in and solve something before it escalates."
Anticipating Problems	Rebecca: "When I do a lesson, I'm thinking what can happen? What could happen? What I want to happen."
Anticipating Problems	Mariah: "If I do this, what will the outcome be?"
Anticipating Problems	Rebecca: "What's going to come up in swimming? How to prepare them for that?"
Collaborating with Other Professionals	KJ: "That team critical thinking" "A lot of brainstorming with other professionals, too"
Collaborating with Other Professionals	Meghan: "And once awhile Holly and I on Fridays, when we have our lesson planning time: What are we going to do about so and so? They're really struggling here."
Collaborating with Other Professionals	Tosha: "Figuring out how to help them best can be a struggle, but through the help of other teachers, other therapists, we try to come up with the best solutions or keep trying different ideas."
Collaborating with Other Professionals	Cara: "We need to talk about this kid because what happened today really didn't work. What else can we do and then to just sit there and brainstorm. I don't have all the answers, but if you get the right team of people together and the right collaboration together and you get talking, all of a sudden an idea can spark."
Determining Instructional Strategies	Tosha: "Differentiating handwriting based on what students can do."
Determining Instructional Strategies	Rebecca: "I was collecting data and finding out where he was at and completing assessments for him so I could figure out where his holes were for learning."

Theme	Text Reference
Determining Instructional Strategies	KJ: "How can I help H benefit from circle time? 'Cause right now I don't think she does. She has a hard time targeting things. So I sat one day and thought: What can I do? What do I have?"
Determining Instructional Strategies	Meghan "We do a lot of observing and that's how we kind of figure out so by observing the kids where they are, what would be most helpful."
Determining Instructional Strategies	Mariah: Thinking of different strategies is a really good way to say I would use critical thinking especially the behaviors because sometimes those are the hardest. It's like: Why does that happen? What can we do to prevent that from happening?"
Reflecting on Lessons	Erica: "How did things go? Just working through in my head what went well, what should I kind of change what didn't work. Was there too much wait time? Really just being reflective and thinking."
Reflecting on Lessons	Mariah: "We go back at the end of the day. What worked?"
Reflecting on Lessons	Cara: "I really think it comes down to reflecting on each day and each kid."
Reflecting on Lessons	Cherity: "You look at your teaching and yeah, that didn't work. Next time I've got to do this or I've got to add this into it."
Reflecting on Lessons	Rebecca: "What are they playing with? What are they not playing with? What are they getting from playing with that? What do I want them to learn?"
Reflecting on Lessons	KJ: "So on days off or Wednesday I really try to do a lot of critical thinking. Especially I'll sit and think about the kids. How did this week go? What can I do to improve?"
Reflecting on Lessons	Meghan: "I'm one of those people that at the end of the day I reflect on everything we did and what you know how that lesson went and how it could be done differently and reflecting on different students or different things that happened during the day and how we can help make that better."
Reflecting on Lessons	Lila: "Improving my quality of teaching. When you stop and think about why you're doing this. I'm going to have to think about that now. That will help me be a better teacher just to know on the spot what to do in the situation like that when it comes up."

CURRICULUM VITAE

Nancy Sim

Place of Birth: Decatur, Illinois

Education

University of Illinois at Urbana-Champaign

Bachelor of Science Degree with High Honors in Special Education - 1978

Master of Education Degree – 1981

University of Wisconsin-Milwaukee Doctoral Student in Urban Education - 2018

Minors: Administrative Leadership

Statistics and Educational Measurement

Dissertation Title: Critical Thinking Skills of Pre-Kindergarten Special Education Teachers:
Teacher Quality and Decision Making

Work Experience: Silver Lake College of the Holy Family, Manitowoc, Wisconsin

2015 – Present

Department Chair of Graduate Education/Director of Graduate Education

Plan and facilitate monthly Administrator Leadership seminars

Schedule graduate level courses

Recruit and retain adjunct instructors

Collaborate with marketing department to keep advertising materials current

Collaborate with admissions department to increase applications

Advise graduate education students

Oversee graduate education cohorts in Chippewa Falls, Manitowoc, and Pulaski

2016 – Present

Associate Professor of Education and Early Childhood Special Education Licensing Coordinator

2006 – 2016

Assistant Professor of Education and Early Childhood Special Education Licensing Coordinator

Courses Taught:

Foundations of Early Childhood Special Education – Face-to-Face and Online Formats

Development and Disorders in Early Childhood Special Education – Face-to-Face and
Online Formats

Assessment in Early Childhood Special Education - Face-to-Face and Online Formats

Curriculum and Methods in Early Childhood Special Education- – Face-to-Face and
Online Formats

Foundations of Cognitive Disabilities, Learning Disabilities, and Emotional Behavioral Disabilities – Face-to-Face Format
Roles and Responsibilities (of Special Education Teachers) – Online Format
Educational Measures and Assessment – Face-to-Face Format
Classroom and Behavior Management – Face-to-Face Format
Transition to a Professional Career – Online Format
Research Design – Blended Format
Special Education as Leader – Online Format
Proposal Development Seminars – Online Format

Practicum Supervisions:

Clinical placements in inclusive settings: Birth-to-three; pre-kindergarten; kindergarten; and primary, first through third grades

Student teaching placements in inclusive settings: Birth-to-three; pre-kindergarten; kindergarten; and primary, first through third grades

2013 –2017

Score EdTPA special education portfolios for Pearson

2013 – 2014

Assistant to Director of Graduate Education

Planned and facilitated monthly Administrator Leadership seminars
Completed final evaluations of program finishers in Chippewa Falls and Pulaski
Wrote rough draft of Reading license proposal

Courses Taught:

School Law Special Needs (Administrator Leadership program) – Online Format
Meeting Special Needs (Teacher Leadership program) – Online Format

2003-2006

Assistant Director of Silver Lake College Special Education Clinic and Adjunct Instructor

Courses Taught:

Educational Measures and Assessment – Face-to-Face Format
Adaptations and Modifications for Learning – Face-to-Face Format

Professional Presentations:

Fall, 2014

In collaboration with Dr. Amy Otis-Wilborn, UW- Milwaukee and Dr. Margaret Bartlett, UW-Milwaukee:

Qualitative research to determine how educators make sense of the alignment process among four layers of learning outcomes: 1. Common Core Standards/Essential Elements/Wisconsin Model Early Learning Standards, 2. Individual Education Plans (IEP)/Individual Family Service Plans (IFSP), 3. learning targets, and 4. lesson objectives.

Fall, 2012 – Spring, 2014

Silver Lake College, Special Education Program Development State Grant:

Using Professional Learning Communities (PLCs) as an evidence-based practice to promote accessible and differentiated learning for all students: theory to practice

Professional Publication:

2015 Bartlett, M., Otis-Wilborn, A., & Sim, N. J., (2015) CCSS: Rigor or righteousness in special education. *Journal of Reading Education*, 40(3), 23-30.