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Pedagogical reasoning of pre-service teachers: Juggling priorities and managing resources

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University of Northern Iowa

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2015

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PEDAGOGICAL REASONING OF PRE-SERVICE TEACHERS:
JUGGLING PRIORITIES AND MANAGING RESOURCES

An Abstract of a Dissertation
Submitted
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Approved:

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December 2015

ABSTRACT

The purpose of this study was to examine the cognitive and motivational factors related to the development of self-regulated teaching. These factors were defined by Shulman (1986; 2006) as theoretical, practical and moral knowledge for pedagogical reasoning. This study occurred in a clinical, instructional setting specifically designed to provide pre-service teachers with the environmental factors necessary to support the development of self-regulated instructional decision making. These factors included specific modeling of teacher thinking, regular formative feedback, instructional autonomy and strategic reflection. An instructional sequence based on Schunk and Zimmerman's (1998; 2007) Model of the Development of Self-Regulatory Skill was applied which allowed pre-service teachers opportunities to observe, emulate, control and self-regulate teaching decisions.

This study used interpretive content analysis to examine how preservice teachers recognize teaching decisions and apply three types of professional knowledge in order to justify decisions related to reading instruction for elementary students.

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DEDICATION

I dedicate this dissertation to my loving husband, Rod, who listened to my doubts and fears throughout this entire process and also to my children, IsaBella and Parker, who became all too familiar with the phrase 'Mommy's working.' Without the three of you, any accomplishment I may complete means so very little.

I would also like to dedicate this dissertation to my grandparents, Cyril and Jeanne Burns. It was because of your generosity and support that I was able to go to college after high-school graduation. I am proud to be able to provide you with this return on your investment, so many years later. My grandmother was my first teacher, teacher-educator and mentor. I cherish the days I spent in your classroom, watching the care you demonstrated for your nursery school students provided me with a tremendous model throughout my career. Your creativity and inventiveness was evident as you constructed paper-mache giraffes and graduation hats. My only regret is that you will not be present to watch me walk across the stage at graduation, but I know that I have made you proud.

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Also, I thank Dr. Rick Traw who was not only an original member of my committee but also one of my greatest influences during my initial teacher preparation. You stand out as a great leader and teacher. Your influence will remain with me throughout my career.

Thank you to Dr. Linda Fitzgerald and Dr. Salli Forbes who assumed the responsibility of co-chairing my dissertation committee and making it possible for me to complete my degree. I also thank Dr. Curtis Nielsen for joining this study partially into completion and Dr. Kerri Clopton who persevered with me throughout the bumps in the road.

Finally, I would like to acknowledge a certain high school teacher, who will remain nameless and will likely never take the time to read this document. You probably do not remember the comment you made and I am fairly certain that you don't know I heard it, but I have replayed your words in my head countless times, "Do you really think she can make it? Just look where she comes from." Thank you for making sure that I never underestimate the potential within any of my students.

TABLE OF CONTENTS

LIST OF TABLES	viii
CHAPTER I: MEETING SAM	1
Juggling Priorities	4
Managing Resources	5
Seeking Learning Opportunities	6
Taking Action	7
CHAPTER II: FINDING MEANING IN THE NARRATIVE	9
Juggling Priorities: Self-Regulation.....	9
Managing Resources: Pedagogical Reasoning	11
Seeking Learning Opportunities: Teacher Education	12
Taking Action: Purpose of the Study	14
CHAPTER III: REVIEW OF RELATED LITERATURE.....	17
Pedagogical Reasoning	19
Theoretical Knowledge	21
Practical Knowledge	23
Moral Knowledge	27
Development of Pedagogical Reasoning	29
Self-Regulation	32
Development of Self-Regulation	34
Observation	34

Emulation.....	38
Self-Control.....	39
Self-Regulation.....	41
Development of Self-Regulated Teaching.....	43
Summary.....	45
CHAPTER IV: METHODOLOGY.....	47
Research Approach.....	48
Interpretive Stance.....	48
Considerations of Trustworthiness.....	49
Instructional Setting.....	50
Setting.....	50
Subject Selection.....	52
Implementation Phases.....	54
Phase 1:Introduction.....	55
Development of regulatory skill.....	55
Pedagogical reasoning.....	57
Phase 2: Development.....	58
Observation.....	60
Emulation.....	61
Self-Control.....	62
Self-Regulation.....	63
Phase 3: Conclusion.....	64

Data Collection and Analysis.....	65
Data Analysis	67
Types of Pedagogical Decisions	68
Knowledge Sources	69
Developmental Levels	70
Connections.....	70
Summary	71
CHAPTER V: FINDINGS.....	72
Pedagogical Decisions	73
General Instructional Goals	73
Specific Instructional Goals	74
Using Informal Assessment	75
Gathering Informal Assessment.....	76
Long-term Literacy Goals.....	77
Motivation and Affect.....	78
Classroom Management.....	78
Sharing Ownership.....	79
Pedagogical Decisions Across Self-Regulatory Stages	80
Sources of Teacher Knowledge	83
Knowledge Sources across Self-Regulatory Stages	84
Using Knowledge Sources to Make Decisions	88
Summary	91

CHAPTER VI: DISCUSSION	93
Juggling Priorities: Pre-service Teacher Decisions	94
Decision Frequency by Stage.....	95
Types of Decisions by Stage.....	95
Managing Resources: Accessing Knowledge Sources to Make Decisions	97
Theoretical Knowledge	97
Practical Knowledge	98
Moral Knowledge	99
Seeking Learning Opportunities: Directions for Future Research.....	100
Taking Action: Policy Implications	103
REFERENCES	104

LIST OF TABLES

TABLE		PAGE
1	Implementation Phases	54
2	Instructional Sequence and Indicators of Regulatory Skill Level	59
3	Reflective Questions by Instructional Stage	60
4	Data Collection throughout the Instructional Sequence	66
5	Pedagogical Decisions by Stage	81
6	Knowledge Sources by Stage.....	85
7	Knowledge Sources by Type of Decision.....	89
8	Combined Model for Teacher Preparation	102

CHAPTER I

MEETING SAM

It was May; the school year was coming to a close. I checked my e-mail as I did at least 20 times each day and found the message that would change the course of my career. I had been teaching for seven years and had become quite comfortable in my role. Comfortable enough to volunteer to host my first student teacher in hopes that I could share some of the expertise I had gained and give back to my chosen profession. Comfortable enough to challenge the status quo and question my administrators when a decision they made did not align with my beliefs and philosophy. I had even started to think that I could teach in this small town for the remainder of my career. But, everything changed with one click of the mouse, in the heat of this almost-summer day.

The message was simple enough, it was from the school's principal and it was sent to all teachers who taught first grade students. She used a few more words, but the heart of the message was, "Who would be willing to teach Sam?" (all names are pseudonyms). I remember staring at the message for a long time with a mixture of emotions. I had never been asked such a question before and she had been principal for six of my seven years at this school. Several thoughts passed through my mind; it would be a lot of work, thank you for asking, am I equipped to teach this student?, what happens if we all say 'no'? As I often did at times such as this, I walked next door to the classroom of my partner teacher, Pam.

As I entered Pam's classroom, the first words from her mouth were, "Did you see the e-mail?" We were commonly on exactly the same page so I half expected to be

welcomed with this question. I was instead taken back by her next words, “Well, I’ve worked with the family before and I’m not taking him.” I was simultaneously disappointed by these words and understanding of her position. As teachers, our jobs are difficult on a good day. She had worked with many students who presented challenges both academically and behaviorally. I knew her to approach these situations both professionally and effectively, putting the child’s needs first in the equation. Perhaps it is good that she was willing to admit that this would be too much for her. But how can we deny our responsibility to educate the students who walk through our doors? Who are we to value one child over another?

In a moment of passion, I walked to the principal’s office and found that she was not already meeting with someone else. This was an atypical finding so I took advantage of the opportunity. I entered her office, and asked to close the door. I expressed to her that I was uncomfortable that we were given the option to refuse a student and that I felt that he should be assigned to the teacher who would be best able to teach him, as we do for all other students. It was true that this particular student had special needs, but that was also true of an increasing portion of our population.

While her e-mail message was phrased positively, the implicit message is that we have the option of saying ‘no’ as Pam planned to do. I appreciated that our principal considered the needs of the teachers in her building, but I strongly believed that being able to choose which students we taught contradicted the mission and values of our school, and everything I stood for as a teacher. As we talked it became clear that I was not going to prompt her to change her approach, and in hindsight perhaps she had

designed this situation more artfully than I had seen at the time. By taking a stand and fighting for this student I had unintentionally revealed myself as Sam's teacher for the next two years.

At the end of May, we had a meeting to discuss what it would mean to have Sam join my classroom. Due to the nature of his disability, and the fact that there were no academic goals in his IEP, Sam was not assigned to a special educator in the building. However, he came with a computer, scanner, and printer set-up that would occupy the corner of my classroom. He would be accompanied by a teacher's aide who would be responsible for adapting his materials and making sure that he maneuvered through the school building safely. Before the school day began he would meet with his specialist for an hour in my classroom so he did not miss critical components of my instruction. And, perhaps the most difficult for me, all of the teaching materials needed to be ordered by the first of June so they could be sent away for translation.

Sam was an energetic young man who enjoyed many of the same activities as his classmates. He loved to run, play and make lots of noise. He enjoyed making messes, but not cleaning them up. He had an amazing memory and could recite back the news reports from the previous evening word-for-word. Each summer he went to camp where he participated in sports and games with his peers. In most ways Sam was no different than the rest of his classmates, except Sam was blind. He had a bit of light perception in one eye and it was suspected that he could perceive some movement. Even the doctors were not certain how much he could see because he so competently used the language of sight that it was difficult to determine his true capabilities. On the playground he would play

hide-and-seek with the kindergarten students, frequently telling them to 'hide good so he could not see them.' To this day, we don't think that this was intended to be a joke.

Juggling Priorities

Sam came to me as a Braille reader. He could identify letters by swiftly moving his fingers across the page and say the words that were represented. At the beginning of first grade he was able to identify 80 correct words per minute on second grade level material. According to the standards, this well surpassed the expectations in place. While I was teaching his first grade peers to match letters and sounds, I did not have to do this for Sam. He worked with a Teacher for the Visually Impaired (TVI) and it was her job to make sure that he developed the skills necessary for decoding and coding Braille. She worked with him for an hour each morning to develop his fluency in Braille and computing skills.

When Sam was asked to retell a text, he would echo back nearly every word of the text as though someone had pressed rewind on a tape recorder. By many definitions, Reading would be considered an area of strength for Sam. However, when Sam was asked a question about what he had read, he would rerun the text in his mind and stop when he reached the answer. This technique worked fairly well, albeit very inefficient, for literal questions that were directly answered within the text. If a response required him to work with ideas in the text and combine with background knowledge to make an inference, Sam was not able to respond or responded with a direct quotation. Additionally, when he came to a word he did not automatically recognize, or if it was a word represented by a specific symbol (some words in Braille are abbreviated differently

and are somewhat akin to sight words in print) he relied on his TVI to provide him with the word rather than using the context to make an attempt. Sam did not have a bank of strategies to draw from and this created a situation where he was a dependent learner rather than developing reading skill through experience and practice reading.

It was clear to me that Sam had not yet constructed an effective system of reading strategies. However, he had attained a level of skill that satisfied both his IEP and the district's standards for first grade students. If I had decided at this moment to allow Sam to continue down the literacy path he had established, there would be no sanction for me as his teacher. I would have done my job and my student would have been proficient. To act differently would require more effort and more creativity on my part. It also would require treating one student differently than another so that each may achieve the success that he or she deserves. Juggling these priorities required a particular moral disposition toward teaching and it is possible that another teacher for another student in a different setting may have chosen differently. In this context, I chose to act by seeking other instructional options for Sam.

Managing Resources

Initially, I could only see my lack of resources. I discussed my observations with Sam's TVI and she agreed with my observation but had no instructional suggestions for me. She had only been taught how to teach him the code and build fluency with that code. Her practices and curricula were built on the common assumption that students will comprehend if they are able to read fluently. Due to the nature of his disability, and the fact that there were no academic goals in his IEP, Sam was not assigned to a special

educator in the building. I was solely responsible for his academic program. I had never observed a Braille reader in the classroom and had no model to draw upon beyond my observations of his TVI who already admitted the limits to her own understanding.

At some point, after much contemplation and many sleepless nights, it occurred to me that while I had not learned about reading theory as it relates to Braille readers, I was the individual in this scenario with expertise in the area of literacy development. While there were obvious difference between the ways in which blind and sighted children learned to read, there also had to be a great deal of similarity.

We had recently adopted a new vocabulary program aimed at improving the reading comprehension of young readers by helping them interact with the ideas and concepts represented by the words in the text. The program called for teachers to read a story aloud several times and guide students to interact with the vocabulary through multiple modalities. We used pictures to help students visualize the words, we acted out the words (making faces for emotions, etc.) and we played word games where students selected the appropriate word for various situations.

Seeking Learning Opportunities

After mining through my current knowledge, I sat down to review research on reading comprehension difficulties and found that when fluency is in place gaps in oral language and vocabulary can be a potential cause. According to Coulter (1966), vocabulary represents a concept which is “the product of a mental act which assigns meaning or image to objects and verbal symbols,” (p. 490). For a child to attain and define a concept they must experience an object, assign a mental representation to that

object, link a word with that object, and store that connection mentally. It was at this point that I was able to identify what I did not know, and absolutely needed to know before I could make effective instructional decisions for Sam. I needed to understand how he would be able to perceive and develop a mental representation for the words that he read.

The mental representations of blind children consisted mostly of tactile information (Knauff & May, 2006). This created a theoretical problem for students with visual impairments being taught in curricula designed for sighted children. The pictures used in the curriculum held no meaning for Sam. His aide had tried to describe the pictures for him as she did when he entered a new location for the first time. This followed the recommendations we were given, but I doubted the effectiveness of this practice. He acted out some of the words with us when his aide moved his arms to show him the actions we were making, but most of these actions often reflected a visualization of the term or connected to the printed letters (which would be very different in Braille).

Sam learned about the world through his sense of touch; these were the experiences that would be meaningful to him. This is why he could read the words, but not interact with the meaning. We had not found a way for him to access the meaning in a way that he could understand. I had to place myself in Sam's world and how he could come to understand the meaning of these words.

Taking Action

I found a soft blanket to represent the feeling you get when you are 'drowsy' and piece of cellophane that made a terrible crinkling sound between your hands to

emphasize the uncomfortable feeling you may have if you were ‘fretting’ about something. I placed them into my school bag with other equally representative items for the other three words I needed to teach. With this idea assembled I was able to go back to bed for a few hours before my alarm clock woke me again for the day.

When I arrived at school, Sam was in the room working with his TVI. I quickly described the plan to her to receive confirmation that my musings seemed appropriate. When it was time to introduce the book I made sure that Sam was seated in the front row, close enough that I could hand him the objects as I explained the words to the class. He explored each object and connected the meaning of the words to the representation. On the second day, I gave Sam the objects and asked him to hold up the appropriate object as the other students matched the pictures with the words that I announced. He was able to match the words and explain the connection easily. By the end of the week, not only could Sam use the words in sentences and explain their meanings, but he was able to use the objects to retell the main points of the story in his own words. While I knew this would not be the end of Sam’s challenges, it was certainly a new beginning.

CHAPTER II

FINDING MEANING IN THE NARRATIVE

As I reflect on my career as a classroom teacher, this particular case continues to emerge as a high point. Students like Sam are the ones that keep teachers awake at night and inspire us to continually add to our instructional repertoire. I have many stories that could be shared and many students who have touched my heart. However, the experiences I shared with Sam stand out among the others. These experiences show that I had not just learned *to* teach, I had learned *from* teaching. I had reached a point where I not only could follow the recommendations of a curriculum; I was able to create instructional solutions where none had previously existed. Corno and Kanfer (1993) assert that in every context there are self-regulated individuals who persist in difficult situations while juggling priorities, managing resources, and seeking learning opportunities. Just as I had desired to build a set of self-regulated strategies for Sam, I had realized that teachers also need to develop their own self-regulation.

Juggling Priorities: Self-Regulation

Self-regulation is a process through which individuals orient thoughts, feelings and behaviors toward goal attainment (Zimmerman, 2000; 2002). Self-regulated individuals are able to place the immediate circumstances within the context of larger or longer-term goals (Baumeister & Heatherton, 1996). At times, this requires an individual to suppress their desire for immediate gratification in exchange for the possibility of longer term results.

In my experiences with Sam, it would have been possible to claim that the instruction being provided was sufficient. He had achieved the reading standard for first-grade students. According to district policy, he was considered to be a proficient reader and did not qualify for additional intervention in literacy. I was not satisfied with this short-term result; I could envision the challenges that would face Sam as the expectations increased. It was in this larger context that I saw the need to make an instructional change for Sam. The scenario presented chronicles my process of clarifying my goal orientation, mining through prior, related knowledge and developing a plan.

According to Zimmerman (1998, 2000) this is the first stage of a dynamic, cyclical process consisting of three phases; *forethought, performance and self-reflection*. During the initial phase, an individual activates prior knowledge and formulates a plan for action including expected outcomes. The next phase is *performance* where the individual engages in the desired task while utilizing both self-control and self-observation. During *self-reflection* the individual makes judgments about their performance. Inappropriate, misguided or inconsistent standards can hinder self-regulation. While the cyclical nature of Zimmerman's model does not indicate clear boundaries to self-regulated activity and new cycles begin where others end, some *forethought* is necessary for new action. Engaging in this process requires certain environmental, motivational and cognitive conditions (Ertmer & Newby, 1996). The individual must have a level of autonomy that allows for freedom in decision making, a specific goal or criterion orientation, and sufficient background knowledge to allow for active construction of knowledge (Pintrich, 2004).

First, the responsibility for finding a solution for Sam's instruction rested clearly in my hands. I was not working within a rigid curricular model or restrictive teaching environment. While instructional freedom was provided, the overarching goal for all teaching in my school was to find appropriate instructional techniques that allow all students to move toward established standards. While I did not have a repertoire of teaching strategies specific to Sam's needs, I had acquired a great deal of practical experience working with other students who struggled to acquire the reading process. I had also developed an understanding of various reading theories that could apply to this situation. Finally, and perhaps most importantly, I was fueled by my moral and ethical obligation to act in the best interest of my students.

Managing Resources: Pedagogical Reasoning

Shulman (1986; 2006) proposed that teachers draw from three distinct types of knowledge (theoretical, practical and moral) that serve as our standards of practice in teaching. Teachers combine these sources of information in order to reflect or reason pedagogically. *Theoretical knowledge* is generalized from empirical research and suggests what may be true universally. *Practical knowledge* reflects a teacher's experiences (both as a teacher and learner) and often pertains to aspects of teaching that may never be examined by research. *Moral knowledge* emerges from the teacher's or society's ethical stance and pertains to actions that are 'right' or 'just' when compared to established standards of humanity. Pedagogical reasoning provides the tools for teachers to favor one source of knowledge over another (Nilsson, 2009; Shulman, 1986). This type of pedagogical reasoning is often facilitated through critical reflection (Shulman, 2002).

As Sam's teacher, I was faced with a problem that I was not directly prepared to solve, one that could not have been anticipated in my initial preparation or the professional development which followed. However, what I had been prepared with was a deep theoretical construct of reading acquisition that included the use of multiple sources of information to interpret and make meaning from a text. I also had practical knowledge of many instructional strategies and had experienced the powerful interaction that occurs when the appropriate instructional strategies are presented to a student in need. This encouraged me to continue searching for the appropriate intervention for Sam. My search was further fueled by a moral and ethical obligation to go beyond what was provided to me and innovate for the benefit of my students. Not only did this moral stand push me to continue pressing forward, it kept me up at night when I could not meet the challenge. In many ways it would have been simpler to utilize the lack of theory and experience to justify instructional complacency and not seek further solutions to this problem. However, it would not have been 'right' in light of my moral compass.

Seeking Learning Opportunities: Teacher Education

The experience of teaching Sam, as well as several others with similarly complex stories, helped me to recognize the teaching expertise that I had gained throughout my career. I recognized that I had knowledge about teaching that I could share with others and I eventually transitioned into my current role as teacher-educator. When I first imagined what it would mean to teach teachers, I envisioned sharing what I had done in my classroom so that my students could in turn do what I did. Over time, my vision of teacher education changed as well as my perceived goals. I did not hope my students

would be the teacher that I had become. I hoped that they would all have the opportunity to teach a Sam; a student who would challenge their practice and the strength of their convictions. And I hoped that they would be prepared to learn from the experience.

Teacher education has come under recent scrutiny with many asserting that the skills taught in teacher preparation do not transfer to practice (Korthagen, 2010; Stigler & Thompson, 2009). The amount of knowledge that these new teachers require in order to successfully negotiate the tasks of teaching can be overwhelming. Some assert that we must embrace the fact that no teacher will be fully prepared after initial preparation (Bartell, 1995; Dalton & Moir, 1996). As teacher educators, this perspective both limits and expands the scope of the initial teacher preparation program's impact. Others suggest that a major responsibility for teacher educators should be to establish foundational skills, knowledge and dispositions that would prepare a teacher to learn from continued practice (Ball & Cohen, 1999; Duffy, 2005; Feiman-Nemser, 2001).

In an increasingly growing portion of the country the doubts related to the effectiveness of teacher preparation has led to the application of standardized assessment practices and accountability similar to that which K-12 systems already encounter. When placed in relation to the development of self-regulation, rigid and outcome-focused systems can actually arrest the development of self-regulation (Zimmerman & Kitsantas, 1999). A strict outcome focus that is controlled by external entities changes the teacher's focus from process related issues of practice and limits teachers' autonomy for decision making. I believe this to be a counter-productive system that must be challenged in order to promote real change in teacher preparation.

If teacher preparation programs can create conditions where pre-service teachers become self-regulated in their ability to learn from practice, where the teacher “who appears to be working alone is not thinking alone” (Pressley, 1995, p. 210), the effects of initial preparation can be expanded throughout a teacher’s career rather than diminished. Teacher preparation programs based on a construct of self-regulated teaching would develop the cognitive and motivational factors necessary for self-regulation within teacher candidates. They would also scaffold the development of self-regulatory behaviors within authentic contexts. However, this development could be arrested if supportive environmental factors are not present within their initial teaching assignments.

Taking Action: Purpose of the Study

The purpose of this study was to examine the cognitive and motivational factors related to the development of self-regulated teaching. These factors were defined by Shulman (1986; 2006) as theoretical, practical and moral knowledge for pedagogical reasoning. This study occurred in a clinical, instructional setting specifically designed to provide pre-service teachers with the environmental factors necessary to support the development of self-regulated instructional decision making. These factors included specific modeling of teacher thinking, regular formative feedback, instructional autonomy and strategic reflection. An instructional sequence based on Schunk and Zimmerman’s (1998; 2007) Model of the Development of Self-Regulatory Skill was applied which allowed pre-service teachers opportunities to observe, emulate, control and self-regulate teaching decisions.

Schunk and Zimmerman (1998, 2007) developed the Social Cognitive Model of the Development of Self-Regulatory reflecting four stages of development. They are: *observation*, *emulation*, *self-control* and *self-regulation*. During the first two stages the learner is dependent on a more knowledgeable individual who can provide modeling and feedback. Initial awareness of a skill is developed through the *observation* of others and the identification of key features of implementation. Once students are able to identify the strategic process modeled by others, they begin to *emulate* the process independently making gradual progress toward successful implementation. After each attempt the learner receives social feedback for continued improvement.

Gradually the learner begins to take more control of the skill and becomes capable of both performing and critiquing their performance simultaneously. During the third stage, students show *self-control* of the process and are able to recognize the need and implement a process without direct modeling. At the highest stage, students are able to apply a process flexibly and make adjustments to fit the situation as needed. It is at this point they have reached *self-regulation*. In order for pre-service teachers to move from the first level of *observation* to the fourth level of *self-regulation*, they must reflect on their own practice and that of other professionals (Zimmerman, 2002).

Applying the construct of self-regulation to a teacher education setting, one must first consider that it may be possible that some pre-service teachers may never achieve self-regulation during their undergraduate education. As Pressley (1995) suggests, teaching requires a complex network of knowledge and skill acquired through a “long-term developmental process, occurring over years and decades, with real expertise in

academic cognition not something likely in undergraduates” (p.207). However, if we are able to begin the process of development using the first two stages of Schunk and Zimmerman’s (1998; 2007) model, when learners are more dependent on external modeling and feedback, it is more likely that they will continue to develop these skills on their own (Schunk & Usher, 2013).

This study occurred in a clinical, instructional setting specifically designed to support the development of self-regulated decision making for pre-service teachers. Interpretive content analysis was used to examine the nature and intentionality of pre-service teachers’ pedagogical reasoning while planning and implementing reading instruction for elementary students. Specifically, this study sought to address the following questions:

1. What types of pedagogical decisions do pre-service teachers recognize in their own practice and the practice of others?
2. How do pre-service teachers apply theoretical, practical and moral knowledge when *observing* the professional practice of others?
3. How do pre-service teachers apply theoretical, practical and moral knowledge when *emulating* the professional practice of others?
4. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-control* in their own professional practice?
5. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-regulation* in their own professional practice?

CHAPTER III

REVIEW OF RELATED LITERATURE

Teacher education has come under recent scrutiny with many (Korthagen, 2010; Stigler & Thompson, 2009) asserting that the skills taught in teacher preparation programs do not transfer to practice. While newly licensed teachers demonstrate a required knowledge base, they struggle to apply this knowledge in real contexts. Some (Bartell, 1995; Dalton & Moir, 1996) suggest that we must embrace the fact that no teacher will be fully prepared after initial preparation. Accepting this does not negate the value of teacher education but rather it changes its purpose and outcomes.

If teachers must both teach and learn to teach (Feiman-Nemser, 2001) during their first years, then the outcome of teacher education should be to prepare teachers to learn as a teacher. Teacher educators can assure that pre-service teachers establish foundational skills, knowledge and dispositions that would prepare novice teachers to learn from continued practice (Ball & Cohen, 1999; Duffy, 2005; Feiman-Nemser, 2001). Pre-service experiences should be educative (Dewey, 1938) making possible new learning that is deeper and more refined. This would require professional reflection focused on critical attributes because, “only by extracting the full meaning of each present experience are we prepared for doing the same thing in the future” (Dewey, 1938, p. 49).

Interpreting daily classroom experiences can be challenging for pre-service teachers because the act of teaching is inherently complex, consisting of countless interactions between numerous individuals (Lampert, 2001; Shulman, 2005). Spillane, Reiser, and Reimer (2002) point out that while there are few consistencies in the day to

day operations of teaching the one pervasive feature is that teaching is comprised of “unpredictable human relations not reducible to programmatic routines” (p. 390).

Teachers must analyze each teaching situation with a goal focus, select appropriate actions and monitor the impact of these actions through reflection. In order for teachers to innovate, or adapt, they must learn to access the appropriate knowledge and implement this knowledge in a way that fits specific students in particular circumstances (Ball & Cohen, 1999; Duffy, 2005). These decisions are informed by standards of practice, including those that are widely accepted and those formulated by the individual (Baumeister & Heatherton, 1996). Shulman (1986) described the process through which teachers make daily complex decisions as pedagogical reasoning, setting it apart from other types of context-specific problem-solving processes.

According to Shulman (1986; 2006), teachers draw from three distinct types of knowledge (theoretical, practical and moral) which become the standards of practice accessed during reflection or pedagogical reasoning. Theoretical knowledge is gained through empirical research, practical knowledge is built through personal experience and moral knowledge is grounded in an individual’s ethical belief of what is inherently ‘right’ or ‘just.’ Jay (2002) found qualitative differences between expert and novice teachers in the area of pedagogical reasoning. These findings parallel other models of teacher development (Evans, 2002; Snow, Griffin & Burns, 2005) that reflect a gradual progression from static and situated pedagogical knowledge to a more adaptive and flexible stance toward pedagogy.

Schunk and Zimmerman (1997; Schunk, 2001; Zimmerman, 2002) defined a similar developmental progression in the acquisition of self-regulatory skill. They propose that self-regulatory skill can be developed in others through a progression of observation, emulation, self-control and self-regulation (Zimmerman, 2000). This socio-cognitive model reflects both the internal and external processes impacting the learner. If indeed, the progression of a developing teacher is parallel to the model for development of self-regulatory skill, this model can then inform teacher educators and staff developers as they work to develop pedagogical reasoning in the pre-service and in-service teachers they serve. The following review will discuss current and past research in the areas of self-regulation, pedagogical reasoning and their application to the study of pre-service teacher development.

Pedagogical Reasoning

For decades, educational researchers have sought a definition for effective teaching with no clear consensus (Goldhaber & Anthony, 2007; Good, Wiley & Florez, 2009). Instructional strategies that impact students positively in some situations can have a negative effect in other situations (Marzano, 2003). Additionally, significant effect sizes have been found for individual teacher differences that cannot be explained by differences in instructional practices (Nye, Konstantopoulos, & Hedges, 2004). Many have viewed this condition as problematic to the profession (Goldhaber & Anthony, 2007) while others view it as an indication of the complex nature of the act of teaching (Marzano, 2009).

Many (Ball & Cohen, 1999; Sawyer, 2004) assert that effective teaching must be adaptive. This quality has been called “adaptive metacognition” (Lin, Schwartz, & Hatano, 2005), “thoughtfully adaptive” teaching (Duffy, 2005), or “adaptive expertise” (Bransford, Darling-Hammond, & LePage, 2005). Teachers who possess this quality, independent of the name, are able to use curricular tools and apply their professional knowledge flexibly to fit the “particular students interacting with particular ideas in particular circumstances” (Ball & Cohen, 1999, p. 10). In order for teachers to innovate, or adapt, they must learn to access the appropriate knowledge and implement this knowledge in a way that fits specific students in particular circumstances (Ball & Cohen, 1999; Duffy, 2005). This process has been referred to as *Pedagogical Reasoning* (Shulman, 1986; 2006).

Shulman (1986; 2006) proposed that teachers draw from three distinct sources of knowledge (theoretical, practical and moral) in order to reflect or reason pedagogically. *Theoretical knowledge* is generalized from empirical research and suggests what may be true universally. *Practical knowledge* reflects a teacher’s experiences (both as a teacher and learner) and often pertains to aspects of teaching that may never be examined by research. *Moral knowledge* emerges from the teacher’s or society’s ethical stance and pertains to actions that are ‘right’ or ‘just’ when compared to established standards of humanity. These knowledge sources collectively inform a teacher’s knowledge base in a variety of domains pertaining to the acts of teaching including but not limited to; content knowledge, pedagogical knowledge, curriculum knowledge, knowledge of students, knowledge of school values and goals. Teachers will encounter situations where

knowledge from different sources and/or domains are in conflict; at this point pedagogical reasoning must be employed (Nilsson, 2009; Shulman, 1986). Pedagogical reasoning provides the tools for teachers to favor one source of knowledge over another in light of the particular context or situation.

Theoretical Knowledge

The proper placing of theory within the teacher education structure has been the sources of much debate (VanderVen, 2009). Shulman (1986) includes theory, developed from empirical research, as an important source of teacher knowledge but not the singular or primary source. Practicing teachers have provided the impression that once teacher preparation is complete, theory loses its value in favor of practical applications. Clark and Peterson (1986) claimed that teacher knowledge is atheoretical in nature supported by others who have characterized teacher knowledge as highly contextualized (Leinhardt, 1990) and difficult to transfer (Korthagen & Kessels, 1999). Others propose that the divide between theory and practice is artificial and simply represent two ways to communicate professional knowledge (Schön, 1983).

Theoretical knowledge, in the form of research-based practice, has received great attention in recent educational policy. Researchers such as Marzano, Pickering, and Pollock (2001) have reported sets of *high-yield strategies* supported by research. These practices have been interpreted by some to be a comprehensive list of strategies that would be applicable in all situations. Marzano (2009) himself characterized this interpretation as a mistake that “can impede the development of effective teaching in classrooms across the country” (p. 31). He goes on to state that a narrow view of effective

instruction does not enhance pedagogical expertise and may be in direct opposition to reflective practice.

Kane, Taylor, Tyler, and Wooten (2011) conducted structured observations of instructional practices and compared results to students' scores on the standardized state achievement test. Eight standards were selected for observation across two teaching domains; Learning Environments and Teaching for Learning. Each standard was evaluated using a four point rubric and all rubric scores were totaled to determine an overall score. Results indicated that certain instructional practices seem to predict higher achievement in some content areas, with the largest correlation found in the area of mathematics. Similar to Marzano, researchers caution against the application of these findings as rigid mandates because the peripheral impacts have not been examined (Kane et al., 2011). While a positive impact was found for some students in some subjects, the generalizability of these strategies has yet to be determined. Additionally, the standards represented general descriptors such as, "implements effective routines" and "engages in discourse" rather than specific instructional practices. Taken together, the literature on teacher theoretical knowledge indicates that theory is an important knowledge source for teaching, but is most powerful when combined with practical knowledge of how, when and where the theory can be applied.

Harste, Leland, Schmidt, Vasquez and Ociepka (2004) studied the impact that theoretical knowledge had on the practices of pre-service teachers. Observations were conducted with 16 junior-level teaching students participating in an integrated teacher education program directly linking theory and practice. Post-observation interviews were

also used to access the pre-service teachers' pedagogical reasoning and to determine the role theory played in their teaching decisions. Inter-contextual analysis was used to identify patterns in pre-service teachers' reflections. Researchers organized responses into a taxonomy of five 'stances,' each representing a different lens through which the experience could be viewed (theory, reflection, curriculum, social justice, and world view). Based on the analysis of this data, it was concluded that those "who can theoretically justify their practice are much more likely to accomplish change" (Harste et al., 2004, para. 5). Pre-service teachers who were able to link their practices to learning theory were most able to adapt curricular models and impact student achievement. The application of theory occurred either while planning for instruction or after implementation as a means of reflection. In some cases, the presentation of theory after practical experience prompted additional reflection within the pre-service teachers and moved the intern into a critical perspective. Harste et al. concluded that theory and practice evolve together and are complementary in the development of pre-service teachers. However, limits on time can constrain the development of sound theory-practice connections.

Practical Knowledge

Practical knowledge for teaching is built through direct experience in teaching and learning environments (Shulman, 1986). Experiential learning has long been a standard part of teacher preparation. Dewey (1938) hails experience as vital to learning provided the experiences are educative and learners "know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have

to contribute to building up experiences that are worthwhile” (p. 40). Early field experiences often focus on observation of the classroom environment and pre-service teachers become increasingly involved in the classroom through student teaching (Hagger, Burn, Mutton & Brindley, 2008). However, the experiences that pre-service teachers encounter during their teacher preparation compose only part of a teacher’s experiences in schools (Lortie, 1975).

In Lortie’s (1975) seminal sociological study he discussed the impact that a teacher’s own experience as a learner can have on her future teaching. Lortie coined the phrase “apprenticeship of observation” to describe the 13 years pre-service teachers spent in school as students. The “apprenticeship” is limited in its ability to accurately inform a new teachers practice in two important ways. First, the student only observes the teacher from his own vantage point. As a student, one is not privy to the private interactions held with other students or how other students view the actions of the teacher given their own personal vantage point. Second, the student is only able to observe the overt actions of the teacher rather than the internal reasoning processes enacted. In order to develop a full understanding of the teaching event the observer, as Dewey (1904) states, must be enabled to “observe with reference to seeing the interaction of mind, to see how teacher and pupil react to each other, how mind answers to mind” (p. 19). The experience pre-service teachers bring to their preparation can be problematic because they may overestimate the depth of their knowledge or they may hold inaccurate perceptions about teaching that can interfere with their development as teachers.

If pre-service teachers are to learn from classroom experiences, it is critical that teacher educators structure experiences in a way that is educative (Dewey, 1938). This includes providing structures that help pre-service teachers attend to the most critical aspects of classroom interactions, assign meaning to these interactions through reflection and develop an action plan for future learning. Darling-Hammond, Hammerness, Grossman, Rust, and Shulman (2005) outline seven qualities of successful clinical experiences for teacher education students; *clarity* of goals, *modeling* where teacher thinking is visible, opportunities for *practice*, formative *feedback* and coaching, *connection* between classroom work and coursework, graduated *responsibility*, and opportunities to *reflect*. In such a model, not only are the overt practices of teaching made more accessible but pre-service teachers also are more able to access the teacher thinking behind these practices. This is important because “the intuitive nature of experienced teachers’ practice means that their learning depends on their bringing to consciousness the taken-for-granted beliefs and considerations embedded in their practice” (Hagger et al., 2008).

Hagger et al. (2008) conducted a one-year longitudinal study in which they followed 25 student teachers participating in a school-based post-baccalaureate teacher preparation program. Three semi-structured post-lesson interviews were conducted with each pre-service teacher over the course of one year. Pre-service teachers were asked to discuss their thinking related to planning, conducting and evaluating a teaching experience. Additionally, they were asked to discuss the sources of their ideas for teaching. Interview transcripts were analyzed for emergent themes and 11 sources of

teaching ideas were identified. While pre-service teachers identified classroom experiences as the most common source of learning, the lessons learned from this experience varied greatly among participants. This variance may be due to pre-service teachers' prior experiences, the type of modeling they are receiving, or the connection to content courses they are taking in conjunction with the experience (Darling-Hammond et al., 2005).

In order to assist pre-service teachers in utilizing their experiences appropriately, teacher educators must acknowledge and address the existing knowledge base of their students. Mallette, Kile, Smith, McKinney and Readence (2000) investigated the beliefs pre-service teachers held about struggling readers before and after a clinical field experience in reading using a multiple case study approach. Written assignments, notes from class discussions and instructor comments were gathered and analyzed for six individual pre-service teachers participating in the study. Throughout the study, the views held by pre-service teachers moved from their initial deficit view of struggling readers to a view that supported a teacher's responsibility to provide appropriate instruction. While each pre-service teacher held a slightly different conception of struggling readers by the end of the semester, each accepted the importance of assessment guided instruction suited to an individual student's needs. This study suggests that teacher educators divorce themselves from the notion that pre-service teachers will either enter or leave preparation programs with the same set of experiences and beliefs. Rather, similar to these pre-service teachers, we should accept the knowledge they have and find ways to utilize it as they move toward an established set of goals.

Moral Knowledge

Consideration for the moral aspects of teaching in educational literature is both relatively new (Akbari & Tajik, 2012) and time tested (Fenstermacher, Osguthorpe & Sanger, 2009; Noddings, 1992). Some shy away from the issue due to confusion between teaching morality and morally teaching (Fenstermacher et al., 2009). To teach morality is to teach others what is right or just, teaching morally means to teach in a way that is right and just. The latter is the focus taken within this review. Ball and Wilson (1996) defined the aspects of teaching morally as twofold combining intellectual honesty with respect, responsiveness and responsibility to individual students. This definition is in line with Fenstermacher (1990) who states:

Nearly everything that a teacher does while in contact with students carries moral weight. Every response to a question, every assignment handed out, every discussion on issues, every resolution of a dispute, every grade given to a student carries with it the moral character of the teacher. This moral character can be thought of as the manner of the teacher. (p. 134)

Shulman (1986) includes moral knowledge as one of the sources of teacher knowledge used during pedagogical reasoning. Moral knowledge for teaching is comprised of an interaction between values, beliefs about students, and an individual teacher's ethical approach to the profession that guides the definition of what it means to act in the best interest of students (Ball & Wilson, 1996; Shulman, 1986). The application of moral knowledge for teaching involves more than belief systems, it is manifested in the actions driven by these beliefs (Noddings, 1992). A teacher is not able to teach from only a moral stance. It is necessary to combine their theoretical and practical knowledge in this action (Ball & Wilson, 1996). The way in which a teacher combines these

knowledge sources into action is determined by their moral stance (Shulman, 1986).

When called to select among two or more options, the teacher's belief system will either explicitly or implicitly drive the decision.

Ball and Wilson (1996) examined the moral dimensions of teaching practice by providing two case-studies of third grade teachers. Each case-study is built as an episode in which teachers decided how to respond to students' ideas in either social studies or mathematics. The two episodes illustrate how the moral aspects of teaching could not be considered separately from the intellectual aspects. Moral beliefs impacted "decisions about which ideas and topics to explore with students, the way those ideas would be represented, as well as the substance and style of our interactions with students" (p. 178). In order for the teachers to determine a morally appropriate action, they had to consider the intellectual aspects of the content and their students. Teachers who want to validate the ideas of their students must consider the implications of valuing these ideas. According to Hawkins (1974, as cited in Ball & Wilson, 1996), "respect for students means taking them seriously, as thinkers, as people with lives and interests and thoughts" (p. 185).

Akbari and Tajik (2012) examined the moral knowledge base of experienced and novice second-language teachers. Forty teachers (20 with one to three years of experience and 20 with three to eight years of experience) were interviewed using a stimulated recall technique (Meijer, Verloop & Beijaard, 2002). After teaching a lesson, teachers discussed their actions in a follow-up interview with one of the researchers. Transcriptions of interviews were analyzed and distinct segments were designated as carrying either

pedagogical or moral thought units. After these thought units were identified, they were categorized to show general patterns of thought and the frequency for each type of thought unit was calculated. In total, pedagogical thoughts dominated the teachers' reflections in both groups (5212 pedagogical vs. 1360 moral). However, moral considerations were evident in both groups with a higher percentage of total thought units being categorized as moral for novice teachers (18.5%) as opposed to experienced teachers (15%) though the total number of thought units was less for the novice teachers. Both groups were most concerned with the moral action of valuing student ideas while novice teachers provided more emphasis to students' emotional states which was replaced by the role of teacher as a moral agent in more experienced teachers. This study shows that practicing teachers do consider moral aspects while teaching and that these aspects can be accessed using the stimulated recall technique. However, more research is necessary to determine the aspects of moral teaching most applicable in particular situations or the best ways to develop moral knowledge for teaching.

Development of Pedagogical Reasoning

Developing pedagogical reasoning in pre-service teachers requires that teacher educators apply similar processes to the development of their own instruction (Mallette et al., 2000). Traditional teacher education programs have focused on a theory into practice model (Darling-Hammond et al., 2005) or a practical training model that emphasizes "passive assimilation of knowledge and compliance with experts' recommendations" (Duffy, 2005, p. 300). Neither of these stances would prepare pre-service teachers to approach the complex actions required for effective teaching (Ball & Cohen, 1999;

Bransford et al., 2005). To best understand how to facilitate the development of pedagogical reasoning skills in pre-service teachers, teacher educators must first understand the development of such skills and means for scaffolding their development.

Jay (2002) examined expert-novice differences in the area of pedagogical reasoning in a qualitative case study. Two participants were used, a pre-service teacher completing student teaching and a veteran teacher with 15 years of experience. Both were secondary English teachers. Using a think-aloud technique, participants viewed a videotaped lesson conducted by a third English teacher in private sessions and reported their thoughts at regular intervals. Following the think-aloud, participants answered questions in a clinical interview that explored their responses further. Both participants commented on similar features during the video, but the expert teacher's comments were more interconnected with respect to students, instruction and content. The novice teacher rarely made connections between these elements. Both teachers were able to provide suggestions to improve the lesson viewed. However, the changes suggested by the expert teacher would change the entire lesson format while those of the novice teacher were much subtler. The researcher noted that while many of the responses were similar between the two teachers, it took more prompting and time for the novice teacher to communicate these ideas. This parallels other research indicating that the reasoning of novices is more time-consuming and less efficient (Borko & Livingston, 1989).

Stoiber (1991) studied the pedagogical reasoning around classroom management of 67 pre-service teachers assigned to either a technical, reflective or control condition. Pre-service teachers participated in 10 weekly sessions during their Educational

Psychology course. In the technical condition, participants were provided with prescriptive principles for classroom management. Each week the instructor emphasized techniques for managing student behavior and organizing instruction. In the reflective condition, participants discussed classroom cases and reflected on potential teacher actions using a three phase model of pre-teaching, interactive teaching, and post-teaching. In the control treatment, pre-service teachers were provided with instruction pertaining to educational practices not related specifically to classroom management. Video-stimulated interviews were conducted before and after treatment. Interviews were coded using a categorical rating system including affect, cognition, and learning environment. Each category was rated using a three point scale based on the depth of reasoning provided for participant responses. At the conclusion of the study, a pattern of increased strategic knowledge was found for all aspects of the reflective condition when compared to the technical and control condition. This indicates that when reflection is established as an instructional goal, pedagogical reasoning can be developed within pre-service teachers.

Beyer and Davis (2009) examined the impact of two different types of educative supports provided to pre-service teachers. Fifty-six pre-service teachers enrolled in an elementary science methods course participated in the study. They were divided into two conditions in line with their section assignments for the course. The first condition provided general supports focused on an instructional principle. The second condition provided lesson-specific supports that were centered on an instructional principle, but not explicitly stated as such. Benefits and challenges were noted for both conditions. Students receiving lesson-specific supports were less likely to generalize the instructional principle

to other contexts. This generalization was more apparent in the group receiving general supports. However, this group expressed limited views of the usefulness of the supports due to challenges in applying them to the immediate context. This suggests that pre-service teachers need a combination approach where they are scaffolded as they move from the specific application of principles to more general applications. Additionally, pre-service teachers need opportunities to reflect on their experiences (Stoiber, 1991) and time to plan for instruction that applies best practices to their natural contexts (Jay, 2002).

Self-Regulation

“Self-regulation refers to the process whereby students activate and sustain cognitions, behaviors, and affects that are systematically oriented toward the attainment of goals” (Schunk, 2001, p. 125). The ability to self-regulate is considered by some the most important, uniquely human quality (Zimmerman, 2005). Self-regulated individuals are able to place the immediate circumstances within the context of larger or longer-term goals (Baumeister & Heatherton, 1996). At times, this requires an individual to suppress their desire for immediate gratification in exchange for the possibility of longer term results.

Paris and Winograd (2001) assert that self-regulation is characterized by the interplay between metacognition, strategy use, and situated motivation. Effective self-regulation requires individuals to have clear goals as well as the means and motivation to achieve them. The principles of self-regulation have been applied to a multitude of contexts ranging from acquiring musical skill (McPherson, Nielsen & Renwick, 2013) to managing chronic disease (Clark, 2003). Despite the context, there are self-regulated

individuals who persist in difficult situations while juggling priorities, managing resources, and seeking learning opportunities (Corno & Kanfer, 1993). There are others in the same contexts whose self-regulatory functioning fails (Baumeister & Heatherton, 1996).

Contemporary research in the area of self-regulation is largely based on Bandura's social cognitive theory (1977, 1991, 1997, 2001). Bandura (1997) proposed that human actions occur within a framework of personal, social and environmental factors. Bandura (1991) identified the self-regulatory processes necessary to negotiate these factors *self-monitoring*, *self-judgement*, and *self-reaction*. These processes were believed to be applied separately to learning, motivation and performance. An individual's goal orientation determined the likelihood that an individual would engage in an experience as well as the criteria used to monitor and judge their performances.

Research based on social cognitive theory typically applies a feedback-loop model (Bandura, 1991). The basic premise of this model is that a person's prior experience colors their approach as they engage in a new performance. This prior experience includes the feedback received, either directly from others or from the environment. Reactions to the current performance then become part of the individual's background as they approach future performances. The feedback-loop models of self-regulation are similar to those based on operant conditioning theory (Skinner, 1961) emphasizing performance and reinforcement (Mace, Belifiore, & Hutchinson, 2001). However, the sources of reinforcement within self-regulatory models are primarily intrinsic rather than extrinsic (Zimmerman, 1998).

Development of Self-Regulation

The self-regulatory processes of novices vary greatly from those of experts. Novices tend to rely on the evaluations of others rather than applying an intrinsic evaluation of their own actions (Zimmerman, 2002). Self-regulation can be promoted through mental simulations, promoting student motivation, modifying the classroom environment, and direct instruction of academic strategies (Boekaerts & Corno, 2005). However, “inferences about students’ self-regulatory capability cannot be made if they do not have options available or cannot control an essential dimension of their learning” (Zimmerman, 1994, p. 6). Regardless of the content to be learned, all learners must choose to participate if they are to gain from the learning process. They may also benefit if they can select the method through which they participate, their performance outcomes and social/physical setting to truly achieve self-regulation (Schunk, 2001).

Schunk and Zimmerman (1997; Schunk, 2001; Zimmerman, 2002) proposed a four-phase model for the development of regulatory skill: observation, emulation, self-control and self-regulation. The purpose of this model is to guide the development of social-instructional experiences because, “learning is optimized when the needed form of social instruction is matched to the students’ level of regulatory skill for the task in question” (Schunk & Zimmerman, 1997, p. 37). Schunk and Zimmerman (1997) caution that this model is not meant to classify or limit learners, nor do learners fit into the same phase for all learning events.

Observation. Observation has been identified as a critical learning skill by many (Bandura, 1977; Browder, Schoen, & Lentz, 1986; Stolpe & Bjorklund, 2013) and is the

first phase of Schunk and Zimmerman's (1997) model of regulatory skill development.

“Observational learning can be operationally defined as learning a new response or refining a previous response as a result of observing the behavior of a model” (Browder et al., 1986). Observations can occur naturally during behavior acquisition or can be planned during more intentional forms of instruction (Bandura, 1977). This more intentional, observational learning is often facilitated through teacher modeling.

Modeling is a teaching strategy that has long been recognized as effective in a variety of contexts (Bandura, 1991). Teacher modeling involves the demonstration of a desired skill for students by the teacher. Modeling is effective when learners are able to pattern their behaviors, thoughts, and affect after a more-informed other (Schunk & Zimmerman, 1997). To learn from modeling the learner must attend, code the information, be capable of producing the demonstrated behavior and be motivated to do so (Bandura, 1991). Teachers can support learners' observations by modeling key behaviors and verbalizing their own thoughts and reasons for their actions (Ozdemir & Pape, 2012).

Bjorklund (2007) described two separate, physiologically different memory systems that are activated differently during observation. The first is the *explicit memory system* which processes facts and rules. Explicit definitions and rules are used to search for matching characteristics within the given environment. This relies on short-term, working memory and is limited by cognitive capacity (Marois & Ivanoff, 2005). Applied specifically to observation, this explicit memory allows the observer to focus on specific details but creates a narrow field of vision (Bullier, 2001). Observers must consciously select the focus of attention and constantly change their focus when observing a complex

environment (Stolpe & Bjorklund, 2013). In contrast, the *implicit memory system* detects patterns holistically and associates them with previous, related encounters (Bjorklund, 2007). While observations connected with this type of memory are not subject to the limitations of conscious attention, they are only possible when the individual has acquired sufficient supporting experiences (Stolpe & Bjorklund, 2011).

Observation has been applied to teacher education contexts as both an instructional and assessment tool (Beck, King, & Marshall, 2002). However, the ability to perform quality observations that extend beyond surface procedures is a documented challenge for novice and pre-service teachers (Berliner, 1988). In a classic study, Berliner (1988) demonstrated the differences between novice and expert knowledge about teaching. Additionally, differences were found between those with content expertise (i.e. scientists) and those with teaching expertise (i.e. science teachers). Expert teachers noticed details about the learning event despite the milieu of activity presented to them in teaching videos, both novice teachers and content experts could not identify significant interactions. This was later replicated with similar results (Sabers, Cushing & Berliner, 1991).

Combining Berliner's (1988; Sabers et al., 1991) findings with Bjorklund's (2007) dual-memory theory and applying to the context of teacher education would suggest that pre-service teachers have not yet acquired sufficient experience in teaching situations to detect important details of the situation. Providing a conceptual framework to scaffold observation had been shown to build teaching schema and observational ability in pre-service teachers (Beck et al., 2002). Beck et al. (2002) conducted a study of observation

skills in 62 pre-service teachers at the beginning of their teacher preparation program. Pre-service teachers were participating in their initial practicum experience and were randomly assigned to a treatment group using technology-supported practice in observation (TSPO) or a control group. The TSPO group recorded samples of classroom lessons taught by their mentor teacher. Video case markers were used to identify specific examples of teacher strategies, student learning, teacher-student interactions, student-student interactions, and professional teaching standards. The control group conducted unguided observations in their field experience classroom and their technology work focusing on classroom productivity tools. At the end of the semester, both groups were shown a sample of three videos and were asked to write a written response to each. Responses were coded and analyzed for emerging themes and the total number of responses represented within these themes was calculated. Pre-service teachers in the TSPO group significantly outperformed those in the control group on all three video segments. The researchers asserted that these differences were due to the repeated viewing and analysis of a particular case and the application of specific observational frames. The repeated practice prompted skill development that was transferrable to new teaching situations.

The use of observation in the study of teaching is not only complicated by pre-service teachers' lack of experience in the classroom, it is also complicated by the extensive experience they have had in the classroom prior to entering a teacher education program. Teachers do not only learn to teach from their teacher preparation coursework, they learn from the 13 years they spent as students which Lortie (1975) called the

“apprenticeship of observation.” Because pre-service teachers have navigated through the public school system themselves they have their own cultural vision of successful schooling (Stigler & Stevenson, 1992). Features that define cultural activities are often unnoticed by insiders because their presence is so pervasive and when these cultural norms are not present pre-service teachers can be resistant to accepting these new practices (Stigler & Thompson, 2009).

Emulation. While learners can benefit from watching a model, their learning is limited without the opportunity to perform the task. For this reason, Emulation is the second stage of Schunk and Zimmerman’s (1997) developmental model. During the emulation stage of regulatory skill development, the learner is more active and makes successive attempts to emulate the actions of the teacher (Schunk & Zimmerman, 1997). The learner either emulates the actual actions of the model or the general pattern or style of functioning. Teachers can assist in this stage by providing conditions where the learners can enact these behaviors and provide feedback on the degree of accuracy with which the behaviors were applied (Ozdemir & Pape, 2012).

Huang and Charman (2005) examined the ways in which emulation is discussed in learning research. There is a distinction between the similar terms of emulation, imitation and mimicry. While each of these terms describe a situation where a skill or behavior is modeled and subsequently attempted by an observer there are differing degrees of sophistication within this process. Mimicry is often used to refer to the least sophisticated process of copying the models body movements (Huang & Charman, 2005). Imitation and emulation also can involve replicating a model’s actions, but the

focus of each of these processes is on the goal-orientation and intention of these actions (Tomasello, 2009). During imitation, learners copy the actions of a model for a specific purpose. There are times when learners pursue the same goal purpose but adapt the specific actions of the model. This is known as emulation (Huang & Charman, 2005).

There are many opportunities for emulation within the teacher education context. Teacher education students are exposed to a variety of models ranging from their university professors to their field experience mentors. However, multiple studies have shown that pre-service teachers are more likely to emulate the behaviors of their own teachers or practicum teachers than university faculty (Bullough & Gitlin, 2001; Clift & Brady, 2005). In fact, this has prompted some to question the ability of teacher education to impact the actions of pre-service teachers (Korthagen, 2010). Stigler and Stevenson (1992) postulate that emulation can be subject to filters created by the learner's belief systems or experiences. In order to facilitate change in pre-service teachers actions, these beliefs must first be addressed (Leder, Pehkonen, & Törner, 2002; Mewborn, 2001).

Self-Control. Movement into the self-control level of self-regulatory skill development represents a major shift in the locus of control. During previous stages, the learner was reliant on a teacher for feedback and modeling. At this level of development the learner takes ownership for the selection, implementation and evaluation of their own actions. Learners displaying self-control are able to independently identify goals and the strategic behaviors linked to their attainment (Pintrich, 2004). This shift requires a higher level of independence and an ability to transfer learning to new contexts. The teacher, while less overt, is still present and observes the actions of the learner for the purpose of

providing feedback while adjusting the task or support as the learner encounters difficulty (Ozdemir & Pape, 2012).

Baumeister and Heatherton (1996) identify self-control as a key determinant between self-regulation and self-regulatory failure. Self-control “enables a person to override a habitual or motivated response sequence” (Baumeister & Heatherton, 1996, p. 2). This is especially important when the desired action differs greatly from those observed over a long period of time (Lortie, 1975; Stigler & Thompson, 2009). Three conditions are necessary to facilitate self-control and avoid self-regulation failure. These conditions are standards, monitoring, and operation (Baumeister & Heatherton, 1996). Standards are clear goals or ideals that provide a focus for monitoring and operation. During action, an individual displaying self-control is able to evaluate and judge the success of their actions (Zimmerman, 1998). These judgments are based on the proximity to the established standards. When current actions are not in line with these standards, or goals are not likely to be achieved, the self-controlled individual some change of motion goes into operation. “When attention slips off of long-range goals and high ideals and instead becomes immersed in the immediate situation, self-regulation is in jeopardy,” (Baumeister & Heatherton, 1996, p. 4).

Rich and Hannafin (2008) found that pre-service teachers benefit from structures designed to help them detect contradictions between their belief system, perceived emulation of practice and actual lesson implementation. Using a multiple case-study design, Rich and Hannafin (2008) examined the discrepancies between thoughts and actions of pre-service teachers using video self-reflection. Three pre-service teachers in

the final semester before student teaching participated in the study. Each pre-service teacher planned, implemented and recorded a lesson in their practicum classroom. After teaching, they recorded their impressions of the lesson before viewing their video. Participants then noted differences between their observations of the video and what they recalled from memory. Each pre-service teacher identified elements of the interaction that was not immediately recalled. Results of this study indicate that pre-service teachers may benefit from the use of video as a reflective tool allowing them to attend to more details of their lesson. Similarly, Johnson (1994) suggested that pre-service teachers may not be able to attend to all aspects of teaching while 'in the moment' and this reflective structure may serve valuable. If pre-service teachers are unaware of these discrepancies during implementation, their ability to emulate practice may be complicated.

Self-Regulation. The final stage in Schunk and Zimmerman's (1997) model of self-regulatory development is self-regulation. Self-regulated learners are active and in control of actions as well as their motives, beliefs, cognitions, and intentions. Self-regulated learners persist in difficult situations while juggling priorities, managing resources, and seeking learning opportunities (Corno & Kanfer, 1993). Additionally, self-regulated learners demonstrate the capacity to learn without the direct instruction of others (Schunk & Zimmerman, 1997). This is not to imply that learners are performing in isolation or not interacting with teachers, rather that learners actively seek information, assistance or experience as they identify the need (Paris & Winograd, 2001). "Self-regulated students focus on how they activate, alter, and sustain specific learning practices" (Zimmerman, 2002, p. 70). The teacher monitors behavior for successful

implementation and may challenge students to adapt behaviors to fit varying conditions (Ozdemir & Pape, 2012).

Zimmerman (2005) asserts that there are four dimensions of academic tasks that can become self-regulated. These dimensions equate to the *why*, *how*, *what*, and *where* of learning. Motivation for learning and goal setting define *why* a learner seeks to study particular content. Learners also can regulate the method through which they learn, or *how* they are to learn the content. Performance outcomes can be determined by the learner representing *what* level of learning will be acceptable. Finally, the environment for learning, or *where* learning will take place can also become self-regulated.

The process through which self-regulated learners approach a task has been found to follow a predictable structure (Ozdemir & Pape, 2012; Zimmerman, 2000). When self-regulated learners approach a task they activate prior knowledge and motivational beliefs associated with that task, this phase has been called *forethought* (Zimmerman, 2000). The second phase of self-regulated learning, called *performance*, is where learners engage in the task and apply strategies to mediate their current abilities and understandings. After completing the task, self-regulated learners engage in *reflection* where they self-evaluate their performance and examine their use and application of strategies. This *reflection* then can translate into the next cycle's *forethought* phase if the task is to be completed again. Ozdemir and Pape (2013) propose that within this structure there is also a repeated meta-cycle where learners employ the phases of *forethought*, *performance* and *reflection* within each of the larger phases. In this case the performances, or actions, actually become the mental processes of *forethought*, *performance*, and *reflection*. In this case learners find

themselves preparing to prepare, engaging in the task of performance, and reflecting on the effectiveness of their reflection.

Randi, Corno and Johnson (2011) investigated the self-regulated learning strategies of pre-service teachers. They interviewed 133 pre-service teachers participating in a post-graduate licensure program as they transitioned from their college coursework to their student teaching practicum. Students were asked to describe challenges they encountered during their coursework and strategies they used to overcome these challenges. Responses were coded for challenges identified for the potential of applying self-regulated strategies and patterns were found for overt and covert strategy use. Most challenges identified reflected practical challenges of the program (ex. balancing priorities, time constraints) and the responses included adaptive help seeking, emotion control and positive imagery. One finding reported was that when pre-service teachers were engaged in work that was related directly to classroom teaching they were more likely to persist as they valued the work more highly.

Development of Self-Regulated Teaching

“Self-regulated teachers access knowledge, ‘think-on-their-feet’, and repeat the process in a fluid, ever-changing cycle as teaching situations change,” (Duffy, 2005, p. 301). Effective teachers have a clear goal focus, use feedback to adapt their performance during instruction and reflect after instruction to make adjustments to future lessons. This adaptive decision-making process enacts the same processes that have been identified as characteristic of self-regulated learning (Zimmerman, 2002).

Many models have been proposed to explain the development of teachers (Bain, 2007; Snow et al., 2005). While the focus of each model is slightly different, collectively they suggest that there is a predictable pattern of career development for teachers. Snow et al. (2005) propose a five stage model to explain the changes in teachers' knowledge through education and experience. The stages of this model resemble the stages of regulatory skill development presented by Schunk and Zimmerman (1997). Both models reflect a transition from a basic understanding of the content to a more flexible and adaptive type of knowledge. The five stages proposed by Snow et al. (2005) are defined by the use of declarative knowledge, situated procedural knowledge, stable procedural knowledge, expert adaptive knowledge, finally reflective knowledge.

Tan, Fincher, Manross, Harrington, and Schempp (1994) investigated the differences between novice and experienced teachers in physical education. Interviews were used to gather data about the knowledge these teachers used in planning and conducting classes. Specific differences were found between experienced and novice teachers. Competent teachers anticipated and assessed student differences, were more likely to admit their limitations of knowledge or skill and more often took ownership for student difficulties leading to changes in teaching. The results of this investigation support the model presented by Snow et al. (2005) as well as the application of Schunk and Zimmerman's (1997) model to teacher development. Novice teachers' knowledge was more situated and less flexible than that of experienced teachers. While novice teachers implemented strategies that could have been effective, they were less able to respond when these initial strategies did not reach their individual students.

Bain (2007) proposed a framework for pre-service teachers that followed a progression mirroring common stages of teacher development. Each new practice was embedded into the course with four progressive levels of application. Initially, pre-service teachers completed readings and received lectures focused on knowledge acquisition and awareness. Next, they participated in workshops focused on providing them an active experience with the practice where they experienced the practice as learners. After the workshop, they had the opportunity to apply the practice in a field classroom and receive feedback. Finally, after completing all stages the pre-service teachers were called to apply key feature of the practice within course assignments.

The effectiveness of Bain's (2007) structure was examined by Bain, Lancaster, Zundans and Parkes (2009) during a 13-week inclusive education course with 90 pre-service teachers. The progressive model was used with two strategies applied frequently in inclusive education, cooperative learning and peer assisted learning. Participants responded to four questions repeatedly throughout the experience to gather data regarding their development of knowledge throughout the sequence. The researchers found that students participating in this study demonstrated a mastery level for the professional language regarding these practices. Additionally, participants were able to apply their knowledge of these structures to lesson designs.

Summary

In order to prepare individuals to approach the complexities of teaching, teacher education programs must produce new teachers who are ready to continue learning from everyday practice (Duffy, 2005; Feiman-Nemser, 2001). Teacher educators can provide a

significant knowledge base. However, it is not possible to anticipate all the knowledge necessary for successful teaching (Ball & Cohen, 1999). Pre-service teachers need strategies to learn as teachers as well as a way to organize the knowledge they gain.

Self-regulated learning models provide a potential structure for considering the learning processes of teachers. Zimmerman's (1998) stages of observation, emulation, self-control and self-regulation reflect other models of teacher development as well as the learning of other complex tasks. In the model of self-regulated learning, reflection is used as a means to improve practice. This reflection is based on particular standards of practice and guide self-evaluation. Shulman (1986) has proposed a set of standards that can be used as lenses to evaluate the knowledge about teaching. Pedagogical reasoning is the process teachers use to weigh alternatives in educational settings for the purpose of making decisions. Self-regulated learning strategies provide pre-service teachers with the means to continue learning while the sources of teacher knowledge associated with pedagogical reasoning provide teachers with the organizational structure necessary to reflect on their own decisions.

CHAPTER IV

METHODOLOGY

This study occurred in a clinical, instructional setting specifically designed to support the development of self-regulated decision making for pre-service teachers. Interpretive content analysis was used to examine the nature and intentionality of pre-service teachers' pedagogical reasoning while planning and implementing reading instruction for elementary students. Specifically, this study sought to address the following questions:

1. What types of pedagogical decisions do pre-service teachers recognize in their own practice and the practice of others?
2. How do pre-service teachers apply theoretical, practical and moral knowledge when *observing* the professional practice of others?
3. How do pre-service teachers apply theoretical, practical and moral knowledge when *emulating* the professional practice of others?
4. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-control* in their own professional practice?
5. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-regulation* in their own professional practice?

This chapter will establish the need for the qualitative approach used in this study. Additionally, this chapter describes the instructional setting including the institutional setting, specific instructional sequence and implementation phases. Finally, the methods for data collection and analysis will be provided.

Research Approach

The following section will describe the approach to qualitative research taken within this study including a justification for the use of an interpretive paradigm, disclosure of the researcher's role in the study and techniques planned to increase the trustworthiness of the conclusions drawn from the study.

Interpretive Stance

Interpretive research is primarily a genre of qualitative research, but may include elements of quantitative data as it illuminates aspects of a particular phenomenon (Erickson, 1986). Qualitative methods are used to explore open-ended questions dealing with complex situations. The descriptive nature of the qualitative study allows the researcher to illustrate decisions which occurred over a period of time, within an authentic context (Merriam, 2009). In cases of teaching, the context is as important as the individual actions of teachers because if the context were to change the actions would also likely change (Duffy, 2005). The interpretive stance focuses on the complexity of human decision making within a situation that continues to emerge (Kaplan & Maxwell, 1994).

Qualitative research questions concerned with the actions of individuals acting in social settings are able to be addressed through interpretive research (Erickson, 1986). Interpretive researchers maintain a relativist ontology which assumes that many social realities are formed through individuals' knowledge, experiences and interpretations (Cantrell, 1993). In this particular study, the decisions made by preservice teachers cannot be directly observed. The selected research questions are less concerned with the

actual decisions made than with the processes used to arrive at a particular decision. These decisions are the product of each individual preservice teacher's educational and experiential history. Future actions will be based upon the individual's reflection and perceived success of the current actions. This social reality does not exist in isolation and can only be understood through the preservice teachers' own accounts interpreted through the lens and experience of the researcher. For this reason, an interpretive stance toward data collection and analysis is most appropriate.

Considerations of Trustworthiness

Epistemologically, interpretive researchers believe that the researcher cannot separate oneself from the research process. They understand that the actions related to the study will also impact the social realities of the participants. This has been documented by previous studies of teacher thinking employing data collection techniques of stimulated recall, think aloud and structured journal writing (Clark & Peterson, 1986). Teachers participating in these studies report that their thinking about instruction was impacted by these methods which required them to reflect differently about their teaching (Clark & Peterson, 1986). Rather than try to control for potential effects created by the study, interpretive researchers select methods that are personal and interactive and remain true to their beliefs about the nature and acquisition of knowledge (Cantrell, 1993). Clearly revealing the role, interests and motivation of the researcher can increase the trustworthiness of the conclusions drawn (Merriam, 2009).

In this study, the researcher assumed the role of participant observer (Merriam, 2009). The researcher was both instructor for the course and had worked with each of the

individual pre-service teachers during their junior year methods courses. This established relationship could be viewed as both a benefit and a threat to validity. On one side, the prolonged engagement with these individuals established a level of trust that could facilitate authentic reflection. However, there was a personal investment on the part of the researcher pertaining to their progress and success.

The motivation in studying pre-service teachers' self-regulation was to improve the researcher's practice as a teacher educator. It had been observed in previous years that the students in this particular course have demonstrated qualities of self-regulatory behavior more than was observed in other courses. The researcher's pre-service experience in a reading clinic setting had been very powerful and continued to be very influential in her own development as a teacher educator. This prompted further examination of this experience from the perspective of current pre-service teachers to determine the processes through which developing teachers acquire ownership of teaching decisions.

Instructional Setting

The following section will describe the setting, subject selection and implementation phases of this study.

Setting

This study was implemented within the context of the Mount Mercy University Reading Clinic. Mount Mercy University is a small Midwestern university located in Cedar Rapids, Iowa. The Reading Clinic is an afterschool tutoring program where pre-service teachers prepare and implement lessons for elementary students in need of

additional literacy support. The Reading Clinic, and the co-requisite course *Prescriptive Reading Instruction*, are requirements for completion of a K-8 Reading or K-8 Special Education endorsement within the context of Mount Mercy University's teacher preparation program.

Both the clinical field experience and course instruction are implemented on-site at a local parochial elementary school. Class sessions are held in the elementary school's media room and tutoring takes place in multiple classrooms throughout the school building. Prior to instructing students, pre-service teachers are provided instruction on best practices for teaching less-than-proficient readers. Teaching strategies are modeled for the pre-service teachers by the course instructor and videos are used to demonstrate the application of the strategies with elementary students. Reading assignments focus on theoretical underpinnings for the strategies demonstrated as well as philosophical stances on the instruction of lower performing readers.

Reading Clinic tutoring is directly supervised by the university professor. Lesson plans are submitted by pre-service teachers prior to instructing elementary students using an electronic course management system. Before teaching each lesson, pre-service teachers receive feedback designed to draw their attention to the strengths of their lessons as well as areas for improvement. Tutors are expected to respond to this feedback, by making adjustments to their planned lesson, prior to teaching their student. During the clinical portion of the course, the university professor follows a schedule of observations and directly evaluates each tutor three times during the semester. The first observation is an informal observation with the goal of providing formative feedback to the tutors. The

second and third observations are scored for the purposes of grading as well as to providing formative feedback. In addition, the course instructor teaches a portion of a lesson with each elementary student in order to provide modeling for the tutors. After instruction, tutors are required to complete a reflection using a three-part reflection format. The reflection is designed to help the tutors attend to specific observations of their students and plan instruction for future sessions.

This study was conducted within the context of the Reading Clinic due to several conditions which supported the study of self-regulation in teaching. First, pre-service teachers had the opportunity to plan and teach lessons without the directed guidance of a cooperating teacher. This allowed the researcher to limit the outside influences on the pre-service teachers' decision making around planning and instruction. Pre-service teachers were also allowed the opportunity to become truly self-regulated in their teaching decisions because they were not reliant on the constant guidance of a more informed other. Secondly, this setting provided a structure where class instruction provided to pre-service teachers could be aligned with Schunk and Zimmerman's (1997) model for development of regulatory skill. There were opportunities for direct modeling, feedback and reflection which are necessary conditions for the development of self-regulation.

Subject Selection

During the study, there were 10 students enrolled in the Reading Clinic and corresponding course. All students enrolled in the course and clinical experience were elementary education majors with endorsements in Elementary Reading and/or K-8

Special Education. Seven students provided informed consent to participate in the study. Of these seven students, two were excluded as participants for practical reasons. One preservice teacher worked with an elementary student with significant behavior challenges which required specific alterations to her lesson plans and became the primary focus of her reflections. The second excluded subject experienced technical difficulties on several occasions which made it impossible to collect video self-reflections from her.

The five participants for this study were all senior education students who had already completed their student teaching experience. Utilizing a group of senior level students who had completed student teaching assured the researcher that they had appropriate and sufficient background knowledge to engage in pedagogical reasoning (Shulman, 1986) where they would be required to apply theoretical, practical and moral knowledge about teaching. These students had completed all of the requisite literacy methods courses which should have provided them with sufficient theoretical knowledge about literacy development and instruction. They had also completed their student teaching experience which would provide substantial practical knowledge of teaching including multiple experiences teaching literacy. Finally, students at Mount Mercy University complete their liberal arts capstone course during their student teaching experience. Within the curriculum of the capstone course they are asked to consider the moral implications for teaching which would prepare them to apply moral knowledge about teaching during pedagogical reasoning.

Implementation Phases

Implementation of this study has been divided into three phases (see Table 1). These three phases will be referred to as the introduction, development and conclusion phases of implementation.

Table 1

Implementation Phases

Phase	Content
1. Introduction	Introduce foundational theories <i>Levels of Regulatory Skill</i> (Schunk and Zimmerman, 1997) Sources of Teacher Knowledge (Shulman, 1986)
2. Development	Apply Instructional Sequence Collect Data Samples
3. Conclusion	Evaluate Social Validity of Model Compare practical and theoretical knowledge

During the introduction phase, participants were introduced to the two theories that served as the study's foundation; *Development of Regulatory Skill* (Schunk & Zimmerman, 1997) and *Pedagogical Reasoning* (Shulman, 1986). The instructional sequence, based on Schunk and Zimmerman's *Developmental Levels of Regulatory Skill* (1997), was implemented during the development phase and data was collected through participant reflections at each stage of the instructional sequence. The reflection format

and analysis was informed by the model of Pedagogical Reasoning as defined by Shulman (1986). Finally, the conclusion phase provided an opportunity for participants to reflect on their learning processes to further encourage the practice of self-regulated learning. Additionally, this phase provided the researcher with the opportunity to establish social validity of the model and engage in reflection on her own practice.

Phase 1: Introduction. During the introduction phase, participants were introduced to the conceptual framework for the study. This study is grounded in two specific teaching and learning theories. The first addresses the sources of knowledge that teachers draw from when reasoning pedagogically (Shulman, 1986) and the second defines a developmental progression that describes how people become self-regulated in their actions (Schunk & Zimmerman, 1998). These two theories were combined to contribute to current understanding of how pre-service teachers become self-regulated in their pedagogical decision making.

Development of regulatory skill. Schunk and Zimmerman (1998) defined a developmental, social-cognitive model that can be applied to the development of teaching skill. This model defines four stages of development: *observation*, *emulation*, *self-control* and *self-regulation*. Initial awareness is developed through the *observation* of others. Once students are able to identify significant qualities in the modeling of others, they begin to *emulate* the process independently making gradual progress toward successful implementation. At the next stage, students show *self-control* of the process and are able to recognize the need and implement a process without direct modeling, but cannot generalize it to new situations. At the highest stage, students are able to apply a process

flexibly and make adjustments to fit the situation as needed. It is at this point they have reached *self-regulation*.

It was important to share this structure with participants due to the nature of self-regulated learning. The goal of teaching for self-regulation is to allow the learner to assume responsibility for the acquisition of new knowledge. One aspect of this transfer of responsibility is the development of metacognitive strategies that allow the learner to become aware of their own thinking. Providing participants with the language to discuss this thinking is an important step in scaffolding this process.

Participants were first introduced to the vocabulary terms of *observation*, *emulation*, *self-control*, and *self-regulation* and provided examples that were situated within an elementary literacy context. Since all of the participants had completed their student teaching experience, this was a known context for all of them. Placing this new information into a known context was important to assure a proper level of understanding. To practice the application of this language, participants were asked to reflect on their student teaching experience and identify an experience when they modeled a skill and students were able to transfer the processes of the skill to their own actions.

Next participants were asked to apply the Developmental Levels of Regulatory Skill (Schunk & Zimmerman, 1998) to their own learning during their student teaching experience. They were asked to reflect on an experience where they observed a teaching skill within their cooperating teacher and were able to transfer that skill to their own

practice. They were then asked to label their current level of development based on the descriptions of each developmental level.

Pedagogical reasoning. Shulman (1986, 2006) asserts that teachers draw from three distinct sources of knowledge to make pedagogical decisions (theoretical, practical and moral). The process of combining these sources of knowledge to make instructional decisions is known as pedagogical reasoning. *Theoretical knowledge* is generalized from empirical research and suggests what may be true universally. *Practical knowledge* reflects a teacher's experiences (both as a teacher and learner) and often pertains to aspects of teaching that may never be examined by research. *Moral knowledge* emerges from the teacher's or society's ethical stance and pertains to actions that are 'right' or 'just' when compared to established standards of humanity. Teachers will encounter situations where these sources of knowledge are in conflict; at this point pedagogical reasoning must be employed (Nilsson, 2009; Shulman, 1986).

Pre-service teachers have displayed difficulty in identifying significant aspects of teaching events, either those they have observed or implemented themselves (Baker & Wedman, 2000; Berliner, 1988). It was important to provide pre-service teachers with a structure within which to discuss teaching events that served as a scaffold for reflection during the study. Scaffolding of pre-service teachers' observational skills has been shown to develop schemata for teaching and increase classroom observation ability (Beck et al., 2002). Because observation is the first level of regulatory skill development (Schunk & Zimmerman, 1997) it was critical that participants be able to begin with effective observations so that subsequent development of self-regulation could take place.

After introducing these knowledge sources to participants, they were given the opportunity to apply this structure to a group video discussion. Participants were shown an example literacy lesson and were asked to discuss the theoretical, practical and moral knowledge they believed the teacher in the video was applying or should apply to the given situation. Pre-service teachers were able to draw from their prior knowledge gained through previous methods courses in literacy, practicum experiences in literacy, student teaching experiences, as well as their own standards of ethical practice. If there were knowledge sources (practical, theoretical, moral) where background knowledge was lacking, or where participants had difficulty accessing it, the researcher provided a model for the participants.

Phase 2: Development. During the development phase, an instructional sequence designed to parallel the *Developmental Levels of Regulatory Skill* as described by Schunk and Zimmerman (1998) was applied (see Table 2). There were four separate phases in the instructional sequence: video analysis, lesson planning, lesson implementation, video self-reflection. Each phase was designed to provide pre-service teachers with more autonomy in their professional role and an increased opportunity to demonstrate increased regulatory skill (observation, emulation, self-control, self-regulation).

This sequence was repeated four times throughout the study with each separate cycle focusing on a different instructional technique. Each individual cycle extended over two weeks. The video analysis and lesson planning occurred during the first week of the cycle and the lesson implementation and video self-reflection occurred during the second week of the cycle.

Table 2

Instructional Sequence and Indicators of Regulatory Skill Level

Instructional Activities by Stage	Indicators of Regulatory Skill Level
1. Video Analysis	Observation
<ul style="list-style-type: none"> • Anticipate Practices • Watch teaching video • Identify significant interactions • Reflect on use teacher knowledge 	<ul style="list-style-type: none"> • Recognize key interactions • Describe significant procedures • Develop cognitive model
2. Lesson Planning	Emulation
<ul style="list-style-type: none"> • Write lesson plan • Identify connections to observation • Reflect on teacher knowledge 	<ul style="list-style-type: none"> • Imitate modeled actions • Approximates procedures • Evaluates cognitive model
3. Lesson Implementation	Self-Control
<ul style="list-style-type: none"> • Implement lesson plan • Compare implementation to plan • Reflect on teacher knowledge 	<ul style="list-style-type: none"> • Employ action independently • Internalizes procedures • Evaluates own performance
4. Video Self-Reflection	Self-Regulation
<ul style="list-style-type: none"> • Watch own lesson implementation • Set goals for future instruction • Reflect on teacher knowledge 	<ul style="list-style-type: none"> • Matches action to context • Employs procedures flexibly • Transfers to new contexts

The next cycle began immediately after the completion of the previous cycle. Specific instructional activities and data collection procedures are described by instructional stage in the following sections. After each instructional activity, participants were asked to reflect on the teaching action to identify pedagogical decisions and sources of knowledge using Shulman's (1986) model for teacher knowledge. A specific set of reflective questions was used during each phase to guide this reflection (see Table 3).

Table 3

Reflective Questions by Instructional Stage

Stage	Questions
Observation	<ul style="list-style-type: none"> a. Why do you think this teacher selected this practice? b. What experiences, theories and/or ethical considerations support/challenge this practice?
Emulation	<ul style="list-style-type: none"> a. Why did you plan this specific activity for your student? b. What experiences, theories, and/or ethical considerations support/challenge this practice?
Self-Control	<ul style="list-style-type: none"> a. How did your lesson implementation differ from your lesson plan? b. Why did you make this adaptation? c. What experiences, theories and/or ethical considerations support/challenge this adaptation?
Self-Regulation	<ul style="list-style-type: none"> a. What additional adaptations would you make for future lessons after viewing your video? b. Why would you make these adaptations? c. What experience, theories and/or ethical considerations support/challenge your adaptations?

The next section includes a description of each instructional activity, indicators of the corresponding level of regulatory skill development (Schunk & Zimmerman, 1997) and procedures for reflection using Shulman's (1986) sources of knowledge for teaching.

Observation. During observation, learners carefully watch the practices of more informed others. This can be done in natural settings or through intentional modeling. During these observations, learners who are skilled in observation are able to recognize the key actions of the more informed other. After observation, competent observers are able to describe significant procedures used and develop a cognitive model for storing this new information. Observation is the only level of regulatory skill which is possible

for learners to demonstrate without direct, overt action. However, this does not suggest that the learner is passive during the observation.

For the purposes of this study, video analysis was used to activate and analyze the observational skills of pre-service teachers. Prior to viewing the video, pre-service teachers were introduced to the practice that would be the main focus in the video clip (previewing text, word study, journal writing and modeling strategic reading). Then, pre-service teachers viewed a literacy lesson taught by a competent teacher. These video samples were recorded by the researcher and contained current Reading Recovery teachers in one of the university's professional development schools. While the pre-service teachers viewed the video they kept a running log of the significant interactions viewed in the video. After viewing, pre-service teachers were asked to reflect on a specific practice observed in the video using the questions (a) Why do you think this teacher selected this practice? and (b) What experiences, theories and/or ethical considerations support/challenge this practice? These questions were specifically designed to help pre-service teachers connect to the sources of teacher knowledge as described by Shulman (1986). Participants were then provided instruction on best practices related to the particular teaching technique. The video was discussed as a whole-group using this new theoretical and/or ethical knowledge as a frame for the discussion.

Emulation. During emulation, learners imitate the modeled actions that were previously observed. The actions a learner chooses to emulate are dependent on the cognitive models constructed and key procedures identified during the observation stage.

While emulating, the learner approximates the procedures that were observed. Successive approximations become closer to the actions of the more informed other. After emulation, the learner should be able to evaluate their own performance as well as the appropriateness of their cognitive model.

During this study, pre-service teachers were provided the opportunity to emulate the actions of the teachers in the video by planning a lesson to be taught in the reading clinic. The plan to be submitted was intended to include instruction that would last for approximately one hour. However, the focus section of the lesson for each phase was one 15 minute segment. Within this plan, pre-service teachers were expected to include instructional activities with similar content as the video viewed during the *observation* stage. However, it was not expected that they copy the exact lesson that was observed. This was important as each pre-service teacher was planning for a different student, none of which was represented in the video. Pre-service teachers were asked to reflect on their plan and support their instructional choices, specifically identifying the practices related to the content of the video. For this portion of the lesson, pre-service teachers were asked to address the questions, (a) Why did you plan this specific activity for your student? and (b) What experiences, theories, and/or ethical considerations support/challenge this practice?

Self-Control. When learners demonstrate self-control, they employ the actions that were observed and emulated independently, without a direct model. At the level of self-control, the significant procedures are internalized by the learner and they are able to simultaneously employ and monitor their actions so adjustments can be made while

acting rather than a delayed response. After acting learners are capable of evaluating their own actions based on the cognitive model of successful implementation.

During the implementation stage, pre-service teachers enacted their planned lesson with their tutoring students. After teaching, pre-service teachers completed a reflection addressing the adaptations or changes made to their plan while teaching. Specifically, they addressed the questions (a) How did your lesson implementation differ from your lesson plan? (b) Why did you make this adaptation? and (c) What experiences, theories and/or ethical considerations support/challenge this adaptation?

Self-Regulation. During self-regulation, learners are able to flexibly match their actions to a particular context. This may require them to adapt or change their practice given multiple sources of information. This flexibility characterizes the implementation of self-regulated teaching. A self-regulated teacher is able to make decisions on the spot to follow the responses of students or change practices when a lesson is not proceeding as anticipated. After instruction, self-regulated teachers are able to transfer the key components of successful practices to new contexts. These transferred practices may look very different but the underlying principles remain intact.

During this stage, pre-service teachers recorded and analyzed a video of their own teaching and were asked to compare their implementation of the lesson with their initial plan. Pre-service teachers completed a reflection focused on the discrepancies between their plan and the actual implementation as recorded in the video. Additionally, they were asked to identify other teaching situations where principles related to the target teaching skill could be applied. Specifically, they were asked to address the questions (a) What

additional adaptations would you make for future lessons after viewing your video? (b) Why would you make these adaptations? and (c) What experiences, theories and/or ethical considerations support/challenge your adaptations?

Phase 3: Conclusion. After the fourth completion of instructional sequence, pre-service teachers were asked to reflect on the applicability of Schunk and Zimmerman's *Development of Regulatory Skill* (1997) and Shulman's (1986) sources of teacher knowledge to their learning during the developmental phase. To do this, pre-service teachers were asked to respond in writing to the following questions: (a) Do you believe the model for self-regulated learning applies to your development this semester? If yes, where would you place yourself on this continuum? Why? and (b) What types of teacher knowledge do you believe you most gained this semester? How did this structure support your reflection?

This reflection served both an instructional and research objective. Instructionally, this was an opportunity to foster the metacognitive skills of pre-service teachers and encourage them to assume responsibility for their continued professional development as teachers. This was especially important as the pre-service teachers participating in the study were in their final semester before graduation and licensure. From a research perspective, this was an opportunity to establish social validity by comparing the participants' responses to the analysis completed by the researcher. Alignment in these two perspectives would increase the trustworthiness of the conclusions drawn during data analysis.

Data Collection and Analysis

The study of teacher reasoning provides a specific challenge in that the activity to be observed is not directly observable. Qualitative evidence of thinking can only be collected indirectly through self-reports from the individual or observations of subsequent actions (Sherin et al., 2010). In some areas, participants have been asked to think aloud while completing a task by verbalizing their thinking while it occurs (Ericsson & Simon, 1993). This is not realistic in the study of teaching because the very act of teaching requires verbal interactions to be used for the purposes of teaching.

Previous research in the area of pedagogical reasoning has primarily drawn from three data collection approaches (Sherin et al., 2010). Many studies utilized video or still images of instructional situations to prompt participants' descriptions of instructional decisions (Colestock & Sherin, 2009). However, in these studies the actual teaching was performed by someone other than the participant so the conditions may not accurately portray an active teaching situation. A second approach involved retrospective recall, where teachers were asked to reflect on their instruction immediately following a teaching event (Borko & Livingston, 1989). Finally, as a combination of these two approaches, teachers have been asked to view a video from their own teaching and recall specific decisions made while teaching (Ainley & Luntley, 2007). For each of the last two methods, there is a question of whether a teacher's recollection of their thinking after they have been removed from a teaching situation is accurate (Sherin et al., 2010).

Drawing from previous research on teacher thinking, data for this study was collected through multiple means directly integrated within the instructional sequence

(See Table 4). The three techniques typically used to access teacher thinking (video prompting, stimulated recall, and video-aided recall) were used and data was compared across phases. Additionally, a fourth reflection prompt was used to access pedagogical reasoning during instructional planning. These types of reflection have not been used in previous research on teacher thinking.

Table 4

Data Collection Throughout the Instructional Sequence

Instructional Activity	Data Source	Data Analyzed
1. Video Analysis	Viewing Notes	Teacher knowledge identified
	Post-Video Reflection	Teacher knowledge applied
2. Lesson Planning	Lesson Plans	Similarity to video model
	Reflections	Teacher knowledge applied
3. Lesson Implementation	Structured Observation	Similarity to implementation
	Reflection	Teacher knowledge applied
4. Video Self-Reflection	Video Self-Reflection	Lesson adaptations
		Teacher knowledge applied

During each phase of implementation, pre-service teachers completed an action followed by structured reflection. During the observation phase, participants viewed a video of an expert teacher, noting significant elements of the interaction while viewing.

After viewing the video, participants reflected on the types of teacher knowledge they thought the teacher in the video used while planning and implementing the lesson. During the emulation phase, participants planned a lesson similar to the video viewed in the observation stage and reflected on their own use of teacher knowledge while planning. In the self-control phase they implemented the planned lesson and after implementation they reflected on an adaptation they made while teaching and the reasons for making that adaptation, connecting to types of teacher knowledge. Finally, during the self-regulation phase, participants watched a video of their own teaching and reflected on any additional adaptations they observed while connecting this with the types of teacher knowledge applied.

Data Analysis

This study utilized conventional and directed content analysis techniques for data analysis. Content analysis strategies provide a flexibility and structure for analyzing textual data (Cavanagh, 1997). There are several approaches to qualitative content analysis that share the same fundamental process which allow researchers to organize large quantities of text into content categories (Weber, 1990). All content analysis follows a systematic process that begins with formation of research questions and continues with sample selection, definition of categories, outlining the coding process, implementing coding, determining trustworthiness and finally organizing and analyzing the results (Hsieh & Shannon, 2005). Methods of content analysis primarily differ in the initial determination of codes. The specific method of content analysis should be selected to match specific research questions (Weber, 1990). For the purposes of this study,

conventional content analysis was used to analyze the reasons preservice teachers provide for teaching actions and directed content analysis was used for the application of Shulman's (1986) sources of teacher knowledge.

Types of Pedagogical Decisions. The first research question prompts an inquiry into the types of decisions preservice teachers identify in their own teaching and the teaching of others. This question was addressed first because the identification of a decision was prerequisite to the application of knowledge sources.

Conventional content analysis was used when analyzing the reasons preservice teachers provided for making instructional decisions. Conventional content analysis begins with an open-ended question where little theory exists to guide the coding process. Codes emerge from the data and follow an inductive process (Kondracki & Wellman, 2002). This was the method best suited to the analysis of preservice teacher reasoning because the topic is open ended and the potential responses could not be reliably predicted.

Analysis began with the identification of themes in the pedagogical reasons given for teaching actions. Coding began with the identification of significant phrases within the text that represented a pedagogical reason for an action. These phrases were most clearly identified when they began with the words *because*, *to*, or *so that*. Other phrases were also included if they indicated a specific purpose for a teaching action. Phrases that retold the lesson or explained what had been planned were excluded from analysis as they did not indicate purpose. Each phrase was highlighted and compiled into a separate document that included all of the identified purposes by instructional stage. The phrases

were grouped with others reflecting similar intentions until each phrase was included in a category. This process was then repeated for each stages of the instructional sequence. Finally the categories were compared across stages to check for consistency. A total of eight categories were identified.

Knowledge Sources. The remaining research questions pertained to the application of theoretical, practical and moral knowledge (Shulman, 1986) across the four phases of self-regulatory development (Schunk & Zimmerman, 1998). To understand how pre-service teachers applied teaching knowledge, it was necessary to consider the frequency and explicitness of the application in addition to the instructional context. This context included the type of decision made and the instructional action occurring at the time of the decision.

The application of teaching knowledge was analyzed using a directed content analysis approach. This approach to content analysis is used when a researcher desires to test the applicability of an existing theory within this particular context. The categories of teacher knowledge were defined prior to this study and participants were prompted to apply them to their reflections. Additionally, analysis was informed by the initial analysis of decision types and matched to the stages of self-regulatory development.

Each reflection was individually read and analyzed for the use of Shulman's (1986) sources of teacher knowledge (theoretical, practical, ethical) to justify teaching decisions. Both implicit and explicit uses of the three knowledge sources were coded. Theoretical connections were coded if the participant connected to knowledge about teaching that was gained through instruction or reading and was not connected to prior

experiences. Practical connections were coded if the participant referred to their own lived experiences within classrooms or other related situations. Finally, ethical connections were made when a participant referred to the justness or injustice of a situation. For a connection to be considered explicit, the participant had to name the source of knowledge (theoretical, practical, ethical) or specifically state that they had learned something from an experience, text or research. Implicit connections were counted if a connection was implied but not named (Ex. “I saw my cooperating teacher do this” would be coded as practical.)

Developmental Levels. Two different matrices were used to examine the different patterns among various levels of self-regulatory development. The first matrix had the themes identified within the purposes that preservice teachers provided for their decisions along the top and the levels of self-regulatory development on the side. In each of the boxes of the matrix, the frequency that each theme was identified in a stage was recorded (i.e., how many general instructional goals were identified during the observation stage). Next, each column and row was totaled. Each stage had a different number of total instances, so the frequencies were converted into percentages for ease of comparison. This process was then repeated with a new matrix to compare the types of teacher knowledge applied across developmental stages.

Connections. To identify connections between purposes and knowledge sources, each reflection was reread with this specific purpose in mind. Within the same reflection the researcher compared the text phrases identified to indicate a specific purpose and the phrases connected with the types of teacher knowledge. To be considered to be

connected, the stated purpose and reflection of teacher knowledge had to refer to the same action in order to be considered a match. If they discussed different actions they were considered to be unconnected and were tabulated outside of the matrix. Each set of connected phrases was tallied in the appropriate square of a matrix with the instructional purposes along the top and sources of teacher knowledge along the side. Total frequencies were calculated for each interaction as well as the totals for each category. Finally, the phrases that were not connected were totaled for each category.

Summary

This chapter has described the research methodology used in this study including the selection of interpretive content analysis as a research approach, the instructional setting, selection of participants and methods for data collection and analysis.

CHAPTER V

FINDINGS

This study occurred in a clinical, instructional setting specifically designed to support the development of self-regulated decision making for pre-service teachers. Interpretive content analysis was used to examine the nature and intentionality of pre-service teachers' pedagogical reasoning while planning and implementing reading instruction for elementary students. Specifically, this study sought to address the following questions:

1. What types of pedagogical decisions do pre-service teachers recognize in their own practice and the practice of others?
2. How do pre-service teachers apply theoretical, practical and moral knowledge when *observing* the professional practice of others?
3. How do pre-service teachers apply theoretical, practical and moral knowledge when *emulating* the professional practice of others?
4. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-control* in their own professional practice?
5. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-regulation* in their own professional practice?

This chapter presents the findings from the interpretive content analysis addressing the research questions listed above. First, results of a conventional content analysis will be presented to describe the types of decisions pre-service teachers recognize in their teaching and the teaching of others. The next section will summarize

the results of a directed content analysis of the types of teacher knowledge (theoretical, practical, ethical) preservice teachers used to justify teaching decisions. Finally, patterns from these two analyses will be merged to describe the decisions recognized through preservice teachers' levels of self-regulatory development (observation, emulation, self-control, and self-regulation).

Pedagogical Decisions

Conventional content analysis was used to address the first research question pertaining to the reasons preservice teachers provided for making instructional decisions. First, significant phrases that clearly identified instructional purposes for teaching actions were identified. Next these phrases were grouped with others representing similar intentions. Eight themes were identified; each of these themes will be described in more detail here.

General Instructional Goals

Purpose statements connected to general instructional goals had two defining characteristics. First, they were focused specifically on an outcome of instruction. Second, this focus was not specifically connected to the stated goals for the student and may represent an action taken for any student in this situation. For example, one purpose given for instruction was "to prepare the student for unfamiliar words or potentially confusing parts of the story." In this statement, the goal was clearly connected to word identification which makes it an instructional goal. However, there was no mention in the reflection referring to their specific student's difficulty in the area of word identification

or specific words that the student would likely have difficulty with given their past history of errors.

Another example of a general instructional purpose was, “This gets his brain warmed up and thinking before we hop into the book and read.” This example does not have a specific reference to an instructional domain (i.e., word identification such as in the last example). However, there is a connection to accessing background knowledge and preparing for instruction. There is also no specific connection to the instructional needs of the student or which particular areas of background knowledge need to be accessed prior to reading.

Specific Instructional Goals

Purposes in the category of specific instructional goals also have a clear instructional focus. However, they are directly connected to the needs identified for the particular student receiving instruction. Rather than being a teaching action that could be defensibly applied to any student receiving literacy instruction, they were specifically chosen to meet the individual needs of one student. For example, “generally he will say a lot about a topic but then once he goes to write it he only remembers the first two words he planned to write.” As in this example, purposes placed into this category often referred to knowledge gained through either working with or assessing the student receiving instruction. This tutor observed a need within her student and planned a strategy to specifically respond to this need.

Some of the purpose statements in this category also referred to the initial assessments given to the student or the initial goal selection. One participant wrote, “it

was a blend that Anna did not know when she was initially assessed,” and another stated, “sight word identification is one of his goal areas.” (All names are pseudonyms.) While these both referred to prior knowledge, rather than knowledge gained through the act of teaching, they did connect the purpose of instruction to a characteristic of their specific student.

Using Informal Assessment

While there is an element of assessment interwoven into some of the specific instructional responses described above, those placed into the category of using informal assessment made an explicit reference to the observations of the student made while teaching. For example, “I reviewed the words she didn’t know on the sight word assessment.” The explicitness of the reference is important because it signaled that the preservice teacher identified the role of assessment to guide instruction. Those implicit connections to assessment in the specific instructional response category could easily be made by the researcher or others accustomed to the use of informal assessment, but the significance for this study was in the perception of the preservice teacher. If a preservice teacher could state that, “he didn’t have many errors and was able to retell the story” it was clear that they had attended to informal assessments.

Another distinction in the purpose statements placed in the category of using informal assessment versus being placed into the specific instructional response category was an issue of sequencing. Most of the statements placed into the specific instructional response category were written with a proactive stance and seemed to reflect thoughts that occurred before instruction. For example, “I wanted to make sure he could locate it

on his own so I had him find it.” In contrast, those placed into the category of using informal assessment were written with a more reactive stance or something that the tutor responded to during the lesson itself. An example illustrating this was, “I didn’t focus on the idea cards as much as I thought I would. It was not needed.”

Gathering Informal Assessment

The purposes related to gathering informal assessment also need to be understood in contrast to the previous category of using informal assessment. Those placed into the using informal assessment category focused on using information discovered through assessment to inform instructional decisions. Those placed into the category of gathering informal assessment reflected the purposeful gathering of new information during the act of teaching. For example, one participant wanted “to see how he sounds out a few of these more challenging words” in their lesson plan reflection. This purpose is not instructional because they are not providing any new information or practice to the student. There is a clear assessment purpose here where the tutor wanted to observe the results of previous instruction.

Many times the plan for gathering informal assessment was integrated into the actual teaching event. One tutor developed a writing prompt that included causation because would require the use of a word she had worked with during the previous lesson. She wrote, “I am hoping to see him write the word because again” revealing her intentional purpose to the prompt. Another tutor planned to gather informal assessment information that would specifically guide her future lesson planning. She asked him to identify known vocabulary words in one of the books that he was reading. She wrote, “I

can later use this information to find more books that George has background information about.”

Long-term Literacy Goals

Purposes focusing on long-term literacy goals were aimed toward building certain positive dispositions toward literacy that extended beyond the specific lesson or intervention. These were not stated instructional goals for the student and often focused on an overall stance rather than a specific instructional action. For example, one preservice teacher reflected after observing their first video that the Reading Recovery teacher’s instruction “focused on making meaning versus simply decoding.” While there was no specific comprehension instruction occurring in the video, this tutor recognized an overarching view of literacy within the instruction. This view promoted a focus on meaning making rather than simply code breaking.

Many statements referred to a focus on making meaning, but others discussed a desire for the student to find purpose and connection between literacy and the tasks they were presenting. One hoped that his lesson would “help him realize the importance not only of knowing the word but being able to spell it too,” while another wanted her student to “see that what we are practicing in word work is important.” While these last statements also incorporate an element of motivation, they were set apart from the other comments connected to motivation because they were less focused on providing motivational activities and more focused on building a desire to learn literacy within the students themselves. This important distinction between extrinsic motivation and an intrinsic desire to learn set them apart from motivational purposes.

Motivation and Affect

Purpose statements placed into the category of motivation and affect were focused on gaining the attention of the student and maintaining it in a positive way. Some of the statements explicitly referred to motivation, “this gave him more interest and motivation to read the story,” and “She needed something more motivating and not so routine.” However, in most of these cases the motivation was focused on the task itself rather than building a true desire to learn. One stated explicitly connected to the task when she wrote, “by engaging Anna with manipulatives she may be more motivated to complete the task at hand.” In this part of the reflection there was no mention of the learning that she wanted to take place.

Other comments related to motivation and affect focused on maintaining attention and helping active students focus on the task. This is related more to the element of affect and making practice more palatable. One preservice teacher wrote, “This takes the routine (sometimes boring) piece away.” This negative view of routines also was mentioned in other reflections. One reflection that stood out from this commented about holding back some of the information during her text introduction. She said, “I didn’t want to ruin the story for him by telling him everything that happened.” This is more closely related to motivation and maintaining the student’s desire to read the given text.

Classroom Management

The themes of classroom management and motivation and affect are closely related in a similar way to that of specific instructional responses and using informal assessment. Most of the comments pertaining to motivation and affect were proactive in

nature and seemed to indicate a desire to avoid boring the student with instruction. The comments related to classroom management are more reactive in nature and focus on responses to challenges encountered during the lesson. For example, the same preservice teacher who wrote that she did not want to ruin the story for her student (see above) wrote that she “didn’t see a point in arguing with him when he obviously wanted to read the book.”

There were other statements placed into the classroom management category that had less to do with managing the student than managing the situation. There were classroom conditions that made it difficult to hear, students who forgot to bring their glasses and parents who picked their children up early from tutoring. While these situations are somewhat outside of the instructional context, they did require an instructional response. One tutor had to balance purpose with time. She added an additional practice because in her words, “I didn’t want to move onto the next portion of our lesson for there was not enough time.”

Sharing Ownership

The final category identified within the purpose statements pertained to sharing ownership of the literacy task between teacher and student. Each of these statements specifically referred to elements of the literacy task that the teacher assumed rather than giving the ownership to the student. In some cases this was perceived as a positive means of scaffolding, “Instead of wasting time and causing frustration the letters were just given to him.” In this case the preservice teacher recognized that the portion of the task assumed by the teacher was not significant to the broader learning objective and by

taking on this part it gave the student an opportunity to apply what he did know. In other cases, the preservice teacher recognized that she assumed too much responsibility within the task. One wrote, “I was very much in control of turning the pages in this book, which should have been put on Trenton as his responsibility.”

In other statements, the preservice teacher focused on the future and how building self-regulation would help the student. After an observation lesson one preservice teacher wrote, “He now has a strategy to help him spell on his own.” During a later video reflection this same preservice teacher reflected on her own teaching. She wrote, “it gives more responsibility to Anna rather than her depending on me for the correct spelling of the word.” Several other preservice teachers wrote about the need to foster independence within their students by providing strategies.

Pedagogical Decisions Across Self-Regulatory Stages

To determine whether there is a relationship between the purposes preservice teachers attribute to teaching decisions and the level of self-regulation associated with those teaching tasks, a content analysis matrix was used (See Table 5). The stages of self-regulatory development were placed at the top of the matrix and identified themes within the purpose statements were placed along the side. The number of purpose statements associated with each theme was placed in the box intersecting with the corresponding level of self-regulation.

A total of 109 purpose statements were identified across all of the levels of development. Of these 109 statements, 35 (36.7%) were made during the observation stages of the instructional sequence and 38 (34.9%) were made during the emulation

stages. There were 14 (12.8%) purpose statements made during the self-control stages and 17 (15.6%) during the self-regulation stages. The combined total for these final two stages was 31 (28.4%) which is less than in either of the other single stages.

Table 5

Pedagogical Decisions by Stage

	Observation	Emulation	Self-Control	Self-Regulation	Total
General Instructional Goals	10 (25%)	13 (34.2%)	3 (21.4%)	0 (0%)	26
Specific Instructional Goals	9 (22.5%)	12 (31.5%)	3 (21.4%)	3 (17.6%)	27
Using Informal Assessment	0 (0%)	0 (0%)	3 (21.4%)	4 (23.5%)	7
Gathering Informal Assessment	0 (0%)	7 (18.4%)	2 (14.2%)	0 (0%)	9
Long-term Literacy Goals	5 (12.5%)	3 (7.8%)	0 (0%)	0 (0%)	8
Motivation/Affect Management	11 (27.5%)	3 (7.8%)	0 (0%)	0 (0%)	14
Sharing Ownership	0 (0%)	0 (0%)	3 (21.4%)	5 (29.4%)	8
	5 (12.5%)	0 (0%)	0 (0%)	5 (29.4%)	10
Total	40	38	14	17	109

During the observation stage, there were many identified purposes and the total was second only to the emulation stage. The majority of the reflections identified more than one possible purpose for each of the observed actions. Three themes were most prevalent; Motivation/Affect (11, 27.5%), General Instructional Goals (10, 25.0%), and

Specific Instructional Goals (9, 22.5%). Two other themes appeared during this stage at a similar rate; Long-term Literacy Goals (5, 12.5%) and Sharing Ownership (5, 12.5%). It appears that during observation, the preservice teachers were instructionally focused with slightly more emphasis placed on general goals for instruction rather than specific. Additionally, motivation was important to them with an emphasis on making instruction fun and engaging for the student. There was no mention of using or gathering informal assessment or classroom management during this stage.

During the emulation stage, the most connections to instructional purposes were provided. The majority of these purposes were classified as either general instructional goals (13, 34.2%) or specific instructional goals (12, 31.5%). While the frequency of statements in these categories is similar to those in the observation stage, the identification of purposes related to motivation or affect decreased dramatically (3, 7.8%). Purposes of long-term literacy goals also decreased (3, 7.8%). There were seven (18.4%) statements connected to gathering informal assessment identified in this stage. This was the first time that this category appeared in the sequence. No statements connected to using informal assessment, classroom management or sharing ownership were identified during this stage.

The number of statements connected to an instructional purpose was much lower during the self-control stage. However, the distribution between categories represented was much more even. During this stage, general instructional goals, specific instructional goals, using informal assessment and classroom management each were connected to three (21.4%) statements. There were also two comments connected to gathering

informal assessment (14.2%). No statements were connected to long-term literacy goals, motivation/affect, or sharing ownership during this phase.

Finally, during the self-regulation stage there were slightly more connections made than in the self-control stage (17, 16.3%). There was no clear dominant purpose identified for instructional decisions. Classroom management and sharing ownership each were connected to five (29.4%) statements. Four (23.5%) additional statements were connected to using informal assessment and three (17.6%) were connected to specific instructional goals. There were no statements connected to general instructional goals, gathering informal assessment, long-term literacy goals or motivation/affect.

Sources of Teacher Knowledge

The second through fifth research questions were addressed together as this provided a more complex and realistic understanding of pre-service teachers' decision making processes. First, the frequency of application was determined for each of Shulman's (1986) sources of teacher knowledge. Next, this application was matched to both the types of teacher decisions made (as described in the previous section) as well as the stages of self-regulatory development (Schunk & Zimmerman, 1998).

There were a total of 114 statements either explicitly or implicitly connecting to teacher knowledge across all instructional phases. Connections were considered explicit if the participant named the source of knowledge (theoretical, practical, ethical) or specifically stated that they had learned something from an experience, text or research. Implicit connections were counted if a connection was implied but not directly named. If a connection was counted as explicit, any implicit reference included with the same

reference was not counted. Across all knowledge sources, 44 explicit connections were made and an additional 70 connections were identified as implicit.

Of the 114 statements, 50 (43.8%) connected to theoretical knowledge. Fifteen of the 50 statements connecting to theoretical knowledge were made explicitly and 35 additional implicit connections were made. Thirty-nine (34.2%) connections were made to practical knowledge. Of the 39 practical connections, 15 were made explicitly and an additional 24 implicit connections were made. Twenty-five (21.9%) connections were made to moral knowledge. Of the 25 moral connections, 14 were made explicitly with an additional 11 implicit connections made.

This data indicates that pre-service teachers most frequently connected to theoretical knowledge (43.8%) and least frequently connected to moral knowledge (21.9%). However, there were a similar number of explicit connections among all three types of knowledge (15 theoretical, 15 practical and 14 moral). Of the moral connections, a higher proportion were explicit (56% of 25) as compared to theoretical (30% of 50) and practical knowledge (38.4% of 39).

Knowledge Sources across Self-Regulatory Stages

To determine whether there is a relationship between the level of self-regulatory development and the use of teacher knowledge sources, a content analysis matrix was used (See Table 6). The stages of regulatory development were placed at the top of the matrix and the sources of teacher knowledge were placed along the side with separate rows for implicit or explicit application of this knowledge. The number of connections to

each source of teacher knowledge was recorded in the appropriate box indicating the stage at which the connection occurred.

Of the 114 total statements connecting to teacher knowledge, 25 (21.9%) were made during the observation stages of the instructional sequence and 37 (32.4%) were made during the emulation stages. There were 28 (24.5%) purpose statements made during the self-control stages and 24 (21.0%) during the self-regulation stages. The most connections were made during the emulation stage where preservice teachers were planning their own lessons. The other three stages had similar numbers of connections.

Table 6

Knowledge Sources by Stage

	Observation	Emulation	Self-Control	Self-Regulation	Total
Theoretical-Implicit	15	10	5	5	
Theoretical-Explicit	2	4	5	4	
Theoretical-Total	17(68%)	14 (37.8%)	10 (37.5%)	9 (37.5%)	50
Practical-Implicit	3	9	6	6	
Practical-Explicit	2	7	5	1	
Practical-Total	5 (20%)	16 (43.2%)	11 (39.2%)	7 (29.1%)	39
Moral-Implicit	1	2	4	4	
Moral-Explicit	2	5	3	4	
Moral-Total	3 (12%)	7 (18.9%)	7 (25%)	8 (33.3%)	25
Stage Totals	25	37	28	24	114

Theoretical knowledge was referenced most commonly with 50 (43.8%) connections throughout all stages. The next most common knowledge source referenced was practical knowledge with 39 (34.2%) connections. Ethical knowledge was the least commonly referenced knowledge source across all stages (25, 21.9%). These connections were categorized as either implicit or explicit. To be considered explicit, the reflection had to specifically name the knowledge source or synonym (ex. Research was considered theoretical, experience was considered practical, etc.). To be considered an implicit connection, the description provided had to be specific enough that a connection was clear (e.x., “I have seen another teacher do something similar” was counted for practical knowledge).

During the observation stage, the majority of the connections (17, 68.0%) were made to theoretical knowledge. Of these 17 connections, 15 were implicitly connected where preservice teachers referred to knowledge from texts and classes but did not explicitly name them as theoretical connections or name a specific theory. There were only two of these specific, explicit connections to theoretical knowledge. There were five (20.0%) connections made to practical knowledge, three being implicit and two where the reflection specifically claimed experience or practical knowledge as the source of understanding. There were also three (12.0%) connections to ethical knowledge, two were explicit and one was implicit.

Practical knowledge was more prevalent during the emulation stage. There were 16 (43.2%) connections made to practical knowledge, nine were implicit and seven were explicit. Theoretical knowledge was more similar to practical knowledge in this stage

with 14 (37.8%) connections, 10 were implicit and four explicit. Ethical knowledge was still the least common. However, there were more connections (7, 18.9%) than in the previous stage.

During the self-control stage, the distribution of references was even more similar. The most connections were made to practical knowledge (11, 39.5%), six were implicit and five explicit. This was only slightly more than the references to theoretical knowledge (10, 37.5%), which were evenly distributed between explicit and implicit. Ethical knowledge was still the least commonly referenced (7, 25.0%) knowledge source, but was used with an increased percentage during this stage. Four of the ethical references were implicit and three were explicit.

Finally, during the self-regulation stage, the distribution between all three knowledge sources was more even. Theoretical knowledge was referenced nine (43.8%) times with five implicit and four explicit references. Practical knowledge was referenced seven (29.1%) times with six implicit and one explicit reference. Finally, ethical knowledge received the largest proportion of references of any stage with eight (33.3%) connections evenly divided between implicit and explicit references.

Comparing each type of teacher knowledge by stage reveals that theoretical knowledge was initially used more frequently, but decreased significantly from observation (68%) to emulation (37.8%) and maintained a similar prevalence in the self-control (37.5%) and self-regulation (37.5%) stages. Practical knowledge initially increased from the observation (20.0%) to emulation (43.2%) stages. It seems as though the reduction in theoretical knowledge use was transferred to practical knowledge when

preservice teachers began writing their own lesson plans. Then connections to practical knowledge slightly decreased during the self-control (39.2%) and self-regulation (29.1%) stages. These decreases in practical knowledge application seem to have made way for the application of ethical knowledge that started quite low in the observation stage (12.0%) and gradually increased throughout the rest of the stages (emulation 18.9%, self-control 25.0%, self-regulation 33.3%).

Using Knowledge Sources to Make Decisions

To determine whether there is a relationship between the knowledge sources preservice teachers use and the types of decisions they identify, a content analysis matrix was used (See Table 7). The identified themes within the purpose statements were placed at the top of the matrix and the sources of teacher knowledge were placed along the side. The number of purpose statements associated with each theme was placed in the box intersecting with the corresponding level of self-regulation.

There were 48 statements connecting teaching decisions to instructional goals (general or specific) representing the largest group. Of these 48 connections, 16 (33%) were not connected to a source of teacher knowledge. A higher proportion of instructional decisions were attributed to a source of teacher knowledge than all but one of the other categories. Three (6%) were connected to moral knowledge, with one explicit connection and two implicit connections. Thirteen (27%) were connected to practical knowledge, with nine explicit and four implicit connections. Sixteen (33%) were connected to theoretical knowledge, with seven explicit and nine implicit connections.

While connections were made between instructional goals and all knowledge sources, it is clear that moral knowledge was identified less than the other areas.

Table 7

Knowledge Sources by Type of Decision

	Practical- Implicit	Practical- Explicit	Theoretical- Implicit	Theoretical- Explicit	Moral- Implicit	Moral- Explicit	Not Connected
General							
Instruction	2	4	4	3	1	0	11
Goals							
Specific							
Instructional	2	5	5	4	0	2	5
Goals							
Using							
Informal	1	0	1	0	3	1	2
Assessment							
Gathering							
Informal	2	2	1	0	0	1	3
Assessment							
Long-term							
Literacy	1	0	2	0	0	0	5
Goals							
Motivation/ Affect	2	2	1	0	0	0	9
Management							
	2	0	0	0	2	1	3
Sharing							
Ownership	0	0	2	0	1	2	5

Seventeen teaching decisions were connected to the gathering or use of informal assessment data. Of these 17 connections, five (29%) were not connected to a source of teacher knowledge. This is the highest rate of connection for any category, though there

were more instructional goals identified. Five (29%) were connected to moral knowledge, with two explicit and three implicit connections. Five (29%) additional connections were made to practical knowledge, with two explicit and three implicit connections. Two (11%) were connected to theoretical knowledge implicitly with no explicit connections. This lack of theoretical connection is incongruent with the high percentage of connections made as well as with the high rate of theoretical connection overall.

Eight teaching decisions were connected to long-term literacy goals, five (62%) of which were not connected to a source of teacher knowledge. Of the three long-term literacy goals that were connected, two (25%) were implicitly connected to theoretical knowledge and one (12%) was implicitly connected to practical knowledge. Fourteen teaching decisions were connected to motivation and affect. Of these 14 connections, nine (64%) were not connected to a source of teacher knowledge. Four (28%) were connected to practical knowledge, equally divided among implicit and explicit. One connection was implicitly made to theoretical knowledge. These two areas (long-term literacy goals and motivation/affect) had the lowest rate of connection to sources of teacher knowledge. No connections were made to moral knowledge in either of these categories. Given the affective nature of these categories, this particular gap is significant.

Eight teaching decisions were connected to classroom management considerations. Of these eight connections, three (37%) were not connected to a source of teacher knowledge. Three (37%) were connected to moral knowledge, with two implicit and one explicit connection. Two (25%) were connected to practical knowledge

implicitly. No connections were made to theoretical knowledge, which is notable given that decisions based on management had the second highest rate of connection among all categories.

Ten teaching decisions were connected to sharing ownership between teacher and student. Of these 10 connections, five (50%) were not connected to a source of teacher knowledge. Two (20%) were connected to theoretical knowledge implicitly. Three (30%) were connected to moral knowledge, two explicitly and one implicitly. No connections were made between sharing ownership and practical knowledge of teaching.

Summary

Pre-service teachers were able to identify teaching decisions in both their teaching and that of others. They made the most connections while planning instruction and justifying their decisions. However, they were more likely to attribute multiple reasons for actions observed in others where they were speculating the teacher decision-making that was occurring and may have considered multiple reasons for actions.

When observing other teachers and planning lessons, pre-service teachers gave most attention to either general or specific instructional goals. Affective factors of long-term literacy goals and motivation were also considered in these early phases and not explicitly stated in the later phases. During the implementation and reflection stages, pre-service teachers' attention shifted to the gathering and use of informal assessment data and considerations of classroom management. Some pre-service teachers planned for the gathering of assessment data during the planning phase, but none planned with consideration to classroom management. In fact, most reflection pertaining to

management occurred well after the initial implementation of the lesson. They did not seem to notice some of the management concerns until viewing a video of their own teaching.

Pre-service teachers were able to connect their observations and actions to the three sources of teacher knowledge. Initially, the distribution across stages of self-regulatory development seems somewhat even among the stages with slightly more connections made during planning. However, the initial connections during observation favor theoretical knowledge and gradually show a more even distribution between all three. Practical knowledge seems to have a greater impact during planning and implementation, dropping off during reflection. Moral knowledge maintains its prevalence from planning through reflection.

Comparing the use of teacher knowledge to the types of decisions identified by preservice teachers reveals potential gaps. Instructional goals seem to largely favor practical and theoretical knowledge with little consideration for the moral implications of that instruction. When considering assessment and management, pre-service teachers connected to practical experiences and potential moral implications but did not refer to theories related to these areas. It appears that while pre-service teachers recognize that they need to consider the long-term effects of their decisions on students' affect, they are not fluent with the theories or ethical considerations for doing so. Finally, they may lack effective modeling in these affective areas as well as establishing shared ownership with students. Alternatively, they may need more scaffolding to recognize these goals in practice.

CHAPTER VI

DISCUSSION

This study occurred in a clinical, instructional setting specifically designed to support the development of self-regulated decision making for pre-service teachers. Interpretive content analysis was used to examine the nature and intentionality of pre-service teachers' pedagogical reasoning while planning and implementing reading instruction for elementary students. Specifically, this study sought to address the following questions:

1. What types of pedagogical decisions do pre-service teachers recognize in their own practice and the practice of others?
2. How do pre-service teachers apply theoretical, practical and moral knowledge when *observing* the professional practice of others?
3. How do pre-service teachers apply theoretical, practical and moral knowledge when *emulating* the professional practice of others?
4. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-control* in their own professional practice?
5. How do pre-service teachers apply theoretical, practical and moral knowledge when demonstrating *self-regulation* in their own professional practice?

The act of teaching is inherently complex, consisting of countless interactions between numerous individuals (Lampert, 2001; Shulman, 2005). The only certainty in teaching is its uncertain nature (Spillane et al., 2002). When you consider the teaching of teachers it is only logical that the variables become exponential, and possible infinite.

And yet each day teacher educators approach the task of educating tomorrow's educators, sometimes with little guidance and a great deal of scrutiny (Korthagen, 2010). Some even question if teacher education has any impact on practice (Stigler & Thompson, 2009).

Teacher-educators need a clear, yet inclusive model to guide their work as well.

Many prominent educational researchers have examined the thinking patterns of proficient individuals in order to guide the instruction of novices. The patterns of the novice are then compared to expert patterns, and instruction occurs within the gap that is identified. While found to be quite effective, this model requires a means through which to access the novice's pattern of thinking and the ability to respond to this pattern in a particular way. This response should both give credit to their current understanding and encourage them to form more sophisticated understandings. This chapter will discuss the findings of this study in light of these goals; identifying patterns of pre-service teacher thinking and possible teacher-educator responses.

Juggling Priorities: Pre-service Teacher Decisions

Pre-service teachers are able to recognize various types of instructional decisions they make and others make while teaching. While the quality of these decisions was not specifically considered, it is important to note that pre-service teachers recognize the need for such decisions. It is also important to note that while decisions were noted throughout all developmental stages of self-regulated teaching, there were certain teaching actions that prompted more decision-making and different types of decision making.

Decision Frequency by Stage

Pre-service teachers were more likely to recognize decisions made while they observed a lesson to be taught or planned a lesson they were going to teach. There are many possible reasons that this could be true. First, it is possible that pre-service teachers were less occupied by other teaching tasks during these phases which allowed them to focus more specifically on the decisions they were making. While actively teaching, their attention is more likely to be devoted to the specific responses given to the student rather than a metacognitive awareness of these decisions. Secondly, during the observation phase they were speculating about the decision-making processes of the teacher. Due to this condition, they may be considering multiple possibilities for the thinking of the teacher. When they are making the decisions themselves, they are more aware of the actual reasons for the decision. This may also be the case while they are engaged with lesson planning. At this point there are many possible actions and they may be considering multiple pathways.

Types of Decisions by Stage

There were also patterns in the types of decisions made across developmental stages. It is important to note that these stages were repeated throughout the study in a cyclical manner. Because of this, the pattern cannot be attributed to the development of the individual pre-service teacher or content that had not yet been covered in the course because they would have another opportunity to demonstrate the specific type of decision in a later cycle. It is more likely that this relationship was connected to the type of teaching task that the pre-service teacher was engaged with at this point in the cycle.

During the beginning stages of the lesson cycle, where pre-service teachers were observing and planning lessons, they had a clear focus on instructional goals. More connections were made to instructional goals than any other type of decision and more connections were made during these stages than the final two stages. This shows that pre-service teachers understand the importance of instructional goals and objectives. However, this clear emphasis on goals does not continue into the final two stages. Similarly, the focus on motivation and long-term literacy goals falls off dramatically as pre-service teachers enter the implementation and reflection stages. They did plan with these goals in mind but they did not maintain this focus. This indicates that pre-service teachers may not be maintaining a goal focus while they are implementing and reflecting on a lesson. It is possible that their attention is more focused on other aspects of the act of teaching, but it could also indicate that they are not making real-time decisions that contribute to these overall goals.

An opposite pattern is found for the areas of classroom management and assessment. During the initial stages, pre-service teachers did not recognize or plan for the use of informal assessment or classroom management strategies. During implementation and reflection, pre-service teachers noted how they gathered informal assessment data about their student and how they either used it, or planned to use it, to respond instructionally. Similarly, there was no evidence that pre-service teachers planned with classroom management in mind. The management decisions were made in response to a problem or situation that presented itself during implementation. Pre-service teachers demonstrated a reactive stance to both management and assessment. This

suggests that more scaffolding, direction or prompting is needed to help pre-service teachers consider these aspects as they plan. It is also evident that they do not recognize the actions of practicing teachers with respect to assessment and classroom management. One feature of these teaching processes is that they are subtle and, when done well, do not interrupt the flow of instruction. Because of this, it is possible that pre-service teachers have never noticed these processes in natural practice.

Managing Resources: Accessing Knowledge Sources to Make Decisions

Pre-service teachers were able to apply the all three sources of teacher knowledge (theoretical, practical, ethical) as identified by Shulman (1986) during each phase of self-regulatory teaching (observation, emulation, self-control, self-regulation). However, the degree to which they applied this knowledge varied both by phase, level of explicitness and decision type.

Theoretical Knowledge

Overall, pre-service teachers favored theoretical knowledge about teaching. This was knowledge gained either through text reading or course instruction. This tendency toward theoretical knowledge was most heavily weighted during observation and gradually diminished throughout the teaching phases. This emphasis on theoretical knowledge during the early phases of teaching may have been due to their lack of practical knowledge about the teaching situation they were observing, or it could be because they have been asked to connect to the text in most of their other coursework.

While, they did connect theoretically to teacher knowledge the connections were not explicit. This indicates that while they may have some knowledge of the theory, they

are not able to refer to specific names or researchers. Because of this, it is possible that what appears to be theoretical knowledge is actually practical knowledge gained through their own experiences as a student.

Theoretical knowledge was also most often used for decisions pertaining to instructional goals. Pre-service teachers were able to name specific teaching techniques they had gained in their methods courses and defend their practices by referring to these techniques. These connections to practices were divided fairly evenly between explicit and implicit connections. This was not the case for the other types of teaching decisions. There were no explicit connections for any of the other types of decisions made. This indicates that the teacher education program may not emphasize the theories of assessment, motivation or management enough for the pre-service teachers to internalize these ideas. There were some implicit connections, but at a much lower rate than in the instructional areas.

Practical Knowledge

Practical knowledge was applied most frequently while pre-service teachers were planning lessons. They were able to make connections, both explicitly and implicitly, to lessons they had observed being taught. However, pre-service teachers most commonly cited internal experiences (within the bounds of this clinical practicum) rather than external experiences (previous or concurrent experiences outside of this clinical practicum). This suggests that teacher educators must carefully structure experiences for their candidates that allow for cyclical application of Practical Knowledge. This cannot happen when teacher candidates teach isolated lessons where there is little opportunity

for direct reflection and application. At a minimum, pre-service teachers should have the opportunity to teach a small series of lessons so that lessons learned during the early lessons can be applied to other lessons in the sequence. Also, since the effective transfer of these experiences is difficult, this should occur in multiple content areas and contexts rather than being isolated within a particular course or field experience.

Practical knowledge was used as a similar rate across a variety of teaching decisions; including instructional goals, gathering informal assessment, motivation and management. However, there were not practical references related to sharing ownership of the literacy process with students and only one reference each for using informal assessment data and supporting long-term literacy goals. These areas may be more difficult for pre-service teachers to observe and may need more explicit modeling by teacher-educators and cooperating teachers. In contrast, the practices of gathering informal assessment data and student motivation were most heavily related to practical knowledge in the absence of theoretical or moral knowledge.

Moral Knowledge

Moral knowledge was applied the least frequently of all knowledge sources. This may be because this source of knowledge was least familiar to the pre-service teachers. However, there were some connections made to moral knowledge in each of the self-regulatory phases and the connections were more evenly distributed between explicit and implicit than in the other areas. Moral knowledge was used most frequently during reflection. It is possible that watching their own teaching while reflecting on a lesson allowed them to view the interaction in a different way. It is also possible that as they

were prompted to reflect on the theoretical, practical and moral knowledge they used while teaching that they were reflecting on the lesson differently than they would have without this prompt.

Moral knowledge was applied most frequently to discuss decisions related to instructional goals, assessment, shared ownership and management. Pre-service teachers discussed how the practices of assessment and management in particular could have a negative impact on students if they were not careful about their implementation. They also discussed how it was important to encourage independence from their students so that they would be able to continue learning on their own. It was interesting that the connection to moral knowledge was not made in relation to long-term literacy goals and motivation. These two areas are inherently affective and it would seem logical to connect them with moral knowledge. It is possible that pre-service teachers viewed sharing ownership as supporting a longer-term goal for literacy development or possibly supporting motivation. However, this was not made explicit in their reflections.

Seeking Learning Opportunities: Directions for Future Research

Teacher educators have long known that experience is a valuable pedagogical technique for developing skills as a practitioner. However, many have also questioned the relative value of experiences, especially those where best practices may not be modeled consistently. Placing students in classrooms where best practices are not modeled could be a disruptive to their learning as the absence of such experience. The types of teacher knowledge as defined by Shulman (1986) can guide the structuring of educative experiences (Dewey, 1904). To best understand how to structure experiences for pre-

service teachers in an educative way requires that we understand not only the knowledge that our students need to gain but also the funds through which they gain that knowledge.

If we accept that teachers learn through practical, theoretical and ethical means, then we are called to structure experiences and teaching that will allow them to do just that. Additionally, we must help them integrate these sources of knowledge to make effective decisions. This means that we must further examine the cumulative learning experiences of our pre-service teachers, specifically how coursework and field work contribute to common goals.

The results of this study indicate Shulman's (1986; 2006) three sources of teacher knowledge (practical, theoretical, ethical) can be combined with Schunk and Zimmerman's (1997; 2007) Model of the Development of Self-Regulatory Skill to inform the development of teacher education curricula (See Table 8). While other developmental models of teacher preparation exist (Snow et al., 2005), they tend to be more linear and account for only one dimension (Ex. Literacy knowledge) of a pre-service teacher's development. Schunk and Zimmerman's (1997) model provides both a conceptualization of development and specific guidance for an instructional sequence including modeling and reflection. Using this model, teacher educators may be able to identify the varying levels of development among the three sources of knowledge, within an individual teaching candidate and provide prompting that is specific to the individual. Additional research is necessary to examine this proposed model and validate its usefulness in developing teacher education curricula.

Table 8

Combined Model for Teacher Preparation

	Theoretical Knowledge	Practical Knowledge	Moral Knowledge
Observation	<p>Model Identification of Theory in Action, provide background in theories</p> <p>Explain how practices follow given theories</p>	<p>Provide strong teacher models for observation</p> <p>Observe teachers – describe actions</p>	<p>Model Decision Making Processes for teaching- Make beliefs explicit</p> <p>Identify/Classify positive/negative practices Begin to express personal beliefs</p>
Emulation	<p>Provide new situations to apply known theories</p> <p>Apply known theories to predict action or explain actions</p>	<p>Provide modeling and opportunities to try</p> <p>Copy actions of teacher, complete actions as directed</p>	<p>Challenge students to move beyond didactic thinking around teaching actions</p> <p>Compare practices, identify positive and negative aspects of the same practice</p>
Self-Control	<p>Provide new theories that challenge previous actions</p> <p>Justify teaching actions with known theories, identify where known theories do not fit</p>	<p>Provide opportunities to teach in new situations (similar but not same)</p> <p>Use student work to inform teaching actions (with time to review)</p>	<p>Provide rich information around teaching situations and support decision making through reflection</p> <p>Approach situations with some ambiguity, seek advice from others when unsure</p>
Self-Regulation	<p>Provide situations that challenge the application of known theories</p> <p>Seek new theories or develop new theories.</p>	<p>Provide opportunities to teach in novel situations</p> <p>Innovate or adjust plan while teaching</p>	<p>Provide realistic teaching situations and access to information.</p> <p>Seek rich information around teaching situations. Balance multiple (possibly contradictory) factors to make teaching decisions</p>

Taking Action: Policy Implications

The field of teacher education has been very busy in recent years responding to mandates that are passed down through legislation and are formed primarily by those outside of teacher education. All education should be based upon specific knowledge of how students learn and teacher education should be no different. Teacher educators must claim their position as leaders and researchers in this critical and developing field. Research related to the process through which pre-service teachers learn should be given just as much attention as those focused solely on outcomes.

Current requirements for teacher education outline primarily the content that must be attained through coursework and the minimum hours for field experiences in teaching. This research would support future policy considerations which merge coursework with field work for increased depth of learning for pre-service teachers. It is clear that pre-service teachers have difficulty observing some critical teaching practices and need scaffolding by experts in the field to make these connections. Merging coursework with field work would allow teacher educators to make explicit connections to theory within the practical experience. It would also provide a space to model the complex teaching decisions that should be grounded in a strong moral compass. Classroom teachers have more than enough responsibility placed upon them and this added role must fall to teacher educators. However, the current structures of teacher education make such partnerships difficult. Teacher education policies should define educative pre-service teaching experiences in a different way that defines the types of experiences they will receive rather than the number of hours they will complete.

REFERENCES

- Akbari, R., & Tajik, L. (2012). Second-language teachers' moral knowledge base: A comparison between experienced and less experienced, male and female practitioners. *Journal of Moral Education, 41*(1), 39-59.
- Ainley, J., & Luntley, M. (2007). The role of attention in expert classroom practice. *Journal of Mathematics Teacher Education, 10*(1), 3-22.
- Bain, A. (2007). The design of inclusive education courses and the self-efficacy of pre-service teacher education students. *International Journal of Disability, Development and Education, 54*(2), 245-256.
- Bain, A., Lancaster, J., Zundans, L., & Parkes, R. J. (2009). Embedding evidence-based practice in pre-service teacher preparation. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, 32*(3), 215-225.
- Baker, E. A., & Wedman, J. (2000). Lessons learned while using case-based instruction with preservice literacy teachers. In T. Shanahan & F. Rodriguez-Brown (Eds.), *Forty-ninth national reading conference yearbook* (pp. 122-136). Chicago, IL: National Reading Conference.
- Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. *Teaching as the Learning Profession: Handbook of Policy and Practice, 1*, 3-22.
- Ball, D. L., & Wilson, S. M. (1996). Integrity in teaching: Recognizing the fusion of the moral and intellectual. *American Educational Research Journal, 33*(1), 155-192.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191.
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*(2), 248-287.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*(1), 1-26.
- Bartell, C. A. (1995). Teacher induction policy in California. *Teacher Education Quarterly, 22*(4), 27 – 43.

- Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry*, 7(1), 1-15.
- Beck, R. J., King, A., & Marshall, S. K. (2002). Effects of videocase construction on pre-service teachers' observations of teaching. *The Journal of Experimental Education*, 70(4), 345-361.
- Berliner, D. C. (1988). Implications of studies on expertise in pedagogy for teacher education and evaluation. *New directions for teacher assessment: Conference proceedings of the ETS invitational conference*. Princeton, NJ: Educational Testing Service.
- Beyer, C., & Davis, E. A. (2009). Supporting pre-service elementary teachers' critique and adaptation of science lesson plans using educative curriculum materials. *Journal of Science Teacher Education*, 20(6), 517-536.
- Björklund, L. (2007, June). The intuitive practitioner: Cognitive aspects on the development of expertise. In *The 13th International Conference on Thinking June 17-21, Norrköping, Sweden*.
- Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology*, 54(2), 199-231.
- Borko, H., & Livingston, C. (1989). Cognition and improvisation: Differences in mathematics instruction by expert and novice teachers. *American Educational Research Journal*, 26(4), 473-498.
- Bransford, J., Darling-Hammond, L., & LePage, P. (2005) Introduction. In L. Darling-Hammond, & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 1 – 39). San Francisco, CA: Jossey-Bass.
- Browder, D. M., Schoen, S. F., & Lentz, F. E. (1986). Learning to learn through observation. *The Journal of Special Education*, 20(4), 447-461.
- Bullier, J. (2001). Integrated model of visual processing. *Brain Research Reviews*, 36(2), 96-107.
- Bullough, R., & Gitlin, A. (2001). *Becoming a student: Linking knowledge production and practice of teaching* (2nd Edition). New York, NY: Routledge.
- Cantrell, D. C. (1993). Alternative paradigms in environmental education research: The interpretive perspective. In R. Mrazek (Ed.) *Alternative paradigms in environmental education research*. Troy, OH: North American Association for Environmental Education.

- Cavanagh, S. (1997). Content analysis: concepts, methods and applications. *Nurse Researcher*, 4(3), 5-16.
- Clark, N. M. (2003). Management of chronic disease by patients. *Annual Review of Public Health*, 24(1), 289-313.
- Clark, C. & Peterson, P. (1986). Teachers' thought processes. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 255-296). New York, NY: Macmillan.
- Clift, R. T., & Brady, P. (2005). Research on methods courses and field experiences. In M. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 309-424). New York, NY: Routledge.
- Colestock, A., & Sherin, M. G. (2009). Teachers' sense-making strategies while watching video of mathematics instruction. *Journal of Technology and Teacher Education*, 17(1), 7-29.
- Corno, L., & Kanfer, R. (1993). The role of volition in learning and performance. *Review of Research in Education*, 19, 301-341.
- Coulter, M. (1966). Concept development and reading instruction. *Education*, 86, 490-493.
- Dalton, S. S., & Moir, E. (1996). Text and context for professional development of new bilingual teachers. In M. McLaughlin & I. Oberman (Eds.), *Teacher learning: New policies, new practices* (pp. 126-133). New York, NY: Teachers College Press.
- Darling-Hammond, L., Hammerness, K., Grossman, P., Rust, F., & Shulman, L. (2005). The design of teacher education programs. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world* (pp. 390-441). San Francisco, CA: Jossey Bass.
- Dewey, J. (1904). The relation of theory to practice in education. In C. A. McCurry (Ed.), *The third NSSE yearbook*. Chicago, IL: University of Chicago Press.
- Dewey, J. (1938). *Education and experience*. New York, NY: Simon and Schuster.
- Duffy, G. G. (2005). Developing metacognitive teachers: Visioning and the expert's changing role in teacher education and professional development. In S. Israel, C. Block, K. Bauserman, & K. Kinnucan-Welsch (Eds.), *Metacognition in literacy learning: Theory, assessment, instruction, and professional development* (pp. 299-314). Mahwah, NJ: Lawrence Erlbaum.

- Erickson, F. (1986). Qualitative methods in research on teaching. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 119-161). New York, NY: Macmillan.
- Ericsson, K.A., & Simon, H. A. (1993). *Protocol analysis*. Cambridge, MA: MIT Press.
- Ertmer, P. A., & Newby, T. J. (1996). The expert learner: Strategic, self-regulated, and reflective. *Instructional Science*, 24(1), 1-24.
- Evans, L. (2002). What is teacher development? *Oxford Review of Education*, 28(1), 123-137.
- Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *The Teachers College Record*, 103(6), 1013-1055.
- Fenstermacher, G. D. (1990). Some moral considerations on teaching as a profession. In J. Goodlad, R. Sodor, & K. Sirotnik (Eds.) *The moral dimensions of teaching* (pp. 130-151). San Francisco, CA: Jossey-Bass.
- Fenstermacher, G. D., Osguthorpe, R. D., & Sanger, M. N. (2009). Teaching morally and teaching morality. *Teacher Education Quarterly*, 36(3), 7-19.
- Goldhaber, D., & Anthony, E. (2007). Can teacher quality be effectively assessed? National board certification as a signal of effective teaching. *The Review of Economics and Statistics*, 89(1), 134-150.
- Good, T., Wiley, C., & Florez, I. (2009). Effective teaching: An emerging synthesis. In G. Dworkin (Ed.), *International handbook of research on teachers and teaching* (pp. 803-816). New York, NY: Springer.
- Hagger, H., Burn, K., Mutton, T., & Brindley, S. (2008). Practice makes perfect? Learning to learn as a teacher. *Oxford Review of Education*, 34(2), 159-178.
- Harste, J. C., Leland, C., Schmidt, K., Vasquez, V., & Ociepka, A. (2004). Practice makes practice, or does it? The relationship between theory and practice in teacher education. *Reading Online*, 7(4).
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Huang, C. T., & Charman, T. (2005). Gradations of emulation learning in infants' imitation of actions on objects. *Journal of Experimental Child Psychology*, 92(3), 276-302.

- Jay, J. K. (2002). Points on a Continuum: An Expert/Novice Study of Pedagogical Reasoning. *Professional Educator*, 24(2), 63-74.
- Johnson, K. E. (1994). The emerging beliefs and instructional practices of pre-service English as a second language teachers. *Teaching and teacher education*, 10(4), 439-452.
- Kane, T. J., Taylor, E. S., Tyler, J. H., & Wooten, A. L. (2011). Identifying effective classroom practices using student achievement data. *Journal of Human Resources*, 46(3), 587-613.
- Kaplan, R. M., & Maxwell, J. T. (1994). *U.S. Patent No. 5,325,091*. Washington, DC: U.S. Patent and Trademark Office.
- Knauff, M., & May, E. (2006). Mental imagery, reasoning, and blindness. *The Quarterly Journal of Experimental Psychology*, 59(1), 161 – 177.
- Kondracki, N. L., & Wellman, N. S. (2002). Content analysis: Review of methods and their applications in nutrition education. *Journal of Nutrition Education and Behavior*, 34, 224-230.
- Korthagen, F. A. (2010). How teacher education can make a difference. *Journal of Education for Teaching*, 36(4), 407-423.
- Korthagen, F. A., & Kessels, J. P. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher*, 28(4), 4-17.
- Lampert, M. (2001). *Teaching problems and the problems of teaching*. New Haven, CT: Yale University Press.
- Leder, G. C., Pehkonen, E., & Törner, G. (Eds.). (2002). *Beliefs: A hidden variable in mathematics education?* (Vol. 31). Dordrecht, Netherlands: Kluwer Academic Publishers.
- Leinhardt, G. (1990). Capturing craft knowledge in teaching. *Educational Researcher*, 19(2), 18-25.
- Lin, X., Schwartz, D. L., & Hatano, G. (2005). Toward teachers' adaptive metacognition. *Educational Psychologist*, 40(4), 245-255.
- Lortie, D. C. (1975). *Schoolteacher: A sociological study*. Chicago, IL: University of Chicago Press.

- Mace, F. C., Belfiore, P. J., & Hutchinson, J. M. (2001). Operant theory and research on self-regulation. In B. Zimmerman, & D. Schunk (Eds.), *Self-regulated learning and academic achievement* (pp. 39-65). New York, NY: Springer.
- Mallette, M. H., Kile, S. R., Smith, M. M., McKinney, M., & Readence, J. E. (2000). Constructing meaning about literacy difficulties: Pre-service teachers beginning to think about pedagogy. *Teaching and Teacher Education, 16*(5), 593-612.
- Marois, R., & Ivanoff, J. (2005). Capacity limits of information processing in the brain. *Trends in Cognitive Sciences, 9*(6), 296-305.
- Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Marzano, R. J. (2009). Setting the record straight on "high-yield" strategies. *Phi Delta Kappan, 30-37*.
- Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). *Classroom instruction that works* (Vol. 5). Alexandria, VA: Association for Supervision and Curriculum Development.
- McPherson, G. E., Nielsen, S., & Renwick, J. (2013). Self-regulation interventions and the development of music expertise. In H. Bembenuddy, T. Cleary, & A. Kitsantas (Eds.), *Applications of self-regulated learning across diverse disciplines: A tribute to Barry J. Zimmerman*. (pp. 355-382). Charlotte, NC: Information Age Publishing.
- Meijer, P. C., Verloop, N., & Beijaard, D. (2002). Multi-method triangulation in a qualitative study on teachers' practical knowledge: An attempt to increase internal validity. *Quality and Quantity, 36*(2), 145-167.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Mewborn, D. (2001). Teachers content knowledge, teacher education, and their effects on the preparation of elementary teachers in the United States. *Mathematics Teacher Education and Development, 3*, 28-36.
- Nilsson, P. (2009). From lesson plan to new comprehension: Exploring student teachers' pedagogical reasoning in learning about teaching. *European Journal of Teacher Education, 32*(3), 239-258.
- Noddings, N. (1992). *The challenge to care in schools: An alternative approach to education*. New York, NY: Teachers College Press.

- Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis, 26*(3), 237-257.
- Özdemir, İ. E. Y., & Pape, S. J. (2012). Supporting students' strategic competence: A case of a sixth-grade mathematics classroom. *Mathematics Education Research Journal, 24*(2), 153-168.
- Paris, S. G., & Winograd, P. (2001). *The role of self-regulated learning in contextual teaching: Principles and practices for teacher preparation*. Washington, DC: US Department of Education.
- Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16*(4), 385-407.
- Pressley, M. (1995). More about the development of self-regulation: Complex, long-term, and thoroughly social. *Educational Psychologist, 30*(4), 207-212.
- Randi, J., Corno, L., & Johnson, E. (2011). Transitioning from college classroom to teaching career: Self-regulation in prospective teachers. *New Directions for Teaching and Learning, 2011*(126), 89-98.
- Rich, P. J., & Hannafin, M. J. (2008). Decisions and reasons: examining pre-service teacher decision-making through video self-analysis. *Journal of Computing in Higher Education, 20*(1), 62-94.
- Sabers, D. S., Cushing, K. S., & Berliner, D. C. (1991). Differences among teachers in a task characterized by simultaneity, multidimensional, and immediacy. *American Educational Research Journal, 28*(1), 63-88.
- Sawyer, R. K. (2004). Creative teaching: Collaborative discussion as disciplined improvisation. *Educational Researcher, 33*(2), 12-20.
- Schön, D. A. (1983). *The reflective practitioner*. New York, NY: Basic Books.
- Schunk, D. H. (2001). Social cognitive theory and self-regulated learning. In B. J. Zimmerman and D. H. Schunk (Eds.), *Self-regulated learning and Academic achievement: Theoretical perspectives* (2nd ed., pp. 125-152). Mahwah, NJ: Erlbaum.
- Schunk, D. H., & Usher, W. L. (2013). Barry J. Zimmerman's theory of self-regulated learning. In H. Bembenutty, T. J. Cleary & A. Kitsantas (Eds.), *Applications of self-regulated learning across diverse disciplines: A tribute to Barry J. Zimmerman* (pp. 1-28). Charlotte, NC: Information Age Publishing.

- Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist, 32*(4), 195-208.
- Schunk, D. H., & Zimmerman, B. (Eds.). (1998). *Self-regulated learning: From teaching to self-reflective practice*. New York, NY: Guilford Press.
- Schunk, D. H., & Zimmerman, B. J. (2007). Influencing children's self-efficacy and self-regulation of reading and writing through modeling. *Reading & Writing Quarterly, 23*(1), 7-25.
- Sherin, B. L., Sherin, M. G., Colestock, A. A., Russ, R. S., Luna, M. J., Mulligan, M., & Walkoe, J. (2010). Using digital video to investigate teachers' in-the-moment noticing. In K. Gomez, L. Lyons, & J. Radinsky (Eds.), *Learning in the disciplines: Proceedings of the 9th international conference of the learning sciences* (pp. 179-186). Chicago, IL: International Society of the Learning Sciences.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4-14.
- Shulman, L. S. (2002). Making differences: A table of learning. *Change: The Magazine of Higher Learning, 34*(6), 36-44.
- Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus, 134*(3), 52-59.
- Shulman, L. S. (2006). Teaching: Foundations of the new reform. *Teacher Education: Curriculum and change, 3*(1), 119.
- Skinner, B. F. (1961). Teaching machines. *Scientific American, 205*(5), 90-107.
- Snow, C., Griffin, P., & Burns, M. S. (Eds.). (2005). *Knowledge to support the teaching of reading: Preparing teachers for a changing world*. Somerset, NJ: John Wiley & Sons.
- Spillane, J. P., Reiser, B. J., & Reimer, T. (2002). Policy implementation and cognition: Reframing and refocusing implementation research. *Review of Educational Research, 72*(3), 387-431.
- Stigler, J. W., & Stevenson, H. W. (1992). *The learning gap: Why our schools are failing and what we can learn from Japanese and Chinese education*. New York, NY: Summit Books.
- Stigler, J. W., & Thompson, B. J. (2009). Thoughts on creating, accumulating, and utilizing shareable knowledge to improve teaching. *The Elementary School Journal, 109*(5), 442-457.

- Stolpe, K., & Björklund, L. (2013). Students' long-term memories from an ecology field excursion: Retelling a narrative as an interplay between implicit and explicit memories. *Scandinavian Journal of Educational Research*, 57(3), 277-291.
- Stoiber, K. C. (1991). The effect of technical and reflective pre-service instruction on pedagogical reasoning and problem solving. *Journal of Teacher Education*, 42(2), 131-139.
- Tan, S., Fincher, M., Manross, D., Harrington, W., & Schempp, P. (1994, April). *Differences in novice and competent teachers' knowledge*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Tomasello, M. (2009). *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- VanderVen, K. (2009) If theory and practice were the same, then what? A new approach to designing professional education. *Child & Youth Services Review*, 31(3), 188-212.
- Weber, R. P. (1990). *Basic content analysis*. Beverly Hills, CA: Sage.
- Zimmerman, B. J. (1994). Dimensions of academic self-regulation: A conceptual framework for education. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and Applications* (pp. 3-21). Hillsdale, NJ: Lawrence Erlbaum.
- Zimmerman, B. J. (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educational Psychologist*, 33(2-3), 73-86.
- Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, 25(1), 82-91.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64-70.
- Zimmerman, B. (2005). Attaining self-regulation: A social cognitive perspective. In Boekaerts, M., Pintrich, P., & Zeidner, M. (Eds.), *Handbook of self-regulation* (pp. 13-39). San Diego, CA: Elsevier.
- Zimmerman, B. & Kitsantas, A. (1999). Acquiring writing revision skill: Shifting from process to outcome self-regulatory goals. *Journal of Educational Psychology*, 91(2), 241-250.