A PHENOMENOLOGICAL STUDY ON THE IMPACTS OF EMBEDDING DISCIPLINARY
LITERACY DURING SCIENCE INSTRUCTION ON ELEMENTARY TEACHERS’
METACOGNITION OF INSTRUCTIONAL TECHNIQUES

By
Kelley Weiss
Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

Liberty University
2016
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ABSTRACT

The educational community has been increasing its focus on literacy for several years. The modern definition of literacy requires students to be an informed and integrated thinker, synthesizing new information beyond the mere ability to read and write (Guzzetti & Bang, 2011). This qualitative phenomenological study focused on how teachers of science view literacy and how that view changes when they implement the concept of disciplinary literacy into science instruction. This phenomenological study examined how teachers became more metacognitive of their instructional methods after implementation of the Question-Answer Relationship strategy (QAR) and direct vocabulary instruction into their science instruction. Teachers utilized schema theory and social cognitive theory to integrate the two strategies into their science lessons throughout the study. This phenomenological study collected data during a six-week implementation period through interviews, observations, teacher journals and collection of artifacts from 12 teachers who taught students in grades one through five and three literacy specialists in a rural central Maine school. These data sources were analyzed using Moustakas’ (1994) seven steps to discover themes that were identified from the data. Findings from this study, as viewed through the pragmatic lens, suggested that teachers benefit from systematic reflection of their teaching to develop literacy rich content area lessons that address all of the students’ learning needs.

Keywords: embedded literacy, disciplinary literacy, scaffolding, schema theory
Dedication

For Chris who supported me through every up and down throughout this process and for helping me see it through to the end. For my girls, Emilie and Natalie, who make me smile every day. For my parents who taught me that I could do anything I set my mind to accomplish.
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List of Abbreviations

Embedded Literacy Instruction (ELI)

English Language Arts (ELA)

Question-Answer Relationship (QAR)

Socio-Economic Status (SES)

United Nations Educational, Scientific, and Cultural Organization (UNESCO)
CHAPTER ONE: INTRODUCTION

Overview

Elementary teachers are responsible for teaching multiple content areas but have focused on teaching them in isolation. In recent years, educators have come to understand that literacy instruction can no longer be limited to reading and writing instruction but must be integrated throughout the curriculum (Faulkner, 2012; Fisher & Ivey, 2005; Guzzetti & Bang, 2011). Implementing literacy strategies throughout the curriculum is not enough to affect long-term change to instructional practice. Teachers must be reflective practitioners and metacognitive about their own teaching experiences (Ellis, Carette, Anseel, & Lievens, 2014). This study focused on the impact implementing two specific literacy strategies into the science content area had on teachers’ metacognition of their own teaching practice. Chapter One provides background, situation to self, purpose, and problem statements. The study itself was outlined with the research questions, significance of the study, the types of data collected, and the method by which the data was analyzed. Chapter One closes with a summary of the chapter.

Background

A 2004 article, written by the United Nations Educational, Scientific and Cultural Organization (UNESCO) education sector, expanded the definition of literacy to include not only reading and writing, but also being able to comprehend what is read and synthesize new ideas from the readings (UNESCO, 2004). With this definition of literacy in mind, educators must broaden how they approach content area instruction. Elementary teachers that include the use of literacy skills in all content areas engage students, and this inclusion of literacy skills is a beneficial way of using class time (Fisher & Ivey, 2005).
During elementary schooling, students learn skills and habits that impact how they process knowledge the rest of their lives. By teaching students how to incorporate literacy skills to improve their comprehension of content area texts during their elementary schooling, teachers are providing students with the ability to naturally access these skills during their later schooling (Cunningham, Perry, Stanovich, & Stanovich, 2004). The question that remains is: How do teachers that have to teach content other than language arts, effectively teach literacy skills that increase metacognitive skills while still focusing on content instruction?

Content area literacy or disciplinary literacy uses not only reading to comprehend content area texts but also writing and speaking to be able to communicate understanding of the concepts being presented (Vacca, Vacca, & Mraz, 2011). The elementary school environment leads itself naturally for being able to teach across disciplines and transfer skills traditionally taught during language arts throughout the content areas. By weaving these skills throughout the content area students not only strengthen their literacy skills but they also gain new ways of articulating their knowledge from other disciplines. An example of this is using literacy skills in math, which allows for students to be able to verbalize the equations and provide them opportunities to write about the effectiveness of using one method versus another for solving a problem (Ming, 2012).

In order for teachers to fully implement disciplinary literacy there are two critical components. The first is that teachers must become more reflective of their instructional methods. By understanding which aspects of literacy instruction would fit in a particular content area, such as having students write about the visual impact of a piece of art work or having them pre-read to determine any vocabulary they are not familiar in their science reading (Ming, 2012), teachers can provide students with instruction that enhances their literacy skills. Being metacognitive of instructional methods also makes teachers more aware of how their own
perceptions impact their teaching (Hayden, Moore-Russo, & Marino, 2013). When teachers are reflective of their practice they can refine instruction and adapt it for students that can provide them with either review or enrichment depending on the students’ needs. The process of reflection can also enhance a teacher’s motivation and increase their retention in the teaching field (Ellis et al., 2014).

The second critical component is that teachers must use specific, research based instructional methods that allow students to draw on previously developed schemas to anchor the new skills (Jewett, 2013). Elementary teachers have an advantage in being able to draw on their training as reading teachers to be able to pull skills that they use in reading instruction and apply them to other content areas. Each discipline has their own specific needs and texts for students to read and comprehend, which means that teachers need to evaluate the literacy skills to determine the appropriate skills and instructional methods to use in specific content areas (Draper, 2002; Shanahan & Shanahan, 2012). The learning must be authentic to the discipline and connected to materials that are content specific (Jewett, 2013). This allows for the students to engage in meaningful learning experiences that will create schema and provide for academic gains.

Understanding the vocabulary, grammatical nuances, technologies, procedures, and cognitive actions used to create and disseminate specific understandings for a subject area are some of the ways to achieve the integration of literacy skills into the content area (Yore, Pimm, & Tuan, 2007). Past practice has been to focus solely on direct teaching of reading and language arts, separating them from other content areas in all grade levels from pre-kindergarten to 12th grade. Recent studies have shown an increasing trend towards using literacy skills in content areas to raise student achievement across both areas (Shanahan & Shanahan, 2012).
There are two methods for literacy skills instruction. The first is a simple integration method that has students apply the skills taught in reading and language arts when reading content-based literature. Integration is a transfer of skills from one subject to another without any direct teaching of the literacy skills (Cervetti, Pearson, Barber, Hiebert, & Bravo, 2007). The second method of instruction is to embed the content area with literacy skills to allow students to gain a conceptual understanding of how to use those literacy skills to interpret information and synthesize it for future use in other subject areas (Vacca & Vacca, 2002). It is the ability to synthesize the information and transfer it to other subject areas that clearly demonstrates student achievement in literacy thus demonstrating disciplinary literacy (Yore et al., 2007).

The issue that arises when teachers are asked to focus on more than content instruction is that the students do not receive as much content as they had in previous years as teachers are asked to incorporate more literacy skills. Teachers agree that the best way for students to acquire knowledge is to read and write about the content area (Ming, 2012); however, content area teachers do not feel they should have to instruct students in how to read or write (Fisher & Ivey, 2005, p. 4-5). There is a gap in the literature concerning lack of understanding about how the teachers’ understanding of disciplinary literacy skills impacts their teaching techniques.

**Situation to Self**

The motivation for this study came from my search to find ways to increase teacher metacognition of instructional strategies and to have teachers reflect on how his or her instruction is impacted by participating in professional development. As a principal, I wanted to provide my teachers with opportunities to grow and develop as professionals. Being able to provide opportunities for teachers to receive professional development became a priority for the
district, as the state of Maine had passed laws that state that teachers’ and administrators’ evaluations must be linked to student achievement and growth in all subject areas. These laws placed increased pressure on educators in the state to ensure that students made adequate growth each year.

Prior to being an administrator, I was a science teacher who recognized the importance of integrating literacy into the science curriculum and helping students be able to read all types of texts from scientific textbooks to research articles. There was a potential for my own excitement for the use of disciplinary literacy and embedded vocabulary to color the teachers’ view of the teaching technique. I needed to act as an objective observer rather than a participant observer.

This research provides other administrators insight into how teachers view the implementation of new instructional strategies and provides a new direction for further research. Research on how teachers view the impacts of implementation of the Question-Answers Relationship (QAR) method has been very limited at the elementary level. With the increased focus on connecting teacher evaluation to student achievement, it is important to understand how teachers view their own impacts on student achievement. Overall this research helps educational professionals plan professional development that is beneficial to teachers and students by taking into account how the teachers’ views impact the success of the implementation.

**Problem Statement**

The exploration of disciplinary literacy at the high school level has shown an increase in student comprehension of content-based texts (Anthony, Tippett, & Yore, 2010; Damico, Baildon, Exter, & Shiau-Jing, 2009; Williams, Stafford, Lauer, Hall, & Pollini, 2009). This integration of literacy skills in the content area, specifically science, has demonstrated that ELA teachers are not solely responsible for students developing literacy skills (Fisher & Ivey, 2005;
McClune, Alexander, & Jarman, 2012). There has been very little critical exploration of the use of disciplinary literacy at the elementary grades and there is a gap in the literature around the impact a teacher’s understanding of disciplinary literacy can have on their own instructional methods. A study examining the impacts of teacher metacognition on student achievement was completed during the Read-Write project and demonstrated a positive effect on student achievement (Curwen, Miller, White-Smith, & Calfee, 2010). This phenomenological study provides insights into how disciplinary literacy strategies can impact a teacher’s understanding of literacy instruction and their metacognitive thinking about instructional strategies.

At present, there are few studies that focus on the impacts of the QAR strategies combined with embedded vocabulary literacy instructional methods on primary grade teachers’ metacognitive understanding of literacy instruction. This study builds on the research completed by Wilson, Grisham, and Smetana (2009) that examined how a yearlong professional development program using the QAR strategy impacted teacher understanding of disciplinary literacy in content area instruction. This was achieved by examining the impacts on teachers’ metacognition of their teaching practices after they had implemented the QAR strategy and embedded vocabulary instruction during their science lessons.

**Purpose Statement**

The purpose of this phenomenological study was to understand how implementing disciplinary literacy into the science content area impacts primary grade teachers’ metacognition of disciplinary literacy at Cole Elementary School. Disciplinary literacy was generally defined as the concept of integrating reading and comprehension into the content-specific classes. Teachers guide students through readings, discussions, and connecting concepts in order for
them to navigate more complex texts and acquire a deeper understanding of the content (Norton-Meier, Hand & Ardasheva, 2013).

The theory that guided this study was the social cognitive theory by Vygotsky (1978). Traditionally, teachers access students’ optimal learning of a new skill by placing a student with a teacher or student who has already mastered the skill. Teachers can also enter the zone of proximal development to grow as professionals as they learn from each other and their students. In studies completed at the secondary level, the use of disciplinary literacy has shown to be effective for increasing teacher awareness of both metacognitive thinking and content instruction (Wilson et al., 2009). The recent adoption of Pearson Interactive Science and the addition of a literacy specialists to the Cole elementary faculty has allowed for the school-wide professional development necessary to implement new teaching strategies.

The secondary purpose of this study was to develop an understanding of the teachers’ experiences based on their use of the QAR literacy strategy and direct vocabulary instruction during science instruction. The QAR is generally defined as a strategy that instructs students on where to find answers to comprehension questions (Raphael, 1982). The theory that guided this purpose was schema by Piaget (1964) and Anderson (1978). As teachers connect prior student learning to the new strategies being implemented they access the schema students have put in place, which has been examined by recent research on using the QAR method. At the primary level the research is very limited, and the majority of that research focused on student achievement instead of examining how QAR impacts teachers as they implement the literacy strategy (Kinniburgh & Prew, 2010). The study was also viewed through the lens of Pragmatism (Dewey, 1904). Using the logical approach of the pragmatic lens to frame the teachers’
experiences of implementing the literacy strategies illuminates how the experiences impact how teachers view their own instruction.

**Significance of the Study**

The study provided significance empirically, theoretically, and practically in the area of disciplinary literacy, specifically the implementation of literacy in science instruction. The significance is applicable to both the development of teaching practice as well as the theoretical basis of the study.

**Empirical Significance**

This study provided empirical significance through the data gathered from examining the shared experiences of teachers as they implemented a new instructional strategy into their classrooms. The study provides new insights into how teachers respond to incorporating literacy into the content area, specifically focusing on using the QAR strategy with direct vocabulary instruction to deepen comprehension. By using an empirical approach to analyze the teachers’ experiences, the essence of the experience was captured through rich descriptions. These descriptions were developed through reflective structural analysis that occurred when individuals relived the experience and examined how they were impacted by the experience (Moustakas, 1994). This study provides empirical data about the experiences of elementary teachers implementing the QAR strategy with direct vocabulary instruction into their science instruction.

**Theoretical Significance**

This study had theoretical significance, as teachers are now required to implement new teaching methods to ensure that students are able to read and comprehend content area texts. Teachers have to incorporate literacy instruction into all content areas and be creative in their instructional strategies so that all students are able to make academic growth. This research
provides teachers an outlet to examine their experiences incorporating a new instructional strategy and the impacts of using that strategy on their beliefs, thoughts, and feelings about instruction. Their experiences build the framework for identifying theoretical changes in instruction.

**Practical Significance**

The practical significance of this study was demonstrated by combining literacy with science to provide teachers more opportunities to integrate literacy skills into disciplinary instruction and for students to have exposure in learning to comprehend texts with higher lexile levels. This combination of content area instruction and literacy has led to higher academic gains for students (Shanahan & Shanahan, 2012) and has led to teachers examining their practice more reflectively in order to be more creative in their instructional strategies (Wilson et al., 2009). As a result of increased pressure from new state regulations that tie student achievement and growth to teacher evaluations, teachers are searching for new instructional strategies to ensure increased student achievement and growth across the curriculum. This study provides insights into how teachers’ experiences and metacognition of instructional strategies shape their instruction.

**Research Questions**

For this phenomenological study, five questions drove the focus of this research. These questions related to my interest in understanding how implementing disciplinary literacy skills impact the overall instruction the teacher provides to students and whether or not the teacher changes their instruction due to the implementation of new skills.

**RQ1:** How does implementing literacy strategies into science change teacher metacognition of disciplinary literacy?
For teachers to be effective they must understand how their thinking changes as they implement a new strategy and their expertise of both the strategy and the subject area develops. Metacognitive awareness of this change can impact how the teachers react to implementing new strategies and how they implement those strategies (Wilson et al., 2009). The process of systematic reflection guided teachers into greater metacognitive awareness of their teaching practice (Henry, Bastian, & Fortner, 2011). Through the theoretical lens, engaging in reflection is a pragmatic way to encourage professional improvement in teaching practice.

**RQ2:** How would teachers describe the experience of implementing the QAR and embedded vocabulary literacy strategies into science instruction?

For any literacy strategy to be effectively implemented and maintained in content area instruction teachers must be comfortable with the strategy themselves and be given the time to collaborate with their colleagues to work through problems that may arise during implementation. Vygotsky’s (1978) social cognitive theory focused on having individuals enter the zone of proximal development when working with others allowed for the learner to develop new strategies. The ability for teachers to learn from others during the training and implementation process allowed for further professional growth. Teachers also must feel that their expertise in the content area must acknowledge for its value as highly as the literacy instruction is valued (Cantrell, Burns, & Callaway, 2009). When teachers feel that the content is central in instruction their use of literacy strategies to deliver the instruction is adapted and used willingly (Wilson et al., 2009).

**RQ3:** What do teachers perceive to be the benefits and drawbacks of the QAR and embedded vocabulary literacy strategies?
The QAR is an instructional strategy that can provide teachers with a plan for engaging students in higher order thinking. This type of thinking engages the students in activating prior knowledge and helps students to build schema that anchors the new knowledge (Okebukola & Owolabi, 2007). The use of students’ schema can help them to assimilate the new knowledge at a faster rate (Anderson, 1978). While the initial preparation for using this strategy make take extra time, the benefit of being able to spend less time working on questions that are fact and more time deepening student comprehension is significant (Kinniburgh & Shaw, 2009). Identifying the benefits and drawbacks to the specific strategies provides teachers with a logical means for classroom planning. This pragmatic approach follows Dewey’s (1905) theory for planning student learning.

**RQ4:** What additional resources would have made an impact in implementing disciplinary literacy?

In order for implementation of new instructional strategies to be effective and maintained, teachers need to feel supported. When implementing the QAR strategy teachers felt that having access to instructional resources such as samples would help them implement the program more effectively and give them more time to focus on instruction instead of creating the materials for class (Raphael & Wonnacott, 1985).

**RQ5:** What obstacles exist in implementing the QAR and embedded vocabulary strategies?

Each teacher may encounter different elements in their classroom that may impede the implementation of a strategy. It will be important to identify these elements to ensure that if the strategy is used in another school they are aware of the obstacle to plan for it in their
implementation. The pragmatic view allows for teachers to logically understand what kept the literacy strategies from being implemented and if those obstacles can be overcome in the future.

**Research Plan**

This phenomenological study was conducted in a small rural school in central Maine to explore the educational impact of implementing disciplinary literacy with instruction focused on embedded literacy skills. The participants were 12 elementary teachers who taught students ranging from kindergarten to fifth grade all of who had used the Pearson Interactive Science program for two years and the three school literacy specialists. This qualitative approach was appropriate because phenomenological qualitative design allowed for the study of the phenomenon or experiences of a group of individuals (Creswell, 2013). The teachers developed two specific disciplinary literacy skills and integrated them into their classroom throughout a six-week implementation. Throughout the duration of the implementation teachers reflected on how the integration of skills impacted their instructional methods. This study included teacher interviews, documents and artifacts, as well as classroom observations to examine how the teachers’ understanding of disciplinary literacy skills affected their overall teaching methods. The three literacy specialists were interviewed about their support of the teachers during the implementation period. After the data was collected it was analyzed using Moustakas’ (1994) seven steps to analyze the data for possible trends in the teachers’ perceptions of their teaching methods. Moustakas’ (1994) seven steps are: creating lists and developing initial grouping, reduction and elimination, clustering and identifying themes of the invariant elements, finalizing the invariant elements and themes by application, constructing individual textual descriptions, constructing of individual structural descriptions, and constructing an individual textual-structural description of the meanings and essences of the experience for each participant.
Delimitations

The delimitations are the set of parameters established for a study (Creswell, 2002). For this study, the delimitations are the specific selection of kindergarten through fifth grade teachers who taught science due to the recent implementation of the Pearson Interactive Science program. This implementation meant that all the teachers were using the same science curriculum. The school was selected because the teachers were working with a literacy coach to improve literacy practices in the classrooms. The teachers in this study were all general education classroom teachers. The special education teachers did not teach science; therefore, they were not selected to participate in the study.

Definitions

1. **Content area literacy** - Acquiring new knowledge in a specific content area through reading, comprehension, writing, and critical thinking about the content. Teachers use literacy skills, specific content-based skills (writing lab reports or reading technical manuals), and prior knowledge to attain literacy in the content area (Connor et al., 2010).

2. **Curriculum** - The lessons or content taught in a particular subject area or the overall content taught during the school day (Vacca et al., 2011).

3. **Criterion** - A defining characteristic for a particular group or sample (Creswell, 2013).

4. **Criterion Based Sampling** - Criterion sampling is used to recruit participants that match a specific set of criteria needed to match research objectives (Creswell, 2013).

5. **Direct Instruction** - Explicit teaching of a specific skill or skill set using defined method of instruction (Justice & Kaderavek, 2004).
6. **Disciplinary literacy** - Disciplinary literacy is the concept of integrating reading and comprehension into the content-specific classes. Teachers guide students through readings, discussions, and connecting concepts in order for them to navigate more complex texts and acquire a deeper understanding of the content (Norton-Meier et al., 2013).

7. **English Language Arts (ELA)** - The content area that specializes in reading, writing, listening and speaking (Indiana DOE, 2014).

8. **Higher-order thinking** - This type of thinking engages the students in activating prior knowledge and helps students to build schema that anchors the new knowledge (Okebukola & Owolabi, 2007).

9. **Instructional strategies** - Methods used in the classroom to promote student engagement and critical thinking skills (Anthony & Tippett, 2010).

10. **Lexile levels** - A unit of measurement to determine a student’s reading level and their ability to comprehend the text (Shanahan & Shanahan, 2012)

11. **Metacognition** - Teachers develop an awareness and understanding of their thought processes around how they plan for instruction and teach student (Curwen et al., 2010).

12. **Question-Answer Relationship (QAR)** - A strategy that instructs students on where to find answers to comprehension questions (Raphael, 1982).

13. **Reading comprehension** - The ability for a student to read, process, and comprehend the meaning of a text (Connor et al., 2011).
14. **Systematic reflection** - Systematic reflection as defined by Ellis et al. (2014), as “a learning procedure during which learners comprehensively analyze their behavior and evaluate the contribution of its components to performance outcomes” (p. 5).

**Summary**

The increased focus on literacy has forced schools to look at new ways to integrate literacy skills into the curriculum in areas other than English and Language Arts (Ming, 2012; Vacca et al., 2011). One method used to integrate literacy skills is to focus on disciplinary literacy where teachers used content area instruction to provide students an opportunity to use literacy skills to read and comprehend texts based in the content area.

Through the use of the QAR strategy with direct vocabulary instruction, teachers provided students with skills to deepen their reading comprehension. This phenomenological study focused on the experiences of 12 teachers as they implemented the learning strategies into their science content area instruction and the three literacy specialist who supported the teachers during implementation. The study is significant because it demonstrated the successes and challenges teachers faced when implementing a new learning strategy into their science lessons. It provided insight as to how teachers who taught science viewed their teaching and the changes they made as they worked through the challenge of implementing disciplinary literacy in the elementary setting.
CHAPTER TWO: LITERATURE REVIEW

Overview

This study was undertaken with three major theoretical worldviews used to develop the theoretical underpinning for the study: schema theory, social cognitive theory, and pragmatism. These worldviews focused the study on examining how teachers viewed instruction and their students’ abilities to learn new concepts. By understanding how the teachers view instructional strategies and their impacts on student achievement, administrators can understand how to best help teachers refine their instruction. Without growth and refinement of their instructional strategies, teachers become stagnant and complacent in their positions (Hayden et al., 2013).

Administrators are asking more of teachers in terms of being effective educators and providing students with a deeper education, rather than facts for students to regurgitate. Teachers are being asked to incorporate new strategies that engage students in higher level thinking and are required to use all levels of Bloom’s taxonomy to demonstrate their knowledge (Luebke & Lorié, 2013). This has led to researchers studying questions about students’ ability to decipher new vocabulary and concepts in content-specific classes. Current studies in disciplinary literacy, vocabulary, and teaching specific literacy skills all demonstrate that the key is to provide contextual meaning upon which students build their knowledge base because without the contextual meaning, the new knowledge is not anchored in the students’ memories (Boyd, Sullivan, Popp, & Hughes, 2012; Cox, Jackson, & Tripp, 2011).

These studies were primarily quantitative studies that compared student achievement before and after the skills were taught. The overall findings were very positive but were not based on long-term examples to determine if the gains were maintained (Guzzetti & Bang, 2011; Israel, Maynard, & Williamson, 2013). The studies primarily focused on student achievement
and a few studies focused on the impacts of professional development around the implementation of new instructional strategies. There is a very limited amount of qualitative studies that examined how a teacher’s understanding of literacy is impacted through instructional adaptations.

Schools are constantly seeking ways to improve student achievement. Multiple studies revealed that increases in vocabulary skills coincide with improved comprehension skills. The following review of the literature demonstrates, by supporting the content areas with direct literacy instruction, student achievement simultaneously increases in literacy and the content area. By combining the vocabulary instruction with enhanced literacy instruction in the content area, a student’s overall achievement should also increase (Robb, 2014). This increase would be further enhanced when teachers understand how their own instruction changes as they become more familiar with the skills that they are teaching through systematic reflection (Ellis et al., 2014; Hayden et al., 2013). A qualitative study by Hayden et al. (2013) demonstrated that as a teacher reflected on their own teaching practice their effectiveness as an instructor increased and that they became more attuned to their students’ needs.

Teachers who engage in systematic reflection learn not only from their mistakes but also from their success in the classroom. Research completed by Broyles, Epler, & Wakhnine (2011) with pre-service teachers noted that when given time to reflect on lessons and then teach the lesson a second time the teachers were able to develop materials that were at a higher cognitive level. A secondary impact was teachers developing a greater efficacy and increasing their commitment to the teaching profession when they employed systematic reflection of their teaching practice.
Part of this reflection is having an awareness of factors that may inhibit student learning such as the impacts of poverty on their language acquisition, their working vocabulary at school age, and their reading ability (Lee, 2009). Students that come from poverty experience delays that their peers in non-impoverished homes do not exhibit. These language delays impacts both their ability to develop their reading ability and their ability to comprehend what they are reading (Price, 2010). When teachers reflect upon their lessons and the manner in which they deliver these lessons they are able to gain an understanding of the instructional needs of their students. Developing this metacognition of their instructional strategies allows teachers to be more effective and for students to make more educational gains.

**Theoretical Framework**

There are several major worldviews that shaped this study, including Piaget’s (1964) and Anderson’s (1978) use of a schema to build scaffolding for knowledge, Vygotsky’s (1962) ideas on language being developed by understanding the meaning behind words along with students learning while in the zone of proximal development, Dewey’s (1904) pragmatist view of how this knowledge can be used to further student academic growth, along with Dewey’s (1905) lens of pragmatism to examine how teachers solve problems in education.

Questions addressing students’ ability to decipher new vocabulary and concepts in content-specific classes can be answered by examining the schema students learn during their school years and understanding how associating meaning of words can further their language development. The gains students can achieve by working with other students who already possess the skills they are trying to learn and the gains that students can acquire by working directly with the teacher are achieved through Vygotsky’s zone of proximal development. Current studies in disciplinary literature, vocabulary, and teaching for transfer all prove that the
key is to provide students with contextual meaning upon which to build their knowledge base without the contextual meaning; the new knowledge is not anchored in the students’ memories.

**Schema Theory**

Piaget (1964) stated that true learning could only occur when students are actively involved in acquiring new knowledge and making connections. Each new schema a student experiences is either assimilated into existing schemas or makes accommodations to prior schemas to make it fit the current experience. Piaget viewed each piece of knowledge like a building block, and for this study, the vocabulary lessons were the building blocks that teachers used to help develop student comprehension (p. 184-185).

Piaget’s (1964) schema theory is typically the theoretical basis used for the technique scaffolding instruction. In the classroom, teachers who build on prior schemas of knowledge support their students until the knowledge is firmly secure and then build upon that new knowledge. When the new concepts become known, the teachers move the supports to provide structure for the next new concept (Rodgers & Rodgers, 2004). This is often done by moving the students through the levels of Bloom’s taxonomy, first focusing on knowledge acquisition and then moving to applying that knowledge before finally synthesizing and evaluating the knowledge into new concepts. The direct utilization of the connections that Piaget described in his schema theory is what makes it possible for teachers to move students along Bloom’s Taxonomy (Luebke & Lorié, 2013).

Anderson (1978) expanded the schemata theory with examining the concept from an educational perspective. Anderson felt, like Piaget, students assimilate the new knowledge into prior held concepts. If students do not have the prior schema in place they will struggle to learn new the new concepts. This is applied in terms of reading where students must have an idea of
the meaning of words in order to comprehend what they are reading. Reading is not solely about being able to understand what word is formed by groups of letters but also how words fit together in sentences to convey a specific meaning to the reader (McVee, Dunsmore, & Gravelek, 2005).

Teachers use the schema theory in their classrooms by first activating their students’ prior knowledge and using it as a base for anchoring the new knowledge presented in the classroom lessons. During direct vocabulary instruction teachers use scaffolding to support learning by asking students what connotations a word may have as well as any known meanings they may already associate with certain words. This type of instruction is key when looking at the roots, suffixes, and prefixes that a word may contain. Robb (2014) established that vocabulary instruction is key to comprehension of complex texts and by using direct vocabulary instruction to scaffold student learning, teachers are able to move beyond the surface with students so they can fully understand the meaning of what they are reading.

Students that come from low-income homes have a different learning schema than other students. These students are not exposed to language or literacy activities during their early development years and, therefore, do not have the scaffolding needed to be successful during early schooling. In order to compensate for this lack of scaffolding, teachers must develop a learning community that is supportive of all readers by providing academically appropriate activities that allow for students to develop their identities as readers. Skill-building activities can reinforce the classroom lessons, by creating opportunities for parental involvement in the classroom while engaging families in literacy activities both in and out of the classroom (Bhattacharya, 2010).
Social Cognitive Theory

In 1962, Vygotsky first proposed that a child’s language and word selection becomes richer as they are able to associate meanings to the words. There is a dynamic relationship between a student and their language development. As they gain life experiences their ability to put words to their thoughts grows. Each experience allows students to create an internal network of connections between words. It is this set of internal connections that allows students to verbalize their thoughts (Vygotsky, 1962).

Vygotsky’s (1978) social cognitive theory is based on students being able develop new skills by working with another person either student or teacher that already possess the skill set. The student must be ready to learn the skill set they are seeking to acquire by possessing the background knowledge required to learn the new skill. In terms of acquiring disciplinary reading skills, both schema building and social cognitive theory with a focus on using the zone of proximal development for learning, are used by students to first gain the skills through working with peers and then anchor them by developing a schema for using them (McVee et al., 2005). These theories are not mutually exclusive in student learning; instead, they build on each other to create a complex structure for student knowledge acquisition.

Elementary schools are environments that breed social learning from a student’s earliest experiences in school. Not only do students sit at tables so they can collaborate, but they are often paired or grouped to enrich their learning experiences. Teachers pair students who have a deeper understanding of the concept with students who are still trying to develop their understanding of the concept to help the student learn by the example of their peer. This learning from the experience of others is demonstrated in both formal classroom settings and in activities such as book buddies, where older students are paired with younger students to develop their
reading skills while the younger students learn about print concepts. Whether formal or informal, these cooperative learning experiences provide students with valuable opportunities to improve upon existing skills.

This is true about teachers learning as well, for they are grouped in grade level teams and often work together when learning about new instructional strategies or planning the implementation of the curriculum for a particular unit. For this study teachers worked with a literacy coach in the classroom to properly implement new instructional strategies in their classroom, which was a social learning strategy that required students to work with each other and the teacher to build on their prior knowledge. This is why social cognitive theory was one of the primary assumptions for this study.

**Pragmatism**

Dewey (1905) established the pragmatic theory to guide educators in using logic and truth to problem solve in education. This study used the pragmatic lens to emphasize how teachers engage students in the process of learning literacy skills and direct vocabulary in the content area through logical and reasonable methods of problem solving. When teachers assess students to determine which skills students are lacking and provide direct instruction of those skills, they can provide a practical solution for impacting student achievement. Dewey stated that in order to affect change within a system the person involved in the change must have an interest in making the change.

The pragmatic viewpoint is also relevant because there is a finite amount of time during the school day and a finite amount of resources that schools have access to in order to affect change within the school. Dewey’s (1905) theory of logical problem solving means that educators must use the resources that they have available to them to solve their problems and
plan for student learning. With reduced budgets and higher expectations teachers must use their classroom time wisely to provide students with the best opportunity to achieve. Teachers can no longer teach subjects in isolation and expect students to meet all the learning objectives because students are now required to apply skills across multiple subject areas. There is not enough teaching time during the day for teachers to instruct students using the same skills in each subject; therefore, skills must be taught so they are transferrable.

The teachers involved in this study had been under pressure for the last three years to increase their student achievement scores in literacy. This has led to many sweeping changes that have been top down and forced teachers to examine their instructional practices. The teachers have recognized that changes are needed and have come to the understanding that they must change their instructional strategies in order to help their students make their achievement goals. The teachers have developed a pragmatic view that these changes will have to be enacted in order for the school to maintain their current levels of funding and staffing.

**Summary of Theoretical Framework**

This study was focused through the lens of pragmatism to determine how the teachers’ metacognition of their teaching is impacted through learning about disciplinary literacy and how it impacts the students in their classroom. Teachers engage their students in connecting to prior schema to build their literacy skills and provide the learning environment for students to develop their vocabulary through contextual basis.

By scaffolding the vocabulary instruction into the science lessons, the teachers provide students with a basis to develop a deeper comprehension of the concepts they are learning and allow them to access higher levels of Bloom’s taxonomy (Luebke & Lorié, 2013). This scaffolding will be, as envisioned by Anderson (1978) in his schemata theory, a way to have
students connecting the knowledge the teachers have taught prior to the current material they are reading. The vocabulary will act as a bridge to help students develop a deeper comprehension.

Connecting with colleagues creates the zone of proximal development that provides teachers with a chance to learn from other professionals that may have used certain instructional techniques that they are trying to develop themselves. Teachers will work through the zone of proximal development to build their own knowledge around disciplinary literacy through professional development opportunities. They will then use those developed skills to access the students’ schema around the content and previous reading comprehension skills. The teachers engage the students in their individual zone of proximal development to develop those comprehension and vocabulary skills. By understanding how that instruction can impact their students the teachers can adapt their instruction to meet their students’ needs.

**Related Literature**

This study examined the elementary teachers’ view of their instruction and if it changed as they implemented an instructional strategy that introduced disciplinary literacy skills into their science class. Teachers kept a journal during the length of the study, were interviewed, and observed to gain a complete picture of their experience and their thoughts. The intent was to gain insights into how teachers viewed their own ability to provide instruction and what impact that had on their abilities to be an effective educator.

The literature reviewed for this study focuses on the use of disciplinary literacy to increase students’ comprehension of content area readings, and the use of direct vocabulary instruction to enhance disciplinary literacy while taking into account the impacts of poverty on literacy instruction and student achievement (Dorn & Jones, 2013; Robb, 2014). These areas are all focused through the lens of teachers being metacognitive of their instructional strategies and
using systematic reflection to reform their instruction to meet the needs of their students (Whittaker & van Garderen, 2009). By examining each of these areas through the impact they have on classroom instruction, an overall picture of how teachers’ understanding of specific instructional methods can impact the teachers’ view of their classrooms and their students’ abilities to learn new concepts.

There are five major sections in the literature review that provide a picture of the impacts of using specific instructional methods, the effects of poverty on student achievement, and how teacher reflection can increase motivation and engagement in the classroom. The first section of the literature review defines disciplinary literacy and the current research that supports the need for an integral approach for teaching literacy skills. The review then details the instructional strategies behind the QAR method, direct vocabulary instruction, and the benefit of using them in content area instruction. An examination of the impacts of poverty on a student’s ability to learn is included because the location of the study was in an area of high poverty. The final section of the review details the effects of teacher reflection on their practice and their motivation to stay in the teaching profession. By understanding these areas, a complete picture can be developed to understand the population of students, teachers, the school participating in the study, and the instructional methods being implemented. This picture can then be used to examine the impacts of the mindset of the teachers when implementing new instructional methods.

**Disciplinary Literacy**

Disciplinary literacy is the concept of integrating reading and comprehension into the content-specific classes. Teachers guide students through readings, discussions, and connecting concepts in order for them to navigate more complex texts and acquire a deeper understanding of
the content. In a study by Norton-Meier, Hand, & Ardasheva (2013), teachers found, “A more complex conceptual understanding of science content through argumentation, an increased motivation to engage in literacy events and a stronger use of writing,” when using disciplinary literacy frameworks in both math and science classrooms (p. 47).

Multiple studies have identified two components for proper implementation of these frameworks. The first component is developing the use of inquiry-based literacy in the classroom. Students use texts as ways to anchor their knowledge and build upon this knowledge with their own ideas (Faulkner, 2012; McClune et al., 2012; Norton-Meier et al., 2013). A case study by Faulkner (2012) presented, “many key literacy strategies were helpful in breaking the learning into smaller steps and making the content more accessible to students” (p. 3). With accessible content students can then apply the knowledge to gain a deeper understanding of the subject area and make cross-curricular connections to prior learning (p. 3). It is through the use of this teaching methodology that teachers are developing a greater understanding of the benefit the students receive by incorporating literacy strategies into their instructional time (Damico et al., 2009).

The second component is to provide a solid purpose for the work being done by students, “Purpose driven work increased student motivation to engage in literacy events” (Norton-Meier et al., 2013, p. 48). Students who have a clear goal and purpose will begin to assume responsibility for their learning and seek out opportunities to develop their skills. As demonstrated in the research by Guzzetti and Bang, “Girls in the literacy-based group became more interested in science…they engaged with texts that allowed them to take an active role in solving problems” (2011, p. 55-56). When teachers provide students with a direction for their learning and explain the purpose of learning particular skills students become more engaged in
the classroom. This engagement leads to further academic achievement for the students and increases the students’ confidence as learners (Anthony et al., 2010; Guzzetti & Bang, 2011; Israel et al., 2013).

The majority of the research was conducted in science classrooms and a few social studies classrooms. This was not unusual because of the vast amount of content reading found in these subject areas. Science also has more research-generated technical reading that can be difficult for students to navigate and teachers must provide guidance for students in how to interpret these readings (Israel et al., 2013, p. 18). There are two styles of disciplinary literacy currently being studied. The first is an embedded literacy approach where teachers used instructional scaffolding to support both the science instruction and the literacy instruction. The second approach is a cross-curricular approach, which involves students applying the skills they gain in their English and Language Arts classes to their other disciplines.

**Embedded literacy approach.** Embedded literacy is the act of creating meaningful opportunities for students to apply literacy skills throughout their day. The distinct value of utilizing direct instruction to increase student knowledge in both the subject area and literacy skills is that students are able to make authentic connections with the material (Justice & Kaderavek, 2004). Connor et al. (2010) and Anthony, Tippett, and Yore (2010) developed studies that accessed the students’ prior knowledge to help them engage in creating new connections. These connections were solidified through in-class discussions that required them to analyze, draw conclusions, and write about their learning. Instead of developing curriculum that would teach the discipline in isolation, the lessons required students to use their vocabulary acquisition skills that teachers supported by making contextual connections, anchoring the students’ knowledge, and creating scaffolding for new knowledge. Scaffolding is then used to
develop the students’ compare and contrast skills along with graphic organizer and language skills (Williams et al., 2009).

The impacts of this method were felt more by teachers who taught more than a singular discipline. Multi-discipline teachers were able to track the students’ use of skills and refer them back to previous lessons to trigger those literacy skills (Anthony & Tippett, 2010). Teachers who did focus on a singular discipline needed to provide the scaffolding in the class without being aware of the previous skills the students had learned prior to coming to their class. This was seen as a drawback for using disciplinary literacy because it required the teacher to focus beyond their own content curriculum to include literacy skills. The need for content area embedded literacy is further accentuated by the methods texts used to educate content area teachers that stresses the importance of teachers supporting students in the effort to make them stronger readers. However, the texts do not provide any examples on how to support this in the content area (Draper, 2002).

**Cross-curricular approach.** The cross-curricular approach draws upon skills that students have learned in previous literacy classes and applies them to other disciplines. Discipline-specific classes in the cross-curricular approach do not teach literacy skills, and there is an absence of scaffolding that is in place for embedded literacy classes. The discipline-specific classes focus on literacy as a means of showcasing the student’s knowledge of the content instead of partnering the literacy skills and content to develop comprehension and writing skills.

There are two distinct processes which must occur in order to properly integrate literacy instruction into the content area lessons (Norton-Meier et al., 2013). First, teachers must construct lessons that focus on inquiry-based learning that incorporates literacy skills through
social learning. Secondly, they must create an environment in which the students are responsible for their own learning using critical thinking skills to draw conclusions and make inferences to establish connections between prior knowledge and new understandings. Guzzetti and Bang (2011) demonstrated that as students gained confidence in using their literacy skills, their enjoyment for the content area increases. Additionally, Damico et al. (2010) ascertained that the use of these literacy skills helped students tap into prior knowledge and relate their own cultural understandings when establishing new knowledge connections.

Question Answer Relationship Strategy

The QAR is a strategy that instructs students on where to find answers to comprehension questions. The method focuses on two question types, *In the book* and *In my head*, that students are asked after reading a selected text. The objective is for students to be able to identify what each question is asking them and understand where they should look to find the answers. By teaching students the relationship between the texts they are reading and the comprehension questions they are asked, students can work through complex texts and deepen their comprehension of the texts (Raphael, 1982).

The two categories of questions, *In the book* and *In my head*, are broken down into two subcategories each. The two sub-categories for *In the book* questions are: right there and think and search. The two sub-categories for *In my head* questions are: on my own or author and me (Helfeldt & Henk, 1990). The *In the book* questions focus on having students search the texts for answers, with the “right there” questions being found in a single line that the students read in the text. They do not require any in-depth connections to be made and are used to check if the student had read the text or to draw their attention to a particular key item in the text. The “think and search” questions require students to gather information from several different areas of the
text to complete activities such as compare and contrast or describe and sequence (Raphael & Au, 2005).

The In my head questions require students to relate the question back to themselves and incorporate their own experiences into the answer. The “author and me” sub-category asks the students to apply what they have read and combine it with their own experiences to develop their answer. The On my own sub-category requires students to completely rely on their own experiences and knowledge to answer the questions. The questions could also ask students to explain how the text makes them feel or their opinion of a particular point made by the author of the text (Raphael, 1986). When used appropriately, the QAR method strengthens students’ comprehension by guiding them through knowledge building and applying knowledge with In the book questions and progressing to synthesizing and evaluating with On my own questions (Raphael & Au, 2005).

**Development of the QAR.** Raphael (1982) developed the QAR strategy in the 1980s based on work completed by Pearson and Johnson on the taxonomy of questions. Pearson and Johnson (1978) suggested that there is a relationship between the question being asked, the text the question refers to, and the reader’s prior knowledge. Raphael’s initial development of the QAR began by examining the question from three different lenses: what question is being asked of the reader, how does it apply to the text, and does the reader need prior knowledge to answer the question (McIntosh & Draper, 1995; Raphael, 1982). Raphael did not feel that the QAR was a new concept, but that it was an instructional strategy that incorporated skills teachers were already familiar with but provided them with a common language to use with their students. In terms of implementation, Raphael suggested that the strategy could be implemented at the younger grades but that teachers introduce it using only two categories and provide the
scaffolding for students to build the framework for the QAR upon before breaking the categories down further in later grades (Raphael, 1982; Raphael & Au, 2005; Raphael & Pearson, 1985). This timeline for strategy introduction was developed from studies Raphael completed with students in grades two through six. The effectiveness of the strategy, along with the amount of time that teachers required for implementing the QAR, was directly proportional to the age of the students. The younger the students, the longer they took to become more independent in their use of the strategy; however, when students mastered the strategy their responses were of a better quality. The QAR strategy appeared to create a heightened awareness of the questions being asked as well as providing the students with a better understanding of where they should look to find the answers (Raphael, 1985).

In 1986, Raphael expanded the initial three categories to include a fourth category that asked the reader to answer the questions based solely on their own experiences and knowledge (McIntosh & Draper, 1995; Raphael, 1982, 1986; Raphael & Pearson, 1985). Where the first three categories focused on the students being able to navigate the texts to answer questions and a student’s ability to understand how the answer to the question directly relates to what kind of question being answered, the fourth question type asks students to apply their experiences and the text to derive an answer. The “author and you” questions are meant to engage students in transfer and high order thinking to apply what they know to new situations.

Using the QAR in comprehension instruction. The QAR is a framework for both teachers and students when reading for comprehension. Teachers can use it to help guide the development of questions leading students through activating prior knowledge with “on my own” questions and gathering information in the text with “right there” questions to engaging them in deeper thinking with the “think and search” and “author and you” questions (Raphael,
When using the QAR in content areas such as science, teachers are able to guide students into becoming more strategic readers. Students develop a confidence when reading expository texts and do not become frustrated when the answer is not located in one sentence and they have to search deeper in the text. The QAR is an adaptable tool that provides teachers the ability to differentiate instruction by providing students with questions appropriate to the instructional levels that engage them in active learning without expecting students to complete more work, but instead requires them to express their understanding in a more complex manner (Kinniburgh & Shaw, 2009).

For students, the QAR becomes a tool that they can use for accessing multiple comprehension strategies. It teaches them how to read the questions and determine what the question is asking them (Raphael & Pearson, 1985). Students no longer use one type of comprehension strategy to answer the questions, they are pulling from both the readings and their prior knowledge to make predictions and synthesize answers. The QAR strategy demonstrates to students how to use text structures to determine if a question is looking for the student to make an inference based on key words in the question or if it is asking them to compare and contrast by using a different structure for asking the question (Kinniburgh & Shaw, 2009; Raphael, 1986).

**QAR in content area instruction.** The application of the QAR method in the content area allows for teachers to engage students in text analysis and evaluate their comprehension of the text (Raphael, 1982). Kinniburgh and Baxter (2012) completed a study using the QAR strategy with struggling readers and readers with disabilities during a four-week period. The study demonstrated that students made gains in comprehension of content area texts and the teacher developed a greater ability to assist these types of students. This study outlined two key
components for the success of the QAR strategy: proper training and support for teachers and explicit instruction for students when implementing the method.

The QAR strategy is a method that provides students with skills that, with use over time, become instinctual and allow for students to make connections between their prior experiences and what they are reading. This connection can lead to a deeper comprehension of the subject matter. In a study by Cummins, Streiff, & Ceprano (2012), fourth grade students who were instructed in the QAR strategy made significant gains when they were able to connect with the methodology used in the QAR. The ability to understand the need to access prior knowledge with what is currently being taught is key to being able to anchor the new knowledge into the student’s skill set. When teachers are aware of the process used to anchor new knowledge they can then guide students in acquiring those skills. In order for the QAR to be successful, both the students and the teachers need to be trained in how to access the prior knowledge and create the connections to the new knowledge. The studies that were the most successful had extensive professional development for the teachers and required teachers to be reflective in the teaching process (Kinniburgh & Baxter, 2012; Kinniburgh & Prew, 2010).

The QAR can be used as a bridge between language arts and reading instruction as well as to teach students to comprehend texts in the content area. The application of literacy skills in the content area is becoming increasingly important, as students are required to apply and synthesize knowledge from informational readings on standardized tests and in standards based educational models. Test questions from the National Assessment of Educational Progress (NAEP) no longer are based on a simplistic task, like word identification, but requires students to search through readings, activate their own prior knowledge, and provide in-depth analysis to fully answer questions.
McIntosh and Draper (1995) examined the QAR strategy when implemented in middle school mathematics. The teachers followed a five-step process for implementation of the four QAR categories. The entire implementation occurred over four 90-minute class periods and did not impact the content being taught because teachers used the math concepts as their vehicle for instruction. This example of embedded instruction of literacy skills demonstrates the fluidity of this type of curriculum development and allows for students to use those higher order transfer skills to gain deeper understanding of the subject. With the increased demands for student achievement set forth by the common core standards, teachers are going to have to shift their instruction beyond their content area (Robb, 2014).

Vocabulary Instruction

Proper reading instruction goes beyond teaching a student how to read words but by also addressing word meanings. The vocabulary a student utilizes in kindergarten is used as a predictor to gauge how well a student will comprehend what they read in the third and fourth grades. Over the years, there has been much debate regarding which words to teach and how to teach them. Researchers, Biemiller (2000) and Beck, McKeown, & Kucan (2013), have examined vocabulary instruction, focusing primarily on the meaning of words versus the phonics of the word. There has been a marked shift in vocabulary instruction, along with an emphasis upon choosing words that are considered tier two-words or academic vocabulary.

Beck et al. (2013) focused their work around developing a three-tier system for categorizing vocabulary words. Tier one includes everyday words that students learn through conversation or daily usage, tier two words are words that students must be taught yet occur in multiple academic settings, and tier three words are found solely in particular disciplines. Focusing on teaching tier two words that appear across multiple disciplines as well as in books
and articles builds a student’s vocabulary and increases the student’s reading comprehension (Beck et al., 2013).

Many studies have been completed to examine the effects of direct vocabulary instruction and also the use of individualized interventions. The results of these studies show that when students are provided with vocabulary instruction, whether it is direct instruction (Apthrop et al., 2011) or as a set of interventions (Marulis & Neuman, 2010), the students’ oral language skills increased.

Robb (2014) suggested that fifteen minutes of direct vocabulary instruction a day in every subject area can increase a student’s ability to comprehend complex texts significantly. When taught with disciplinary literacy skills, teachers make a direct connection between the vocabulary in the texts and application of the skills. When students are able to apply the skills to multiple types of texts, their ability to decipher complex texts increases and the teachers are able to gain insights into where their students’ strengths are in vocabulary and comprehension.

**Vocabulary instruction and impacts on comprehension.** In the text *Bringing Words to Life*, authors Beck et al. (2013) provided this view of the connection between vocabulary and comprehension: “There is much evidence-strong correlations, several causal studies, as well as rich theoretical orientations-that shows vocabulary is tightly related to reading comprehension across the age span in primary grades” (p. 1). Whether the student is assessed in basic reading ability, such as word knowledge and fluency, or in their ability to understand an assessment on a standard achievement test without basic word knowledge, students will not succeed on the assessment (Perfetti & Adolf, 2012).

In order for students to be successful readers they must understand what they are reading, and in order to do that they must have a working bank of vocabulary to draw from to help them
go beyond the surface of the text. This working knowledge of words must be both general and content specific vocabulary that provides the student with the opportunity to garner the meaning of the complex text. In research completed by Becker (1977), it was found that the primary reason for students failing in school was a void in the students’ vocabulary. In contrast, Stahl and Fairbanks (1986) concluded that students with a rich vocabulary are more successful in schools, which leads to the assumption that the key difference between proficient readers and poor reader is the breadth of vocabulary. Without the vocabulary knowledge students are not successful readers and this directly impacts their ability to read both narrative and expository texts as they progress through the grade levels (Yildirim, Yildiz, & Ates, 2011). The ability to delve into these texts provides students greater insights into the main ideas and themes that flow throughout the reading (Robb, 2014).

Wise, Sevcik, Morris, Lovett, & Wolf (2007) showed in their study that examined the impacts of receptive and expressive vocabulary on reading comprehension that receptive vocabulary directly impacts the students’ pre-reading readiness while the expressive vocabulary knowledge predicts the students’ ability to predict or decode for the correct words when reading. A student’s depth of vocabulary directly affects their ability to identify and retrieve words with the correct meaning when they read a new text. The impact is less when reading narrative texts; however, content specific or expository texts have a greater number of complex words that students must decode and understand in order to be able to comprehend the main idea of the reading (Dymock & Nicholson, 2010).

**Impacts of Poverty on Learning**

Poverty is cited for having negative impacts on several factors relating to students’ success in schools. Students that are exposed to persistent poverty during their developmental
years through the primary grades have lower academic achievement and lesser cognitive abilities than those students who are only occasionally impacted by poverty or are never impacted by poverty (Bhattacharya, 2010). One of the factors that poverty is directly linked to is students’ oral language skills and vocabulary knowledge prior to beginning school. Students that come from homes with a low socio-economic status (SES) have significantly lower oral language skills than those students that come from a higher SES. Lower oral language skills translate into lower vocabularies, which directly impacts their early reading skills (Wise et al., 2007).

One of the reasons for this gap is that lower SES homes have a higher level of chaos and disorganization that lead to younger children being in situations where they are overstimulated, which causes the child to withdraw into a quieter environment or they may not be able to process the language when spoken to because of the chaos around them (Evans, 2006). This disorganization and chaos comes from the lack of parental involvement due to parents either being disengaged because of work or their own lack of education. Children raised in these homes often lack high quality literacy experiences that provide them with practice in using language beyond communicating everyday needs (Bhattacharya, 2010).

Students from low SES homes are also exposed to less oral language because they are not exposed to rich conversations, are limited in their exposure to new vocabulary, and have limited access to new books. These same students learn new vocabulary at a slower rate because they were not exposed to the complex sentences that students from higher SES homes were at a young age. The lack of early vocabulary exposure also impacts the students’ ability to compose written responses to questions (Sinatra, 2008). It is not enough for parents to merely converse with students but also to engage them in discussions about books or experiences that they encountered. These discussions provide students with a chance to use vocabulary from their
reading but to then describe things chronologically or use to compare and contrast different events. Students raised in low SES homes are not exposed to these types of discussions and therefore must be exposed to more expansive vocabulary instruction. The lack of exposure generates an achievement gap between the low SES students and their peers that are exposed to these types of discussions and have developed these language skills. The students of low-income homes very rarely overcome this achievement gap even if the students’ family income increases as they progress through school (Price, 2010).

This gap can be accentuated through the teachers’ expectations for students entering their classrooms. A disparity between the students’ language achievement levels and standards at which the teachers expect them to be at can create an environment where students feel less worthy than their peers. Students then develop an identity of a poor reader and writer, which places them in a lower social position in the classroom. While this can be corrected through skill and ability instruction, there needs to be parental involvement and a high level of student engagement in both language and literacy activities (Bhattacharya, 2010).

**Impacts of poverty on students reading.** Students raised in poverty have demonstrated difficulties in developing initial reading skills including phonemic awareness and concepts of print. When comparing students who are raised in low SES homes or those in poverty versus students who are not raised in poverty demonstrates those raised in poverty lag behind their peers by an average of five years by the time they are 17 (Stinnett, 2014). Research by Herbers et al. (2012) demonstrated that students from low SES homes achieve at the same rate as their peers from middle to high SES homes thus the initial gap is maintained throughout school and without intervention can increase over time.
The issue for students raised in poverty is their lack of exposure to phonemic awareness skills, books, and a wider vocabulary. This lack of exposure means they have fewer reading readiness skills and their struggles trying to obtain these skills to meet grade level will impact their enjoyment of reading (Arnold & Doctoroff, 2003). In order for these children to be successful, teachers must be aware of where their students are in terms of exposure to vocabulary, travel, and cultural events. By providing the students with instruction of the missing skills and teaching them tier two words, students raised in poverty can overcome the knowledge gap that separates them from students who are raised in higher SES homes (Luther, 2012).

Students who come from impoverished homes have a different learning schema than those students that are raised in non-impoverished homes. They must first be taught how to organize the information they are learning and the skills to be able to communicate what they have learned. These students also need explicit instruction of both comprehension skills and vocabulary skills to be successful (Price, 2010). This instruction will allow them to create their reading identity.

Students must think of themselves as readers and be engaged in reading activities both at home and in the classroom. Teachers can foster this thought process by providing students with the opportunity to make connections to the texts they read. The text-to-self connections can lead to deep discussions that allow for reflection on their own reading identities, create meaningful connections to their readings, and provide them with a chance take satisfaction in their own abilities and their families (Battacharya, 2010).

Parental involvement in reading instruction comes from modeling literate behaviors and providing them the opportunity to have rich literacy experiences. Students from impoverished homes often enter schools at both a social and an academic disadvantage because parents do not
have the time to meet the daily demands of the household and provide students with opportunities to engage high quality literacy experiences. Students from low-income households experience print for entertainment purposes and day-to-day activities more than academic print. These daily use literacy activities do not provide students with an understanding of the functions of print or an understanding for the way that forms an arrangement of letters that allows the reader to process new information. These printed materials are also at a lower complexity level containing primarily single words or short sentences (Battacharya, 2010).

**Teacher Reflection on Instructional Practice**

The definition of reflection or reflective practice is very vague; however, the most accepted definition has been posited by Dewey (1933) to an “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (p. 9). Reflection is not simply looking back on an incident but a multi-phased systematic process. Dewey frequently wrote about six stages of reflection that were rooted in the scientific method. These six stages were annotated by Rodgers (2002): (1) reflection occurs when a practitioner solves a problem or issue by engaging in an experience, (2) then doing a quick assessment of the experience, (3) identifying problems or questions after the assessment of the experience is completed, (4) formulate explanations for the problems or questions, (5) creating hypotheses from these explanations, and (6) then testing the hypotheses (p. 851). While there are other types of reflection it is systematic reflection that makes the greatest impact on teacher practice (Hayden et al., 2013).

**Systematic reflection.** Systematic reflection as defined by Ellis et al. (2014) as “a learning procedure during which learners comprehensively analyze their behavior and evaluate the contribution of its components to performance outcomes” (p. #). In the ALACT model
teachers Act, Look back, become Aware, Create adaptations, and engage in Trial and review (Korthagen & Kessels, 1999). Methods such as the ALACT model provide teachers with a clear set of guidelines for developing their reflective practice. Systematic reflection can take many forms ranging from reflecting through journaling, reviewing video of an experience, discussion groups with peers, or using specific questions to drive the reflection. It is the ability to systematically reflect that makes teachers exemplary according to the National Board for Professional Teaching Standards (Broyles et al., 2011).

Using specific questions to drive the reflection requires the participants to move from surface level questions to higher order questions regarding their practice. When teachers engage in this process they can truly examine how their instruction impacts their students’ learning. As teachers use higher order questions to examine their practice they also tend to use them in the classroom to increase their students’ engagement and learning (Broyles et al., 2011). This insight occurs as teachers become more aware of how their teaching is viewed by their students.

**Impacts of reflection on classroom practice.** According to Hayden et al. (2013), “Reflection becomes more productive when it is comparative, viewing a critical incident from different perspectives; or critical, taking questioning perspectives that lead to new ideas” (p. 147) and it is this type of reflection that drives teachers to change their instructional practice in meaningful and lasting ways. It can also increase teachers’ efficacy and in turn commitment to the profession because they can see the impact they are having on their students’ motivation and learning (Broyles et al., 2011; Hayden et al., 2013).

Reflection during the first years of teaching is often focused on the quality of the lessons being taught and the teachers’ perception of the success of the lesson. Teachers rarely consider student feedback on the lesson but more on how students performed on assessments. The focus
of this type of reflection is primarily on his or her self-image and classroom management (Hayden et al., 2013). This type of reflection is important and helps teachers develop higher quality lessons but does not increase teacher satisfaction or efficacy. In a study of first-year Catholic school teachers, it was found that as teachers reflected on the instructional decisions they made they were able to better meet the needs of their students at all levels and provide better differentiation for students. This allowed for better communication within the classroom and lowered the frustration of both the students and the teacher (Ramos, 2012b).

As teachers progress from being a novice to experienced teacher their reflection also progresses from being centered on their own view of their teaching to how students, peers and administrators view them as teachers. This progression is often catalyzed by a critical event or incident that shifts the teacher’s mindset. It is this switch in mindset that helps teachers break through the plateau they experience in their third or fourth year of teaching (Henry et al., 2011).

Systematic reflection on problems or issues cause teachers to change their instructional methods while reflecting on their successes cause them to become more motivated and committed to their teaching practice. It is important for teachers to acknowledge both successful and problematic instructional methods to make the most impact in the classroom (Ellis et al., 2014).

**Summary**

Schools constantly look for ways to improve student achievement, and multiple studies have shown that by raising vocabulary skills, comprehension skills will also increase (Bowers & Kirby, 2010; Cox et al., 2011; Justice & Kaderavek, 2004; Marulis & Neuman, 2010). The literature reviewed demonstrated that by supporting the content areas with direct literacy instruction that student achievement increased in both literacy and the content area. By
combining the vocabulary instruction with enhanced literacy instruction in the content area a student’s overall achievement should also increase. This increase would be further enhanced by the teacher developing a clearer understanding of their own thinking about instruction and using those skills in teaching of tier two vocabulary words and using the QAR method to increase comprehension. As teachers use systematic reflection to develop their metacognition of their teaching practices, they increase their own efficacy and motivation as teachers.

The literature reviewed also highlighted that poverty has a significant impact on students’ language acquisition and students that are raised in poverty have a reduced vocabulary at the school-age compared to those students who are not raised in poverty. This is impactful in two regards because it determines the instructional level in the classroom for those students, but it also impacts the teachers’ communication with parents. It is important that teachers are aware of their student population to be able to provide instruction that is academically and developmentally appropriate for all students while also factoring in the parents’ ability to assist their students at home or their lack of ability to help their students (Luther, 2012; Price, 2010).

The strengths of the studies are the varied samples that demonstrate that this is a problem faced in all types of schools and that even schools with many resources are still facing issues in student comprehension. Another strength of the studies is that significant gains are demonstrated by using the embedded literacy method in the content area and the direct vocabulary instruction methods. When examining the work done with the QAR method the biggest strength is increasing the reading comprehension in the content area when properly supported during implementation.

The weaknesses within the studies are with the lack of specific identification of the skills that increase student understanding. In the embedded literacy studies teachers used a variety of
literacy skills to increase student comprehension but were not able to identify which skills did the most to increase student understanding of the concepts being taught. The same type of weakness was demonstrated in the vocabulary instruction studies.

The biggest gap was in being able to compare academic gains made by students in upper elementary when they had received intensive vocabulary instruction of second tier words in early elementary grades. Other significant gaps include looking at how direct vocabulary instruction in content areas could provide overall academic gains for students. The lack of understanding in which skills make the most impact in student achievement is another major gap in understanding and the lack of studies that demonstrate how the teachers’ understanding of the concepts of disciplinary literacy impacts their instruction. This study examined how a teacher’s instruction is impacted as they develop a better understanding of disciplinary literacy.
CHAPTER THREE: METHODOLOGY

Overview

The purpose of this phenomenological study was to understand how an elementary teacher’s thinking about instruction changed as they developed a deeper understanding of disciplinary literacy. This deeper understanding of disciplinary literacy was developed through the direct instruction of vocabulary and instructing students in the use of the QAR strategy for reading comprehension during science instruction.

This was achieved through the examination of how the teachers that participated in this study viewed their instruction and if that view changed as they implemented an instructional strategy that focused on the use of disciplinary literacy skills during science class. Data collection through interviews, observations, and teacher journaling provided a rich picture of the teachers’ mindsets from the beginning of the science unit where the strategy was first implemented through the end of the unit when the strategy was fully implemented in the classroom.

Design

For this study, a phenomenological approach was utilized to garner an understanding of how an elementary teacher’s understanding of disciplinary literacy impacts their instruction. The definition of phenomenology is to examine experiences of life and determine what structures existed to provide the individual with the specific experience being examined. Phenomenological approach was first used by Edmond Husserl, who advocated for examining a situation as it is in the world to determine what precipitated the occurrence of the phenomenon (Dowling, 2007). Husserl developed the study of phenomenology because psychologists who observed the reaction to the stimuli instead of examining the subject’s perception of the stimuli
that caused the reaction frustrated him. Husserl is credited with developing phenomenological reduction as a means of deriving meaning from shared experiences. Reduction is also referred to as bracketing and is a means of removing one’s individual biases as well as the biases of the outside world to see the phenomenon clearly (Laverty, 2003).

Husserl’s student, Martin Heidigger, claimed a person could not remove their own background or experiences from their interpretation of the events being studied and revised the method of reduction further. He postulated that researchers needed to be aware of their own historical influences of the subjects being researched and account for them in their interpretations (Dowling, 2007; Laverty, 2003). It was from the influence of Heidigger that Hans-Georg Gadamer posed that the understanding of the phenomenon is only complete if the researcher is an active participant in the world they are researching further explored this hermeneutic philosophy. The overall experience must be examined from both the social and cultural aspects to determine the correct interpretation (Dowling, 2007; Laverty, 2003).

From the philosophical ideologies of Husserl and Heidigger (Dowling, 2007; Laverty, 2003), Alfred Schutz (1967) identified the connection between action and the meaning behind the action as the basis for understanding the common phenomenon different individuals experience. Each individual has their own experience with the phenomenon being studied and it is by examining their perceptions of that experience in retrospect meaning can be attributed to the actions that occurred. Schutz (1967) believed that in order to fully perceive an individual’s motivation that one must be able to understand both the objective and subjective intent of the action. The motivation behind the actions can be to understand the situation or to understand how the person is affected by the action. This leads to Moustakas’ (1994) definition of
phenomenology that states description that is rich and thick from continuous reflection of what the participant is experiencing is the essence of phenomenological studies.

The phenomenological study method was appropriate because I examined the teachers’ experiences as they implemented a specific set of instructional methods during science instruction and the effect it had on their instructional methods. This phenomenological study sought to understand how the use of the embedded literacy skills and direct vocabulary instruction technique (associated with disciplinary literacy) changed a teacher’s perception of literacy instruction. The parameters for this study included 12 teachers who taught students science in kindergarten through fifth grade and the three literacy specialists who supported those teachers. This allowed me to gain a wide perspective of how teachers’ pedagogical understandings changed when they all implemented the same science curriculum and literacy skills at different grade levels.

**Research Questions**

This phenomenological study was guided by the following five research questions that are focused around understanding how a teacher’s metacognition of disciplinary literacy changed from before implementation of the instructional strategies to after implementation. The first question provided insight into the teachers’ thinking about disciplinary literacy while questions two and three focused specifically on of the use of the strategies in science instruction and teachers’ feelings about the specific strategies being used in the study. The fourth and fifth questions related to the implementation of the strategies into the classroom.

**RQ1:** How does implementing disciplinary strategies change teacher metacognition of disciplinary literacy?
**RQ2:** How would teachers describe the experience of implementing the QAR and embedded vocabulary literacy strategies into science instruction?

**RQ3:** What do teachers perceive to be the benefits and drawbacks of the QAR and embedded vocabulary literacy strategies?

**RQ4:** What additional resources would have made an impact in implementing disciplinary literacy?

**RQ5:** What obstacles exist in implementing the disciplinary literacy?

**Setting**

The location for this study was a rural elementary school in central Maine. The school had approximately 265 students in preschool through fifth grade. The Maine Education Data Management System (MEDMS) identified that the student population was 93% Caucasian with the remaining 7% being African American, Pacific Islander and Native American. Maine’s direct certification of eligibility lists identifies the majority of the student population as coming from economically disadvantaged families (https://maine.infinitecampus.org/campus/mese.jsp). The number of students at the poverty level qualified every student for a federal program that provides the entire school with a free breakfast and lunch. This school was chosen because it was representative of the rural schools in Maine.

**Participants**

The participants were 12 teachers who taught science to students in kindergarten through fifth grade with over five years of classroom experience and the three literacy specialists who supported the teachers during the implementation. The sampling methods for this study were both criterion and convenience based sampling. According to Creswell (2013), criterion sampling is used to recruit participants that match a specific set of criteria needed to match
research objectives and convenience sampling is used to recruit participants that are easily accessible and in close proximity. The teachers selected for this study were the only teachers at the grade levels being studied who implemented the instructional strategies being examined. The teachers were easily accessible because I worked with the teachers. None of the participating teachers had an advanced degree or certificate; all of the teachers lived locally and many of them grew up in the region. The study focused on general education classrooms and, therefore, special education teachers working with students in this grade span were not selected to participate.

**Procedures**

For this study I obtained Institutional Review Board (IRB) approval (see Appendix A) and received permission from the superintendent to conduct the study at Cole Elementary (school name has been changed to protect study participants). The name of the school has been changed to protect the confidentiality of the participants.

Two teachers who had taught in elementary education for over five years participated in the pilot study. One teacher had been in education for 15 years and currently taught in the gifted and talented program at an elementary school in Missouri. The other pilot teacher had been in education for 35 years and taught in an elementary school in Maine. The interviews were conducted using Skype and were recorded using a Sony microcassette dictator/transcriber M-2020 and notes were taken to document immediate impressions about the usefulness of the questions being asked. After the initial interviews were completed, the questions were reviewed to determine if the question was applicable to the study. Based on the length of the interviews questions were adjusted to shorten the interview length and questions were narrowed to focus on instructional strategies and knowledge of literacy and science content knowledge.
Appendix B contains the consent form approved by the IRB that I passed out to the teachers who agreed to participate. I recruited the study participants during an unscripted staff meeting. During the meeting I explained the purpose of the research and the expectations for the teachers who participated in the study. The teachers who consented to be a part of the study all signed the Informed consent form. I conducted the initial interviews with the teachers in the spring prior to implementation. Prior to the beginning of the school year, I conducted a professional development workshop on pre-teaching vocabulary for all the teachers in the school. I then conducted a professional development workshop on using the QAR during content area lessons at the beginning of the school year for all the teachers in the school. During the six-week implementation period, I observed the teachers’ classrooms twice a week, once during the ELA block and once during the science class. At the time of the observation I collected site documents or artifacts that supplemented the teachers’ instruction of vocabulary or the QAR strategy. Once a week, during the six-week implementation period, teachers responded to a journal prompt that was provided for them. After the six-week implementation, a post-interview was conducted with each of the 12 teachers and the three literacy specialists.

**Role of the Researcher**

I served as the principal of an elementary school in north central Maine—the school in which the study was situated. As the principal of the school the past four years, I worked with the curriculum coordinator to implement new strategies for vocabulary instruction. Previously, I served as a principal for two years in a secondary school in northern Maine and for eight years as a secondary science teacher in two other districts in central Maine. I hold a Certificate of Advanced Study in Educational Leadership, a Master of Science in Science Education, and a Bachelor of Science in Biology.
This study combined the school’s recent work with the literacy curriculum and my science background. I had personally known and worked with the teachers in this study for four years. My passion for science and the literacy work that the teachers had completed produced a bias in terms of believing in the importance of integrating literacy into the science curriculum. To reduce the impact of researcher bias, the researcher must be neutral as possible in their interactions with the participants (Mehra, 2002). To accomplish neutrality and avoid further bias in the study, the focus was placed on how the teachers thought about their teaching and not on their ability to implement the strategy or the specific science content. Confirmatory bias, the process by which data that does not support the researcher’s hypothesis or opinion is minimized (Malone, Nicholl, & Tracey, 2014), was reduced by collecting all literature for the literature review and inclusion of all data collected in the data analysis. As the principal, I was responsible for completing evaluations on my staff; however, the implementation of this teaching strategy occurred after the evaluations were completed during the fall of the year. The evaluations were completed during the first six-weeks of the school year and data collection did not begin until eight weeks into the school year. Teachers understood that their evaluation was not connected to this research because the written evaluation was returned to them before research observations began to occur. There was familiarity during the observations between the teachers, the students in the room, and myself. This familiarity helped to put the teachers at ease when I was conducting interviews and the students were not distracted by my presence in the classroom.

**Data Collection**

For this study, the teacher interviews, classroom observations, journals, and classroom artifacts were collected and analyzed to determine how the teacher viewed their instruction before, during, and after the implementation of the teaching strategies. The teachers were
interviewed first to establish their educational backgrounds in science, literacy, and vocabulary instruction. Classroom observations and a post-implementation interview were completed to ensure that teachers had implemented the instructional strategies with fidelity. The journals and classroom artifacts were collected after the observations were completed to substantiate what was seen during observations and as a way to gain further insight to what the teachers experienced during the time of the study.

**Interviews**

The 12 teachers were interviewed, focusing on their literacy and science education as well as their instructional experiences. The three literacy specialists to include, the school literacy coach, the reading recovery teacher, and the school literacy and math interventionist, were interviewed, focusing on how they assisted the teachers with proper implementation of the two literacy strategies. The interview method employed during this study was a semi-structured approach. The semi-structured approach utilizes pre-determined questions but allows for the interviewer to follow-up on answers given by the interviewee with questions that were not previously established (Barriball & While, 1994). Two semi-structured interviews were conducted with each teacher in 30-minute sessions during their planning period or after school depending on the teacher’s availability. The interview sessions were held in the teachers’ classrooms and were recorded using Sony microcassette dictator/transcriber M-2020 with a second recording being done by a hand held digital recorder. During the interviews I took notes of any follow-up questions that arose and documented areas of the interview where the teachers exhibited significant emotional responses.

The interview questions were based on two case studies that implemented disciplinary literacy through an historical conceptual model designed by Mandell (2008) and Franco, (2010).
Franco, (2010) developed open-ended questions that were subjected to an expert review interview questions. I chose to model my questions from these two sources because of the emphasis of implementing disciplinary literacy into content area instruction. I reviewed each question presented in the case studies with a certified literacy interventionist and a certified science teacher. The questions that were developed are as follows:

Semi-Structured Pre-Implementation Interview Questions:

*General Educational Experiences as a student of science and literacy:*

1. Describe your formal education within the discipline of science.
2. Describe your formal education within the discipline of literacy.
3. Define “scientific literacy.” Do you promote scientific thinking in your curriculum?

*Experiences in Science Teaching:*

1. Describe your experiences in teaching science prior to the new science program.
2. Describe your experiences in teaching science with the new science program.
3. What methods did you use to teach vocabulary before the new science program?
4. What were your experiences with science terminology?
5. What methods did you use to teach vocabulary with the new science program?
6. What experiences have added to your development of “scientific literacy?”

*Knowledge, Skills, and Dispositions of Teaching Literacy:*

1. What are the most common teaching strategies you use? Why do you use them?
2. Define “inquiry.” How do you integrate inquiry into your practice?

*Final Thoughts*

1. Is there anything else you would like to mention about your experiences with
teaching science and literacy?

Post-Study Semi-Structured Interview Questions:

1. Has embedded literacy instruction (ELI) transformed the way you teach science? If so, how? If not, please describe why ELI has not been transformative to your practice.

2. How much ELI integration was necessary for you to integrate into your practice in order to help build students' literacy skills?

3. What level of literacy premeditation was necessary for planning effective science lessons in order to further develop students’ disciplinary literacy?

4. What lessons or strategies did you use that seemed to be the most successful for developing students’ disciplinary literacy with ELI?

5. How did school-level factors influence your curricular emphasis in the classroom?

6. How did personal interest influence your curricular emphasis in the classroom?

7. What resources could have made the implementation of the ELI more successful?

8. Were there any obstacles in implementing the ELI?

9. Were there any drawbacks to using the ELI?

10. Any final thoughts you would like to add?

Interview Questions for the Literacy Specialists:

1. Has embedded literacy instruction (ELI) transformed the way you support the teachers in the classroom? If so, how? If not, please describe why ELI has not been transformative to your practice.

2. What level of literacy premeditation was necessary for assisting the planning effective science lessons in order to further develop students’ disciplinary
literacy?

3. What lessons or strategies did you provide for teachers to use that seemed to be the most successful for developing students’ disciplinary literacy with ELI?

4. How did school-level factors influence your ability to help the teachers implement these curricular emphases in the classroom?

5. How did personal interest influence your assisting the teachers?

6. What other factors influenced your ability to help teachers with the implementation of ELI?

Final Thoughts

1. Is there anything else you would like to mention about your experiences with teaching science and literacy?

The overall purpose of the educational background pre-implementation interviews was to provide myself with a baseline for each participant. Specifically, questions one through three were to establish each participant’s educational background and their understanding of scientific literacy. The second section of the pre-implementation interview were asked to ascertain the participant’s history with teaching science and their classroom practices. Questions three and four specifically addressed the concern raised by Beck (2013) and Robb (2014) about the instruction of tier two and tier three vocabulary words that occur across multiple content areas. The teachers’ familiarity with science vocabulary and the words with multiple meanings that occur in multiple content areas were important in establishing how his or her view changed implementation. Questions one and two in the literacy instruction section of the pre-implementation interview were asked to determine if the teachers were currently using the literacy strategies being implemented by myself and if they had a working definition of inquiry.
The ability to use multiple instructional strategies allowed for teachers to make the content more accessible to students (Faulkner, 2012) and a working understanding of inquiry is essential in the implementation of inquiry-based literacy strategies (McClune et al., 2012). The QAR is an inquiry-based strategy and these questions allowed for me to develop an understanding of the participants’ initial understandings prior to beginning the professional development.

The questions in the semi-structured post-implementation interview focused on the participant’s view of his or her instructional practices after implementing the instructional strategies. The responses from questions one and two provided the basis for answering research question one. Research question two was addressed by questions two through six because they provided insight into how the participants felt about the process of implementing literacy strategies. Post-implementation question seven spoke to the need for further resources, which are part of research question three. Participants’ answers to questions four and nine related to research question three the benefits and drawbacks along with research question five which speaks to obstacles in implementation.

The literacy specialists participated in a semi-structured interview focusing on how they supported the teachers’ use of the literacy strategies. Those interviews were conducted in their classrooms during their planning time or after school depending on their availability and recorded using the same methods as the teacher interviews. Those interviews served to establish fidelity of implementation of the strategies by the teachers and what types of supports were required for teachers to be successful. Questions one through three spoke directly to assisting teachers in implementing the literacy strategies. The assistance to implementation provided teachers with a second source of support and helped to ensure that teachers were properly implementing the strategies. The answers provided me with an outside view of how the
participants’ teaching practice changed with the implementation of the research questions. Answers to interview questions four through six offer support to research questions four and five. Appendix C contains a blank copy of the interview questions and examples of the completed pre-interview in Appendix D and the completed post-interview in Appendix E.

**Observations**

An observation is defined as a set period of time during which a teacher implements a specific strategy and a non-participant researcher is in the classroom documenting the experience (Creswell, 2013). I observed the 12 teachers in their classrooms during their science lessons twice a week for six weeks. During these observations I used the observational protocol and a copy of a completed protocol is in Appendix F. An observational protocol is an established method by which I take notes on a specific instructional technique. These notes can also be referred to as field notes (Creswell, 2013). I tracked the use of the QAR method and the vocabulary instruction during the science lesson. I debriefed each observation with the teacher and asked any follow-up questions that were generated during the observation.

The observations acted as a means of ensuring that teachers were properly implementing the QAR and vocabulary instruction. The observations served to provide insight into how comfortable the teachers were with the instructional strategies and if their comfort levels changed as they used them more in the classroom. A secondary insight was how the teachers reacted to the students’ use of the QAR and the results of their use of the strategies on student academic achievement.

The observations and field notes generated during the observations supported the teachers’ answers to the interview questions. They also helped to answer the first research question around the teachers’ metacognition of disciplinary literacy and the observer was able to
see how the experience impacted the teacher in the classroom which helped to answer research
questions two and three.

**Journals**

Journaling is a data collection method where each participant keeps a journal where they
record their thoughts and feelings around a set subject during a set period of time determined by
the researcher (Creswell, 2013). These journals can be used to clarify opinions and feelings the
research participants have in regards to the research being completed (Janesick, 1999).

Each teacher maintained a journal during the length of the study beginning with the
professional development around the disciplinary skills to record thoughts and perceptions of
their science and literacy lessons. Teachers responded to a set of provided prompts that are listed
in Appendix G. The teachers’ journals were used to verify implementation of the literacy
techniques, gather an understanding of their perceptions of disciplinary literacy, and develop a
sense of their feelings of how the technique is impacting their instruction. The journals were
collected weekly for coding and analysis, then the findings were incorporated with the other data
to help answer research questions two, four and five.

**Documents and Artifacts**

Qualitative research documents and artifacts are analyzed for what may or may not be
included in the document and how the research participant is using it (Creswell, 2013).
Classroom documents and artifacts are items that teachers used in planning for their daily
lessons, handouts they provide students, or pictures of anchor charts the teacher used in
introducing new concepts to the class (Silverman, 2001). Lesson plans that demonstrated the
teachers’ implementation of various strategies were collected and analyzed in collaboration with
the observations and journal entries. I collected any classroom handouts and examples of student
work that could demonstrate student understanding of the instructional methods being implemented.

These documents and artifacts demonstrated the teachers’ understanding of the instructional strategy and their ease of implementing the strategy with the students. They demonstrated the teachers’ commitment to implementing the strategy by the amount of effort they put into planning to incorporate the strategies into the lessons so there is a seamless integration of the strategy versus it being a standalone skill. The documents and artifacts helped to answer how the teachers’ metacognition changed around disciplinary literacy, the resources needed for implementation, and their perceptions of disciplinary literacy. Examples of two classroom artifacts that teachers used during lessons are in Appendix H.

**Data Analysis**

The data was analyzed using Moustakas’ (1994) seven steps for coding data. This method includes the following steps:

1. Creating lists and developing initial grouping,
2. Reduction and elimination,
3. Clustering and identifying themes of the invariant elements,
4. Finalize the invariant elements and themes by application,
5. Construct individual textual descriptions,
6. Construct of individual structural descriptions, and
7. Construct an individual textual-structural description of the meanings and essences of the experience for each participant.

Coding data is the process by which the researcher breaks down the collected data into smaller groupings based on what phenomenon is being studied (Creswell, 2013). I then labeled
the groups based on the common characteristic in the data set. The purpose of coding is to determine if meaningful patterns can be identified from a collection of data. The different codes/groups were combined to create a broader collection that the research identifies as a theme within the data. Themes are families of data that give context to the experiences had by the research participants. Each theme was given a textual description that explains what occurred during that particular phenomenon as well as a structural description that will provide a description of the setting, conditions, and context of the phenomenon. The textual and structural descriptions were combined to provide a complete picture of what each research participant experienced during the phenomenon being researched (Moustakas, 1994).

The interviews, observations, site documents, and teacher journals, were analyzed and coded based on the teachers’ common experiences. The codes identified were grouped into themes to determine if and how the teachers’ perceptions changed throughout the course of the study. This is important because this analysis of themes allowed me to pinpoint when, if any, change of perception occurred and if any adaption of instruction occurred. The observations provided the structural description of the themes and combined with the textual descriptions of the themes identified in the journals and interviews. An enumeration table of the codes and groupings are in Appendix I.

**Trustworthiness**

Trustworthiness or validation of the research is developed through four different aspects: transferability, confirmability, credibility, and dependability (Lincoln & Guba, 1985). Each aspect was supported through different methods such as data triangulation, peer review and member checks, thick rich detail descriptions were provided from the observations, and many
quotes from the interviews and journals were used to develop a clear picture of the participants’ feelings about the use of disciplinary literacy skills.

**Credibility**

To ensure credibility, study data was collected four ways: interviews, observations, site documents, and teacher journals. This method of establishing credibility is called triangulation. Data triangulation is the process of using multiple data sources to provide evidence of consistency, thus increasing the validity and reliability of the study (Creswell, 2013, p. 251). The peer review process, or external audit/check, is a method of validating that the themes or findings match what the researcher identified from the analyzed data (p. 251). This process allowed for another researcher to examine my interpretations and determine if there were any themes that were overlooked during analysis to ensure credibility. The peer review provided for greater accuracy and oversight for the study.

Along with the external checks, there were internal reviews completed by the participating teachers in a process called member checks (Creswell, 2013, p. 251). The participants were allowed to review the interview transcripts and the notes from observations to validate the content as well as the interpretation of the analyzed content. The member check and the peer review ensured that the participants were accurately portrayed and that the researcher had not colored the transcripts with her opinions or views which provided confirmability to the research and methods of obtaining the data.

**Confirmability**

Confirmability is the extent to which the researcher’s biases shape the study and their ability to be objective at the outset of the study (Shenton, 2004). At the beginning of the study, I stated my position and any possible bias the study may contain. As an educator who taught the
content area of science for eight years before transitioning to administration, the reader will know that I am an advocate of students developing literacy skills that can be applied across the curriculum. As such, I may inadvertently miss any negative aspects of teachers adapting instruction. This awareness of my own personal biases is vital for other researchers in case my beliefs alter the results of the findings of the qualitative study.

**Transferability**

Transferability is the degree to which the results of the study can be applied to other situations. Through providing rich, thick descriptions of the data the researcher allows for readers to apply the findings to new contexts and situations (Shenton, 2004). Since the generalization of qualitative studies is very limited it is important that the researcher provide as many details as possible so that readers can compare the phenomenon that was studied to their own situation.

**Dependability**

Dependability is the accounting of the methods used, the changes made to the study in order to gain the clearest understanding of the context in which the study was completed (Denzin, 1994). The use of overlapping methods, for example: interviews and journaling, provides methodological triangulation that cross-validates the data collection, thus establishes further dependability to the research methods (Shenton, 2004). The methods used to interpret the data collected were detailed so that future researchers can compare their findings to mine to verify my interpretations.

**Ethical Considerations**

Multiple ethical considerations were taken into account while conducting the research. During this study the teachers implementing the instructional strategy were part of the faculty
that worked in the building in which I was the principal. Teachers were reassured that participation in the study was voluntary and that all interviews or observations were used only for the purposes of the study. Participation in the interviews and the observations were part of their yearly evaluation. All participants signed an informed consent that allowed them to leave the study at any point if they felt uncomfortable. This agreement protected the participants’ rights. In order to protect teacher privacy, interviews were conducted in a private setting and the transcripts of the interviews were kept in a locked cabinet or in a password protected file on my computer. Teachers were informed of where all transcripts were held and who had access to them.

**Summary**

The phenomenological approach for this study was appropriate because the research examined the shared experience of teachers as they implemented the QAR method with direct vocabulary instruction. The participants in the study were 12 teachers who taught science to students in grades one through five with the majority having over five years teaching experience.

The data was collected using four different methods: interviews, observations, journaling, and site documentation. The triangulation of data collection provided for a multifaceted look at the teachers’ experiences during the implementation of the learning strategy. The data was analyzed using Moustakas’ seven steps to bracket and identify themes in the data. I ensured trustworthiness through credibility, confirmability, transferability, and dependability. My role as the principal of the school where the research was conducted was taken into ethical consideration.
CHAPTER FOUR: FINDINGS

Overview

A phenomenological study was completed to examine the effects of integrating two literacy skills into the science content area on the participating teachers’ metacognition of their teaching practice. The participants of the study were 12 elementary teachers who teach science and the three literacy specialists at Cole Elementary, the name has been changed to protect the participants, located in rural Maine. The study focused on the integration of disciplinary literacy in to the newly adopted Pearson Interactive Science program using the QAR (Raphael 1982), and direct instruction of vocabulary. Teachers were provided professional development and then implemented the strategies into their science instruction. The teachers were interviewed prior to beginning the implementation and re-interviewed after the six-week implementation period. During the six-week implementation teachers were observed twice a week for twenty minutes, once a week during science and once a week during ELA and any relevant classroom documents were collected. The collected data was then analyzed using Moustakas’ methodology.

The purpose of this phenomenological study was to understand how an elementary teacher’s thinking about instruction changed as they develop a deeper understanding of disciplinary literacy. This deeper understanding of disciplinary literacy was developed through the direct instruction of vocabulary (Robb, 2014) and instructing students in the use of the QAR strategy for reading comprehension, as introduced by Raphael (1982), during science instruction. These strategies created a literacy framework for the science content area instruction enabling teachers to utilize disciplinary literacy (Yore et al., 2007). Using these strategies to examine the teachers’ understanding of disciplinary literacy, specifically the QAR in elementary instruction,
stems from the study completed by Wilson et al. (2009) regarding teachers’ awareness of the teaching practice when using a literacy framework.

Criterion and convenience sampling were used to recruit participants for this study. This method of sampling permitted me to sample teachers who were already committed to teaching the science curriculum and allowed me to develop a more in-depth perspective of how teachers viewed their own professional growth through their adoption of new instructional methodologies.

The following research questions were explored:

**RQ1:** How does implementing disciplinary strategies change teacher metacognition of disciplinary literacy?

**RQ2:** How would teachers describe the experience of implementing the QAR and embedded vocabulary literacy strategies into science instruction?

**RQ3:** What do teachers perceive to be the benefits and drawbacks of the QAR and embedded vocabulary literacy strategies?

**RQ4:** What additional resources would have made an impact in implementing disciplinary literacy?

**RQ5:** What obstacles exist in implementing the disciplinary literacy?

This chapter presents the key findings obtained from pre- and post-interviews, participant journals, classroom observations, and site documents. The following is a description of the overall participant group both as a whole and individually.

**Participants**

Participants were all teachers from Cole Elementary School in rural Maine. They were selected for the study through criterion sampling and received professional development specific for this study. The teachers consented to the study and provided the following information
through interviews conducted prior to and after the study. To ensure privacy pseudonyms were used for all study participants. All participant quotes were taken verbatim which include verbal ticks and grammatical errors in speech and writing to more accurately depict participants’ voices.

**Research Participants as a Group**

The study participants of this study were 12 teachers who taught all content areas including science students in kindergarten through fifth grade, and the literacy specialists to include the school literacy coach, the reading recovery teacher, and the school literacy and math interventionist. All participants in the study had been working in education for more than five years and all of them had been working in this school for at least three years. Only the school literacy coach had an advanced degree at the time of the study. Prior to this study only two of the teachers had any course work that focused specifically, science beyond their methods courses.

To provide an overview of the participants both collectively and individually, Table 1 organizes the information about the participants’ attributes. The educational attributes were gathered during the initial interviews when the participants discussed their backgrounds in education and their familiarity with disciplinary literacy, science education, inquiry, and literacy education.
Table 1

*Overview of Participants in the Study*

<table>
<thead>
<tr>
<th>Participant Pseudonym</th>
<th>Age Group</th>
<th>Education Level</th>
<th>Able to Define Disciplinary Literacy</th>
<th>Able to Define Inquiry</th>
<th>Taught pre-determined vocabulary</th>
</tr>
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<td>Gene</td>
<td>50+</td>
<td>Bachelor’s Degree</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
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**Individual Participants in the Study**

The individual participants were selected based on their employment at the elementary school where the study was taking place and several criterion factors. These factors included
teachers must all teach science using the new Pearson Interactive Science program, teachers must have been working in education for at least five years, and they must all teach a literacy block during the day. These factors ensured that all teachers were able to experience the same phenomenon of implementing embedded literacy skills into their science content area instruction.

According to Smith, Flowers, and Larkin (2009), when interpreting phenomenological data, a clear picture of the participants who experienced the phenomenon and their perspectives is necessary for accurate interpretation. The introduction of each participant uses their pseudonym and gives their attributes and their educational experiences thus far plus personal information that may impact their perspectives of this phenomenon. The participants were: Gene, Beth, Amy, Sally, Aubrey, Jan, Penny, Mallory, Megan, Jackie, Jessica, Patty, Betty, Julie, and Toby.

**Gene**

Gene had been with the school district his entire teaching career and was one of the original teaching staff when the school opened in 1993. He was on the committee that chose the new science program and had worked with the Curriculum Coordinator on developing the new assessments for science and literacy. He prided himself on his science units prior to the new program and his “adaptability” when teaching.

**Beth**

Beth held an early elementary degree and owned a daycare prior to coming to work at the school where she had been teaching for ten years. Her primary focus was on early literacy and math skills in the classroom and participated in the science units that were designed by her grade level team before the implementation of the new science program. Beth was always willing to
try new things but did not develop many of her own activities nor made any effort to pursue any education beyond her initial degree.

**Amy**

Amy originally taught middle school before being transferred down to the elementary school where she taught in the upper grades, team taught for two years while also working as a reading recovery teacher, and was then working in her own classroom while continuing to work with reading recovery students. Amy was asked to take the reading recovery training and a class offered at the school but had never sought out any further education experiences on her own. She took the classes and became a reading recovery teacher. Amy worked with struggling students on their literacy skills through reading recovery lessons and worked with small groups of students as needed. As part of the reading recovery work she had attended a yearly professional development workshop focused on literacy and attended monthly professional development meetings with her teacher leader. She had always taught the science units that were developed for the grade she was teaching and helped to develop assessments at the required curriculum meetings.

**Sally**

Sally had worked for the district in the same elementary school for 15 years. Sally was a trained reading recovery teacher who worked with two struggling literacy students a year on top of her teaching duties. She had attended all required curriculum meetings and worked on the district assessments for her students. Sally had also taken coursework to improve her literacy skills when provided by the district at the school. She had not sought out trainings beyond the ones provided by the school and the yearly professional development offered by reading recovery.
Aubrey

Aubrey had worked for the district for ten years in the lower elementary grades. She was currently working on her master’s degree in literacy and had been using a STEM program in her classroom the last three years with an integrated literacy component. Aubrey had the reading recovery training in literacy lessons and had attended the district curriculum meeting for creating assessments. She felt her strength was in differentiation of the program to allow all students access to the learning targets.

Jan

Jan had worked with students in kindergarten through eighth grade in two different districts. She originally taught middle school English for the district before being moved down to the elementary school. Jan had not taught science in several years and was very open about preferring to teach literacy. She had taken several professional courses and other trainings that she had been offered but had not pursued any advanced degrees.

Penny

Penny had worked at the elementary level her whole career, first teaching at a small school in a multi-age classroom before coming to her current school. Penny had taken several professional development courses and took the college course that was offered at the school. Penny focused on science in her classroom and had helped to develop the science units that were used prior to the new program being instituted.

Mallory

Mallory had worked for the district for 24 years and had been making efforts at the request of the administration to explore new teaching strategies. She had only participated in professional development when they were provided by the district and had not taken any higher-
level science or literacy classes beyond her methods classes. Over the last two years, Mallory had been trying to improve her literacy instruction by implementing the daily five and enlisting the help of her grade level colleagues to create curriculum that could support struggling learners and extension activities for advanced learners.

**Megan**

Megan had been with the district ten years. Megan had a Bachelor of Science in teaching with a specialty in science. She had not taken coursework beyond what had been offered by the district but had sought out professional development opportunities. She had participated in the science and curriculum committees for the district and helped to pilot several different core programs before the district selected the new program.

**Jackie**

Jackie was a newer teacher who had been with the district five years, starting with her student teaching. Jackie had started in a science field before earning her teaching degree, and her understanding of science concepts and vocabulary was extensive. Jackie had been taking all the literacy courses that the district had offered to improve her literacy background. She was required by her contract to attain her master’s degree within eight years of working under a teacher’s contract.

**Jessica**

Jessica was a teacher with over 15 years of experience in the district that specialized in math and science instruction. Jessica had actively taken classes and participated in professional development to integrate literacy into math and science lessons. She had worked extensively on creating ways to engage students in her lessons through interactive notebooks and different programs online.
Patty

Patty was a veteran teacher with 18 years of experience with the district. She was very active in the district with the recertification committee and mentoring of new teachers. Patty had been working on developing the new writing program with the school literacy coach and had been developing her vocabulary instruction using several new teaching strategies.

Betty

Betty was a teacher with over 20 years of experience and worked as the school’s literacy coach and had been with the district for three years. She was a classroom teacher for the first part of her career before becoming a reading recovery teacher and interventionist in two other districts. Betty had been focusing her literacy work on programs such as Words Their Way and Lucy Calkins Writing. She was one of a select few staff members that had gotten an advanced degree.

Julie

Julie began as a classroom teacher and then developed her career to include reading recovery instruction. Julie was currently the reading recovery teacher and interventionist for grades 1 and 3. She had taken several professional development courses and had completed several college level courses in literacy. Julie was on the committee to select the current science core program and had participated in several district level committees around curriculum.

Toby

Toby had worked for the district for over ten years in different capacities. Toby began his career in education as an educational technician in special services before working for the elementary school as an interventionist. He was currently working on his reading recovery certification and planned to become a full-time reading recovery teacher within the next year.
Toby was a team player that took direction well and worked well with teachers to identify specific areas that children needed to focus on to make gains. He focused on science during his undergraduate elementary education degree and had been a support to teachers during the implementation of the science core program.

**Results**

To provide precise answers to the research questions the data was organized to demonstrate how the teachers implemented the literacy strategies within the classroom. The classroom observations provided direct evidence of the implementation of literacy skills into the content area of science. Concrete themes were identified when a direct comparison of the classroom observations, the journal responses, and the interviews were completed.

The themes directly related to the research questions that guided the study. The process of theme identification began with compiling all of the data collected and creating a list of common phrases found in the interviews and journals and then comparing them to what was observed in the classroom. Codes were created from these recurring phrases and the codes were then grouped together or eliminated based on their ability to add to the understanding of the moment and if they could be broadened to apply to the larger experience. The enumerated table of the open codes and the themes that were identified are in Appendix J. Once this process was completed the remaining phrases could be clustered together and labeled creating the core experience that is the theme for which the textual and structural descriptions were written. This process was used based on the methodology created by Moustakas (1994).

I used the interviews and the journals to create the rich textual and structural descriptions of the individual teacher experiences. From those descriptions I then created the overall textual and structural descriptions for the whole participant group as they related to the research
questions. There were several themes that were identified through my immersion in the interviews, observations, and teacher journals. These themes included teachers having a greater awareness of their teaching styles and types of questions they asked students, reflecting on the experience helped teachers to improve their practice, integration of literacy into science required teachers to be more forward thinking about their teaching, and the changes to the curriculum were more school driven than personal for the teachers. Many of these themes were anticipated and those that were unanticipated were found useful in creating an understanding of the effect that the embedded literacy integration and direct vocabulary instruction on the participants’ views of their instruction. The data from within each theme was then examined to determine any subthemes that existed.

**Awareness of Teaching Practices**

Research question one focused on the metacognition of teachers in relation to their own instructional methodology. Specifically, the question relates to the implementation of two instructional strategies and how the teacher views the impacts to their practice. There was an overall awareness drawn to how lessons were being developed in regards to the types of learning skills that teachers were using in the classroom. A greater sense of engagement by the students as a result of using these instructional strategies led to a more faithful implementation of the strategies and for the teachers to revise previously written lessons to include the new strategies.

Teachers developed an awareness of teaching practices and how content is presented to students. This theme directly related to the first research question dealing with how teachers’ metacognition of disciplinary literacy changes when asked to implement certain literacy skills into the science content area. Over a six-week period multiple teachers reported that when
creating the lesson plans and during classroom instruction they reflected on the types of questions being asked of the students. Patty relayed:

Before the focus on vocabulary I would define the words as they appeared in context and the thread of the lesson was often lost. By pre-teaching the words students are able to focus on comprehending the concepts instead of the words being used. (Patty, personal communication, November 23, 2015)

The number of higher order skills being utilized in lessons was more prevalent in grade 3 through 5, and there was a notable increase in these skills as the teachers became more comfortable with teaching the literacy skills. Teachers in kindergarten through second grade focused primarily on knowledge gathering and application of that knowledge. Teachers in the lower grades did attempt to have the students utilize the skills especially increasing vocabulary instruction and integration during the science lessons.

During the interviews teachers reported that they had begun to do more literacy integration because of the Pearson Interactive Science program that was adopted by the school district. Jackie directly addressed this during her post interview. Jackie stated, “The text features found in the science workbooks made it easier to connect literacy skills without having to search for ways to fit them in” (Jackie, personal communication, November 9, 2015). The increased focus on disciplinary literacy made teachers more aware of those features of the program and combined with the implementation of vocabulary instruction, teachers adjusted their practice. In Penny’s classroom the change was minor because the teacher had already been utilizing the text features to integrate literacy into the instruction. The teacher focused on the vocabulary and adapting the types of questions that were being asked in the text; she began to supplement the text with higher order questions that required the students to synthesize the
information from the text into their writing or classroom discussions. During the post-implementation interview Penny discussed how the QAR impacted her instruction stating, “Using the QAR strategy allowed me to provide students with different types of questions that could be adjusted based on their academic needs. I wasn’t asking just one type of question for all students,” (Penny, personal communication, November 10, 2015).

A lower elementary teacher, Aubrey, reflected that the embedded literacy concepts made her more cognizant of her daily instruction. Aubrey began to integrate the concepts into her class read alouds, the morning message, and content area instruction. The vocabulary was reviewed in multiple formats throughout the day and provided the students with multiple levels of scaffolding to attach the new knowledge. During her post-implementation interview Aubrey shared, “The ELI strategies, specifically the vocabulary instruction, made me think about how to connect the new words with what my students already know so that they could have hooks,” (Aubrey, personal communication, November 17, 2015). This was also done in Jessica’s fifth grade classroom by having students work with the content being covered in science during their literacy block through reading articles. Jessica stated:

Students would read the articles as part of their non-fiction reading workshop and then we would re-read them for content comprehension during science. It allowed for them to focus on the comprehension questions presented by the QAR and the students even began to generate questions for each other (Jessica, personal communication, November 9, 2015).

Both teachers found that by integrating science content into the literacy block students were able to access the information twice. Students were able to focus on the content in science because they already had been exposed to the literacy skills that they were using to acquire the new
knowledge. When the teachers asked for them to use higher order skills students were able to draw on the previously learned content to utilize those skills.

There was a greater transfer of higher order skills between the content areas when the students were able to focus on the content during science feeling secure in the instructional method learned during literacy and they were able to focus on the instructional methods because they were not having to struggle to understand the concepts presented in the article. This increased engagement and success experienced by the students directly impacted the teachers’ willingness to integrate disciplinary literacy into their teaching practice. Megan noted in their journal that using the QAR made her more aware of the types of questions that were not being addressed in the text and prompted her to supplement the text questions with different questions during class discussions. Jan and Sally adapted their wait time between questions based on the type of questions being asked. This allowed for the class to spend more time on the higher order questions, working either individually or in groups to apply advance reasoning to their answers.

The multiple findings of this study resulted from the various ways that data was collected. The interviews, journals, and classroom observations provided key insights into how teachers think about their instructional practices. These findings allowed for me to determine ways to extend the research, which are discussed in the following chapter.

**Reflection Improves Practice**

Research question two dealt with the teachers’ feelings about the overall experience of implementing the literacy strategies into their classroom practice. The teachers found themselves reflecting more on the impacts of these strategies and their own teaching. This reflection led to an understanding that what they had been asking students to do in their classroom was more retrieval than higher order thinking. The lessons developed from reflection
on the new strategies included having the students draw upon prior knowledge to create connections for students to build upon and anchor the new information being taught.

This theme is directly related to research question two, relating the teachers’ experiences implementing the embedded literacy strategies into their science instruction. During the six-week period teachers were asked to reflect through journaling using seven different prompts. The prompts guided teachers to reflect on different parts of the implementation, effects on student learning, changes in their teaching, and how their overall thinking about their teaching may have changed. Teachers’ responses varied from a couple sentences to long paragraphs but when asked about the effects of journaling during the interviews every teacher said that journaling caused them to truly reflect on their teaching in a meaningful way. The longer reflections were those that focused on the impacts to student learning and how their lessons had changed to make those impacts.

Teachers spoke in their interviews and wrote in their reflections that the experience of implementing the QAR caused them to examine the questions they asked students and how they asked the questions. During the observations in a fifth grade classroom, Patty presented the initial lessons introducing the QAR question types to the students and then students were asked to create their own questions to share during a review lesson. The students were required to write questions in every category for their classmates to identify and answer. In Jessica’s classroom, students were required to identify the questions they were given as part of the lesson, answer the questions, and then rework them to make them into a different type of question. These types of lessons were different from previous lessons where teachers were solely responsible for generating questions for lesson review. Those review questions focused primarily on the content area taught in that unit but did not ask for the students to use previous
knowledge to make connections to the new knowledge being taught. Through the process of reflection teachers were able to see how their previous lessons did not expand on students’ prior knowledge and how they were not moving past the knowledge retrieval and comprehension learning skills. During a post-observation debrief Jan spoke of her desire to improve her lesson targets and extend her lessons to include higher order learning skills. The reflections and review of the observations that were completed in her classrooms illuminated how few learning skills she was requiring her students to use in their studies. This occurred multiple times with different teachers as they completed their reflection and reviewed the observation records. Many of them were shocked because they believed that they had been teaching students high level learning skills with their content area lessons.

A secondary theme that arose from this question was a greater sense of faithfulness to the implementation and the desire to maintain the instructional strategies beyond the initial lesson. Teachers felt they were held more accountable because of the required reflections and they felt that everyone was being held to the same level of accountability. In relation, teachers were more willing to stay faithful to the implementation if they were not the only ones doing the work. During the post interview Amy stated, “Knowing that I would need to reflect on how these instructional practices were affecting my teaching and write about it made me keep integrating them into my lessons,” (Amy, personal communication, November 13, 2015). This marked a definitive change from past practice as indicated by Megan in her post interview: “During other initiatives only a handful of teachers stayed true to the implementation while others would do it for a few weeks and as soon as they could they would stop using the new practices,” (Megan, personal communication, November 10, 2015). The teachers felt supported and heard through the process of reflecting and felt that all teachers were being held to the same expectation; these
feelings led to a desire to implement the literacy skills correctly and maintain the implementation.

**Scaffolding deepens Instruction**

Research question three examined the benefits and drawbacks of the literacy strategies being implemented in the classrooms. Overall, the teachers felt the benefits were greater than the drawbacks. The benefits were deeper class discussions that drew upon the students’ prior knowledge and allowed for teachers to examine their own lessons to make them richer for the students. As the teachers saw greater student engagement and the benefits to student achievement, they were more invested in learning how to use them in ways that created the most benefit for students. Teachers were also accessing the scaffolding that had been built by previous lessons and creating more opportunities for students to access higher order skills through examination of their own teaching styles.

Scaffolding lessons to include students’ prior learning provided teachers with the ability to deepen their instruction. The common practice for teachers is to plan the unit beginning with overall unit objectives. They then break the unit down into individual lessons that address each of the objectives with specific learning targets. Teachers use different methods for accessing students’ prior knowledge of the content area being taught in the beginning of each unit. As the unit progresses the teacher changes each day’s plans based on how much of the lesson they were able to provide the students that day. During the six-week implementation the teachers noted a common benefit of the literacy skills was the ability to access the prior knowledge through those skills and use that prior knowledge as scaffolding for building student understanding of new concepts and to go deeper into the content.
When reflecting on the implementation of pre-teaching vocabulary teachers spoke of improvements to student comprehension and classroom discussions. The vocabulary acted as a scaffold for the students to build the information in the chapter upon and allowed the students to connect the information to previously held knowledge. In Megan’s fourth grade classroom this was observed during discussion on project design; the students had been introduced to the vocabulary the day before and then had a review of the vocabulary prior to beginning the current day’s activity. During the initial vocabulary lesson and as words were introduced, several students responded that the words were familiar from the previous year’s lessons. As Megan went into further explanation of the words, students connected previous knowledge and experiences to the words providing them with a deeper connection to the words. Megan then steered the students to use the previous year’s experience to guide the conversation around project design and how they were going to build on it with the current project. When asked about the lesson later, Megan commented, “The lesson became better than planned because the vocabulary opened a vein of knowledge that I didn’t know existed. I am able to move further ahead and I have more time for them to work on the actual project,” (Megan, personal communication, October 28, 2015).

The QAR became a way for teachers to determine student comprehension and engagement in classroom lessons. During an observation of Jackie’s fourth grade literacy lesson, she provided the students with three questions before beginning their class read aloud. The first question was a “right there” question, and during the lesson debrief Jackie explained, “I had been using ‘right there’ questions to gauge the students’ attentiveness to the story,” (Jackie, personal communication, October 21, 2015). Jackie found that giving them a “right there” question tuned the students into the book. The next two questions were an “author and me” and an “on my
own” which Jackie explained were used to determine comprehension and to connect the student to the book. Previous to the QAR, Jackie would pause during her reading to ask a question of retrieval or comprehension question but never really connected students’ prior knowledge or own experiences to the novel. With the implementation of the QAR, Jackie found that students were able to connect to the read alouds better because they found connections within their own experiences with the guiding questions.

These novel connections crossed over into the students’ novel studies and writing. Teachers found that the students were able to identify the questions being asked and provided much more detailed answers to the questions because they were not getting frustrated by trying to determine what the question was asking. Students spent less time answering “right there” questions and were not searching the novels endlessly for “on my own questions.” The time students saved searching was transferred to the time students spent writing. The students wrote richer answers that demonstrated their connectedness to the reading by providing more details to how they felt when they read a passage or how their experiences were similar or different from the main characters. These deeper reflections the students provided in their writing also led to deeper discussions during class.

Time is essential for proper planning. While every teacher spoke positively about the use of both the QAR and pre-teaching vocabulary, the main drawback was the lack of time teachers had to plan for the use of these skills by their students. Teachers felt that while they were provided with professional development and support for the implementation, it took more time to plan for the literacy skills being implemented. The fluidity of content area instruction was more evident at the lower elementary level and they were able to loosen their ideas around specific time spent teaching the content area while still making sure that the lesson objectives for each
content area were taught. This was a cause for some frustration, particularly at the upper elementary level, because at first teachers felt they had to give less time to content area instruction to plan for literacy skill integration. Mallory spoke in an interview about having a difficult time finding enough time during the content area and still maintaining the time she felt she owed to her literacy block. This was resolved to some degree by having students read about the science content during the literacy block.

This research question was answered through the interviews, journal reflections, and classroom observations. The teachers all observed the benefits through student engagement in reading, classroom discussions, and the writings the students produced. The benefits for the literacy skills implementation had all the teachers agreeing that they would continue to use them in their lessons. The drawback of the time it takes to implement the lessons will hopefully lesson as they continue to become more accustomed to integrating the skills into their lessons.

**Time is Essential for Proper Implementation**

Research questions four and five asked about the resources and obstacles faced in implementing the strategies in the classroom. The answers to these two questions were intertwined with the answers being student readiness, time, and materials. In order to plan and create lessons that connect prior knowledge to the new knowledge, teachers need time. They also need materials to properly implement the literacy strategies such as non-fiction readers and access the other content area literature.

Teachers all agreed that the best resource and biggest obstacle was time. When asked in the post interview if there was any resource they could have had to make the implementation easier it was time for planning, time for working with their colleagues, and more time to work with their students. Time is the most precious and scarcest resource in education because no
amount of money can buy more time for working with students. Jan shared during a post observation debriefing that “For every minute that I spent planning for the implementation of the new literacy skills was one less minute I had for planning for the content area instruction,” (Jan, personal communication, November 4, 2015). Many of them felt during the early implementation that it was a tradeoff between the content area instruction and the implementation of the literacy skills. As the six-week implementation progressed and they began to see a change in student responses and the deepening of content instruction, the view changed slightly and the frustration seemed to abate but it never went away. This was evident in the post interviews when the majority of teachers listed time as the most needed resource and obstacle for the implementation of the literacy skills.

**Content Area Based Literature is Essential for Implementation**

Teachers felt if they were going to integrate literacy into the content area that they needed to be able to access literature that they could use during their literacy block. Aubrey stated during the post-implementation interview:

> Having to share non-fiction readers and having limited access to content specific books makes it difficult to give all students a chance to read those books. It is really hard when the selection is so limited because many kids do not have the same skills or abilities, (Aubrey, personal communication, November 13, 2015).

During post-implementation interviews, a common statement was that the new science program provided many opportunities to integrate the literacy into science but they were not able to reciprocate by using content area readers during literacy for all students. Many of the students were from low-SES homes and began school behind in oral language and early reading skills. The readers provided to go along with the new science program were written at a higher lexile
level than many students were currently reading.

Teachers did access other resources for students, such as classroom magazines, but those did not always match the current science content being taught. The magazines did provide literacy connections like the science program and reinforced the crossover of using literacy skills in the content area reading. Penny utilized the magazines every Friday during her science lessons. During an observation debriefing she shared, “The way the magazines are written allow all students to access the knowledge provided with engaging pictures and fun facts that make reading fun for the students,” (Penny, personal communication, October 2, 2015). The teachers developed a classroom library of non-fiction books to provide students with background reading during the unit being taught. The quality of classroom libraries range from teacher to teacher and not all teachers has the same availability of books for the classroom. Often the quality of the library is subject to the teacher’s interest in the content area or whether the specific content being taught has been part of the grade level standard for a long time. Non-fiction books are also available in the library but a classroom set of books is often not available. Those non-fiction books are also often written at a lexile level that is not comparable to the lower achieving students.

**Summary**

This phenomenological study was completed to gain understanding of how a select group of teachers’ views on their instructional methods change after implementing two specific literacy strategies. The participants were 12 teachers and three literacy specialists; their views from interviews and journals were collected and analyzed along with classroom observations and artifacts. An overview of the participants was given listed by their pseudonym and their views shared through select quotes that were taken directly from interviews.
There were five themes identified through coding the data gathered from interviews, observations, journals, and classroom artifacts. The themes reflected the teachers’ growing awareness of instructional practice, the need for reflection on teaching practice, the use of scaffolding to deepen comprehension, and the need for proper time and resources to provide instruction. The results were grouped by theme and linked back to the research questions in order to provide comprehensive answers to the research questions.
CHAPTER 5: DISCUSSIONS, CONCLUSIONS, RECOMMENDATIONS

Overview

The intention of this chapter is to provide answers to the research questions presented at the beginning of the study. The chapter begins with an overview of the study and the subsequent findings. The discussion provides a deeper look at the findings in relation to their implications in relation to relevant literature. The chapter then addresses the study’s limitations and postulates possible avenues for future research. The conclusion of the chapter summarizes the significant pieces of the study and its findings.

Summary of Findings

The purpose of this study was to examine how the implementation of two literacy skills into the science content area instruction impacted the metacognition of the teachers at Cole Elementary in regards to their own teaching practices. The participating teachers were veteran elementary educators with more than five years of experience and worked in a rural Maine elementary school in a low socio-economic area. The reasons behind this study were pragmatic, to gain insight into and knowledge of what will cause teachers to reflect on their teaching practice. “Reflection becomes more productive when it is comparative, viewing a critical incident from different perspectives; or critical, taking questioning perspectives that lead to new ideas” (Hayden et al., 2013, p. #). It is through reflection that teachers can determine which teaching practices make the most impact on student learning.

To guide this study in its findings the following research questions were explored:

**RQ1:** How does implementing disciplinary strategies change teacher metacognition of disciplinary literacy?
RQ2: How would teachers describe the experience of implementing the QAR and embedded vocabulary literacy strategies into science instruction?

RQ3: What do teachers perceive to be the benefits and drawbacks of the QAR and embedded vocabulary literacy strategies?

RQ4: What additional resources would have made an impact in implementing disciplinary literacy?

RQ5: What obstacles exist in implementing the disciplinary literacy?

Through the use of a wide range of data collection tools, an extensive collection of findings was compiled that allowed for the initial research questions to be answered. The findings suggest that use of disciplinary literacy, in terms of the QAR and direct vocabulary instruction, as teaching practices demonstrated to teachers how embedding literacy skills impacts their students’ ability link knowledge and create stronger scaffolding for learning. As a result, teachers restructured their lessons to include vocabulary lessons throughout multiple content areas and focused more on higher order learning skills instead of retrieval and comprehension skills.

The findings reaffirmed the positive aspect of reflection as a means for creating awareness of instructional practice while providing new insights into the use of reflection as a means of accountability of implementation of new practices. The main concern was that teachers who did not take time to truly reflect never saw ways to improve their own practice or adapt their practice to be more impactful for students. Thus causing the teacher to disregard new teaching practices.

Finally, the last findings revolves around the needs of impoverished students, the lack of time for planning, and resources on the teachers’ abilities to provide quality instruction for all
students. Impoverished students often have higher needs in regards to supplementing language and learning deficits from underexposure to books and cultural activities. Students with higher needs require more instructional time and therefore this reduces the amount of time available for the instruction of new materials. The inability for the teacher to meet all the needs of their students causes frustration for the teacher, as does the lack of resources needed to provide for all the students’ learning needs.

Discussion

The purpose of this section is to examine the results in relation to the theoretical and empirical literature reviewed in Chapter Two. This section is organized similar to the literature review first examining the theoretical and then the empirical relationships to the literature.

Relationship to the Theoretical Literature

The theoretical views shaping this study work in conjunction as well as stand-alone. Piaget’s (1964) and Anderson’s (1978) schema theory, Vygotsky’s (1978) social cognitive theory, and Dewey’s (1905) pragmatic theory all relate to the teachers’ ability to learn and apply new instructional techniques that will benefit students’ educational growth.

Piaget (1964) and Anderson (1978) use accessing prior knowledge known as the schema, to provide hooks to connect the new knowledge. Teachers use these hooks to connect student learning every day to provide a richer learning experience and allow for better retention of what they are teaching. During this study, the teachers accessed their own schema to connect what they knew about literacy and content instruction to the larger picture of disciplinary literacy. As the study progressed, their schema around how to provide more comprehensive learning for their students increased, as did their understanding of how to plan for instruction.
The social cognitive theory by Vygotsky (1978) utilizes the theory that teachers who have developed skills can help teachers who need to develop skills. As teachers became more familiar with the literacy skills, they relied on each other for planning lessons and activities that employed those skills. Both students and teachers accessed the zone as they learned to apply the skills, for students as they worked in groups a deeper understanding of how to categorize the questions and then how to write their own questions. The teachers worked together to increase the level of rigor that they were expecting from students.

The pragmatic view of Dewey (1905) looks at how to logically solve problems in education. The problem addressed by this study was how to implement literacy strategies to enhance student learning and provide a way for teachers to connect literacy to science content. By weaving literacy and science together, teachers create time that can be used for other learning opportunities. This solves the problem that teachers do not have enough time and addresses the need for students to be able to read content area literature.

Pragmatic theory connects the prior two theories in that it is logical for teachers and students to learn from each other to strengthen learning and provide growth. It is also practical for teachers to connect the learning across the content area and grow as a professional. Interconnected learning allowed for deeper comprehension for the students and the ability to learn from each other provides a way for academic growth.

**Relationship to the Empirical Literature**

Implementation of disciplinary literacy improves understanding. During the initial interviews, teachers involved in the study had very little understanding of disciplinary literacy as a whole beyond knowing that it involved using literacy skills in a discipline other than Language Arts and Reading.
They were focused more on the presentation of the content instead of the actual content, especially in science where they had very little in terms of materials and had to create every lesson for the students. Prior to the current science program, teachers spent hours researching videos, experiments, and demonstrations that could be used in the classroom to create a well-rounded science lesson for their students. Cross-content learning skills, vocabulary, and supplemental readings were not even considered when developing lessons. Before the implementation, teachers were provided training on how to integrate the specific literacy skills into the science content area. As teachers worked through the six-week implementation, they gained a better understanding of how disciplinary literacy created connections for their students resulting in better comprehension.

Three years ago when the new science program was introduced teachers began to shift their instruction based on the new resources available. The new science program included a textbook that was specifically written to connect to current literacy standards. Many teachers reported that as familiarity of the program progressed, the incorporation of the textbook features increased. During the post-interview Penny stated, “I am finding that, um, it is becoming more natural to just add those things in as I become more familiar with the program and what I need to teach.” Teachers did not consider implementing disciplinary literacy because the use of the literacy skills was not consistent and there was no noticeable carry-over between the disciplinary areas. Teachers felt the skills from the science textbooks were more like a reinforcement of the skills taught during the writing and literacy blocks. As the teachers began the direct instruction of the vocabulary, they found that students were able to comprehend the lessons with more ease. As found in the literature review, the connection between comprehension and vocabulary varies.
strongly (Beck, McKeown, & Kucan, 2013) and a student’s ability to succeed in school is impacted by their general and content specific word knowledge (Perfetti & Adolf, 2012).

Dymock and Nicholson (2010) successfully demonstrated that students with a larger working word base were more successful in content area reading because they could decode the meaning of words more efficiently. A new finding of this study is the impact that pre-teaching vocabulary has on accessing the knowledge scaffolding that students had previously built. When students were able to connect the word to the idea being taught, they were able to recall the previous lesson from prior years and apply that learning to the new concepts. This ability to connect to previous students’ learning made the teachers excited about using the embedded literacy skills further. Teachers began to think about the words they were teaching and how to choose the best words to provide students hooks for their new learning while expanding their word knowledge.

During the entirety of the study teachers became more aware of how disciplinary literacy impacts both the way they taught science and how they were able to blend their literacy block and science block to provide more time for both during the instructional day. As witnessed in the literature review, the study completed by Norton-Meier et al. (2013) on the integration of literacy into the science area created a more complex understanding of concepts and richer writing produced by students. This was demonstrated in this study through students using their expanded vocabulary during their writing throughout the day. Students were using words taught in the direct instruction of vocabulary in their daily writing journals or during their small moments stories during their writing block. Teachers also saw an increase in the use of text features that were modeled in the science textbook or other nonfiction reading materials.
The teachers also noted that students were transferring the QAR method for identifying questions between the literacy block where it was taught and the questions presented in science. Teachers began to implement more opportunities for students to be able to use the QAR, asking them to identify questions that were in the book using QAR terminology. In one classroom students were asked to change the question from a “right there” question to an “author and me” question before sharing it with another group. This familiarity increased usage by both teachers and students, which led to tasks becoming more complex, and requiring students to use higher order skills for task completion. This finding is not surprising as the literature review mentioned, “accessible content and literacy strategies help students gain deeper understanding” (Faulkner 2012, p. 3). The finding is further demonstrated through the use of the direct vocabulary instruction; teachers were able to access the schema that students had built from previous learning experiences. Through the utilization of Anderson’s (1978) schema theory, the teachers then connected that previous knowledge to the new concepts, which anchored the learning for the students.

Reflection causes awareness of teaching practice. As teachers continued through the six-week implementation the reflections on teaching practice began to deepen. The deepening of reflection on practice occurred primarily around how their lessons needed to change to account for student engagement and gaps in student knowledge. As noted in the study, teachers began to adapt their practice as they became more aware of the impacts the embedded literacy techniques were having on the students’ learning. The adaptions included increased vocabulary instruction in all content areas, providing different types of questions for students to use to demonstrate understanding and application of knowledge, and allowing students to create their own questions to answer.
The findings of this study support the conclusion that teachers who reflect are more aware of their instructional practice and are able to adapt their instruction to meet the needs of their students (Broyles et al., 2011). This awareness of instructional practice is essential because many of the teachers were continuing to teach as they had been taught both throughout their years in school and during their professional development as teachers. The comfort of what was known never pushed them to adapt their practices. Teacher responses during the interviews demonstrated that they considered themselves to be thoughtful practitioners and that they were teaching in a way that they felt was best suited to students’ learning. The process of reflection and the focus on trying new techniques provided the lens teachers needed to see what their students needed to be successful. The literature review highlighted the importance of reflection as method of making lasting impactful change. It is the ability to widen their view to see both the positive and negative aspects of their teaching that causes them to make the most impact as a teacher (Ellis et al., 2014). During debriefing of classroom observations and the post interviews, teachers spoke to the need of reflection moving forward and the impacts it had on their practices. The reflections required for the study made them more aware of the lessons they were planning and the need to change them to meet the needs of students. In the study by Ramos (2012a), the teachers that reflected on their instructional decisions better met the needs of their students. This was echoed in this study by the teachers reflecting on the science lessons and providing different types of questions and vocabulary based on the needs of the students.

Reflection caused a secondary finding in that the teachers felt they were more accountable for the faithful implementation and following through with the instructional practices. All of the teachers interviewed stated that knowing that everyone was required to write reflections made them feel that they were part of a larger whole and that everyone was
sharing in the work. Systematic reflection was discussed in the literature review as a means of improving teacher motivation and engagement in the classroom (Ellis et al., 2014). This systematic reflection on their instruction was shared between teachers and increased communication in the grade level teams. The discussions that arose from teachers’ reflections about instructional practice permeated into staff meetings and professional development time. This ripple effect caused by reflection on instructional practice led to school wide reflection on how to meet the needs of the students allowing teachers to access the zone of proximal development. It is important to encourage teachers to continue working within the zone of proximal development to increase their growth as professionals.

The school wide reflection led to the realization that some teachers who did not engage in the more in-depth reflections did not realize that they were negatively impacting their students by their unwillingness to adapt their instruction. These teachers, when interviewed, were the ones that had not been extending their learning through taking college classes beyond their initial degree, seeking out new professional development opportunities, or engaging in professional learning circles within the school. The teaching style of these teachers is very traditional with the teacher providing the information to the students in a more lecture type format instead of the students being a more active participant in the learning environment. The zone of proximal learning is very rarely engaged or taken advantage of for students who learn best from working with the materials or their classmates. The teachers fail to acknowledge their own inability to engage students in learning and their students’ lack of achievement in the learning environment. The literature states that teachers will fail to thrive, have a low motivation to adapt teaching practices, and will overall be less successful when they cannot acknowledge the faults in their
teaching practice (Ellis et al., 2014). How to bring awareness to teachers who have not learned to properly reflect will be addressed in the implications section of this chapter.

One of the greatest obstacles that teachers faced during the study was the time that was required for teachers to prepare the lessons for the students at such diverse levels of achievement. The majority of students that attended the school came from poverty and many came to school with significant gaps in knowledge that students who come from more affluent areas do not experience. These gaps include reduced word knowledge due to cultural background and coincide with the findings in the literature review (Sinatra, 2008). The kindergarten teachers found that when prompting students with “right there” questions during read alouds they would need to choose their wording very carefully and often provide more background on the book before beginning the reading. This coincides with the findings that children from low income areas often lack language skills beyond those needed to communicate their everyday needs (Bhattacharya, 2010). Teachers at higher grade levels found that the nonfiction reading materials were beyond many of their students’ abilities because students lacked the ability to comprehend the vocabulary in the texts. This required teachers to adapt their materials which reduced the amount of time they had for planning lessons.

The impact to the teachers’ time is one of the greatest drawbacks and obstacles in terms of using the embedded literacy skills within science instruction. Students from impoverished backgrounds need instruction on how to organize information and how to communicate what they have learned in order to be successful in the classroom (Price, 2010). This instruction takes away from the teacher’s time for planning content area instruction and reduces the opportunities they have for implementing new instructional strategies that require higher order learning skills.
The higher order skills need students to have a knowledge base and a larger working vocabulary than is held by many of the impoverished students attending school.

A second finding is that adequate resources must be available for teachers to be able to properly implement the embedded literacy strategies. The teachers do not have nonfiction readers that match the student reading levels. Students from impoverished backgrounds often read below grade level because of the lack of early reading skills impacting their ability to develop reading skills as quickly as their peers from higher socioeconomic backgrounds (Hartas, 2011; Wise et al., 2007). While each grade level was provided with a set of nonfiction readers for their science program at their grade level, the actual reading level of the students was lower than the lowest level written for that grade. This means teachers are spending time modifying the supplemental materials as well as trying to help students comprehend what they are reading. This is a deterrent for teachers to include other types of readers beyond the textbook into their lessons.

Another obstacle is that teachers do not have a comprehensive list of vocabulary that is being taught across all grade levels. The teachers spoke of their need to coordinate across the grade levels and content areas to create comprehensive lists of vocabulary words to be taught to increase the word knowledge of all students. Teachers felt that by coordinating the vocabulary lists they could ensure that all students had equal opportunities to increase their word knowledge, leading towards students overcoming gaps in achievement created by the students’ backgrounds. Bhattacharya (2010) determined that it is a possibility for students to overcome the gaps, provided the student is supported by both the school and the parents through high level engagement in literacy activities.
The research questions guiding this study were answered through a variety of sources collected during the duration of the study. This extensive collection of data allowed for an extensive evaluation of the knowledge gained. This knowledge led to several findings and created new questions to be explored in future research studies.

**Implications**

The implications of this study are best viewed at the teacher, school and district levels. For teachers the implications are focused on classroom practice, at the school level the implications are on providing the best professional guidance for teachers, and at the district level the implications are on the new teacher evaluations being required by many states.

**Teachers**

Elementary teachers are responsible for ensuring that students make academic gains in every core subject area. This expectation has encouraged teachers to incorporate literacy skills throughout the day and broaden how they view their own instructional style (Guzzetti & Bang, 2011). It is important that teachers have a means to integrate these skills and be reflective about how their own teaching practice changes as they implement new strategies.

Throughout the study the impacts of reflection on teaching practice was evident for not only the implementation of the two literacy strategies. From the pragmatic viewpoint providing teachers with reflection time or even making reflection an expectation benefits students, teachers, and the school. This reflection time can increase motivation and recommit individuals to their profession when it is focused on the positive aspect of the initiative being implemented (Ellis et al., 2014).

The new evaluation systems can also propel teachers toward improving their professional practice by the requirement of being a life-long learner. This study demonstrated that unless
required to, many teachers would not take the initiative to further their professional development unless the school offered the course or workshop. However, as the findings of this study exhibit, the teachers do find value in learning new instructional techniques and will maintain implementation when they feel the techniques positively impact student engagement and learning. The Kinniburgh and Baxter (2012) study supports this ascertain, as teachers were better able to assist students when they received proper training and implemented the strategy properly.

**Schools**

With the onset of these new evaluations, school administration teams can set the expectations for teachers to be reflective collaborators that put student learning first. Administrators will need to hold teachers accountable for systematic reflection that enables them to shift from egocentric view of their instruction to reflection on how they are being seen from the perspectives of the students, peers, and administrators (Henry et al., 2011). By holding teachers accountable through the new evaluation system, administrators can capitalize on teachers’ feelings of accountability towards proper implementation of new initiatives felt by the required reflections.

**School Districts**

School districts across the nation are instituting new teacher evaluation systems that require teachers to continuously improve their practice through professional development. The evaluation system also requires teachers to provide differentiated instruction for students so that students are able to learn at their instructional level. In order to accomplish both of these goals, teachers must be reflective practitioners and collaborate with both their colleagues and their administrators (Marzano, 2012).
Limitations

The limitations for this study arise from its inability to be generalized due to the participants in the study being from an extremely impoverished, rural school district. The sample size was chosen from one elementary school within the district and possibly limited the generalizations to only elementary teachers who taught science. Recognizing that the teachers who participated were willing to explore new instructional methods, the research found this sample group to provide quality insight into the use of disciplinary literacy as a means for creating metacognition on instructional strategies.

The sample was also chosen based on the teachers’ willingness to participate in the study and other participants could experience the phenomenon in a completely different manner. The teachers’ personal experiences, biases, and motivations could be a significant factor in their experience during the research period. While these personal influences were unavoidable, gathering perspectives from a varied number of individuals of the common phenomenon afforded clarity (Smith et al., 2009).

Disciplinary literacy at the elementary level has not been widely explored and its effects on how teachers view it as a classroom organization technique are very limited. With increased focus on students demonstrating proficiency in all content areas, disciplinary literacy could become a solution for schools. The relatively short time frame of this study allowed for a very narrow view of this issue in education.

Recommendations for Future Research

For this study, I focused on how new instructional strategies impacted how teachers viewed their own practice and how the strategies made them think about how they teach students. The teachers were all part of a group that worked with a science program that lends
itself to disciplinary literacy. Future studies may focus on disciplinary literacy in content areas where there is not a core program that is literacy based or where there is no core program for the teachers to use as a base for instructional planning. Several teachers mentioned that the social studies content area is very loosely organized with no cohesion between teachers at grade level beyond having to meet the same standards.

A future quantitative study on how the use of disciplinary literacy affects student achievement is recommended as it relates to teacher effectiveness on the new evaluation systems. Investigating both the quantitative results as well as the perspectives of the students could provide teachers with further understanding of how varied instructional strategies can increase student engagement and investment in their education. These two studies can also provide teachers with ways to differentiate instruction based on the student perspective of what was the most helpful for their learning.

Quantitative measures of student achievement are required by most of the new educator evaluation systems. Future research on the impacts of disciplinary literacy skills implementation on student engagement and standardized test scores could be used for those evaluation systems.

**Summary**

The general purpose of this phenomenological study was to understand how implementing disciplinary literacy into the science content area impacts primary grade teachers’ metacognition of disciplinary literacy. This research focus addressed the void in the literature about the perceptions of teachers implementing disciplinary literacy at the elementary level using a combination of the QAR method and direct instruction of vocabulary in the science content areas. I interviewed 12 teachers along with completing classroom observations and having the participating teachers journal about the experience. These participants were selected based on a
criterion and convenience sampling method that allowed for a specific sample set that was convenient to the researcher (Creswell, 2013). The face-to-face interviews provided rich data that detailed the participants’ experiences and were supported by the journals and classroom observations.

My findings exposed three themes relating to how the implementation of embedded literacy strategies impact teachers’ metacognition of their teaching practice, teachers develop an awareness of teaching practices and how content is presented to students, reflection improves practice, scaffolding provided teachers with the ability to deepen their instruction, and time is essential for proper planning. Teachers experiencing the integration of disciplinary literacy and direct instruction of vocabulary into their science instruction found that students were able to access previous gained knowledge through the use of pre-teaching vocabulary. Teachers began to change the lessons they had written prior to the use of the embedded literacy skills to adapt them to include higher order learning skills. The need for more time to plan, adapt, and create lessons that are rich in higher order skills and that provide differentiated learning for students is not a new finding but it is worth noting because increasing demands on teachers’ time can reduce the quality of lessons they are able to deliver to students. The most prevalent theme is that systematic reflection provides teachers with a clearer view of the impacts they are making within the classroom. Reflection is also important for teachers to use in terms of improving their own practice as professionals and elicits feelings of accountability for proper implementation of new instructional methodologies.

There are two major implications for practice with the first being for instructional leaders that are implementing new instructional strategies or looking to provide professional development for teachers. Instructional leaders need to be aware that many teachers do not seek
out opportunities for growth beyond what is provided by their school district. When these new initiatives are presented, in order to maintain faithful implementation teachers should be asked to provide reflection on the implementation. This provides teachers with a sense of accountability and the understanding that everyone is expected to contribute to the success of the implementation. The process of reflection also shifts teachers’ mindsets towards being more thoughtful practitioners who focus on the students’ instructional needs.

The second implication is for school districts that are using new teacher evaluation systems. The new evaluation systems for educators have brought about an understanding that teachers can no longer rely on past practice to be effective in the classroom. Using the standards in the new evaluation systems school districts can require that teachers seek out new opportunities for professional growth to improve instructional practice. Affording teachers with the chance to collaborate with their colleagues will enable them to see the benefits to students on a larger scale and increase their investment in the new instructional strategies.

This research has provided me with insights into how teachers think about their instructional practice when presented with two specific literacy skills to embed within the science content area instruction. Within this specific context, I was able to see that teachers will adapt the practice and that when required, teachers will use reflection to improve their practice to be the best they can as professionals. As one teacher said during their debriefing when asked about reflecting on that day’s lesson, “When I have time I try to reflect but that time is hard to come by when I have to plan for everything else.” It is up to the instructional leaders to help teachers find the time to be reflective if they want to have quality educators working with students.
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559-589.
May 10, 2015

Kelley Weiss

IRB Approval 2198.051015: A Phenomenological Study on the Impacts of Embedding Disciplinary Literacy on Elementary Teachers’ Metacognition of Instructional Techniques

Dear Kelley,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

Professor, IRB Chair Counseling

(434) 592-4054
APPENDIX B: Consent Form

The Liberty University Institutional Review Board has approved this document for use from 5/10/15 to 5/9/16
Protocol # 2198.051015

Informed Consent Form

Increasing a Teacher’s Understanding of Disciplinary Literacy Using Embedded Literacy Techniques
Kelley Weiss
Liberty University School of Education

You are invited to be in a research study of disciplinary literacy within the science content area using the embedded vocabulary method of teaching. You were selected as a possible participant because of the grade level you teach and your implementation of the new science program. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Kelley Weiss, a doctoral candidate in the School of Education of Liberty University.

The purpose of this case study is to understand how implementing disciplinary literacy using the embedded vocabulary method of instruction into the science content area affects how teachers adapt overall literacy instruction to increase transfer and synthesis of knowledge. At this point in the research, the science content area will be the primary focus for implementation of disciplinary literacy using the embedded vocabulary instructional method.

Procedures:

If you agree to be in this study, I would ask you to do the following things:
Data will be collected through one-on-one participant interviews; which will take about 30 minutes to complete. These interviews will occur in June before the professional development, after all the signed consents are collected, and in October after the six week implementation period. The interviews will be audiotaped and transcribed.

Complete a journal based on suggested prompts during the six week implementation period from the end of September through October.

Allow for classroom observations twice a week during the six week implementation. Participate in the collection of artifacts and documents that demonstrate the implementation of the teaching strategies during the six week period.

**Risks and Benefits of Being in the Study:**

This study poses no more than minimal risks. There are no direct benefits for participating in the study. The expected benefits to society associated with your participation are the information gained from describing the effects of using embedded vocabulary instruction, which may lead to expanding the concept of disciplinary literacy across the grade levels or to other schools in the district.

**Compensation:**

You will not receive payment for participation in this study.

**Confidentiality:**

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only I will have access to the records. All the participants will be assigned a number to protect their identities, and their recorded interviews will be digitally stored on a locked drive with the interviewer for three years after the study. The files will be destroyed after
three year minimum time which regulations require has passed.

**Voluntary Nature of the Study:**

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or MSAD #31. If you decide to participate, you are free not to answer any question or withdraw at any time without affecting those relationships. Should you choose to withdraw please let me know at anytime via email Kweiss4@liberty.edu and I will destroy any data that is associated with your participation in the study.

**Contacts and Questions:**

The researcher conducting this study is Kelley Weiss. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at 207-478-2915 or Kweiss4@liberty.edu. You may also contact her dissertation chair Dr. Casey Reason at creason@liberty.edu. During the interview process, observations, or any other point in the study, please do not hesitate to ask any questions relating to the study.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24515 or email at irb@liberty.edu.

**You will be given a copy of this information to keep for your records.**

**Statement of Consent:**

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

☐ I agree to be audio recorded for the study.

Signature: _______________________________ Date: _______________
Signature of Investigator: __________________________ Date: ________
APPENDIX C: Interview Questions

Semi-Structured Pre-Implementation Interview Questions:

General Educational Experiences as a student of science and literacy:

1. Describe your formal education within the discipline of science.
2. Describe your formal education within the discipline of literacy.
3. Define “scientific literacy.” Do you promote scientific thinking in your curriculum?

Experiences in Science Teaching:

4. Describe your experiences in teaching science prior to the new science program.
5. Describe your experiences in teaching science with the new science program.
6. What methods did you use to teach vocabulary before the new science program?
7. What were your experiences with science terminology?
8. What methods did you use to teach vocabulary with the new science program?
9. What experiences have added to your development of “scientific literacy?”

Knowledge, Skills, and Dispositions of Teaching Literacy:

1. What are the most common teaching strategies you use? Why do you use them?
2. Define “inquiry.” How do you integrate inquiry into your practice?

Final Thoughts

3. Is there anything else you would like to mention about your experiences with teaching science and literacy?

Post-Study Structured Interview Questions:

1. Has embedded literacy instruction (ELI) transformed the way you teach science? If so, how? If not, please describe why ELI has not been transformative to your practice.
2. How much ELI integration was necessary for you to integrate into your practice in
order to help build students’ literacy skills?

3. What level of literacy premeditation was necessary for planning effective science lessons in order to further develop students’ disciplinary literacy?

4. What lessons or strategies did you use that seemed to be the most successful for developing students’ disciplinary literacy with ELI?

5. How did school-level factors influence your curricular emphasis in the classroom?

6. How did personal interest influence your curricular emphasis in the classroom?

7. What resources could have made the implementation of the ELI more successful?

8. Were there any obstacles in implementing the ELI?

9. Were there any drawbacks to using the ELI?

10. Any final thoughts you would like to add?

**Interview Questions for the Literacy Coach and Title I Interventionists:**

2. Has embedded literacy instruction (ELI) transformed the way you support the teacher’s in the classroom? If so, how? If not, please describe why ELI has not been transformative to your practice.

3. What level of literacy premeditation was necessary for assisting the planning effective science lessons in order to further develop students’ disciplinary literacy?

4. What lessons or strategies did you provide for teachers to use that seemed to be the most successful for developing students’ disciplinary literacy with ELI?

5. How did school-level factors influence your ability to help the teachers implement these curricular emphases in the classroom?

6. How did personal interest influence your assisting the teachers?

7. What other factors influenced your ability to help teachers with the implementation of
Final Thoughts

1. Is there anything else you would like to mention about your experiences with teaching science and literacy?
APPENDIX D: Selected Pre- and Post-Interview

Initial Interview Beth

June 2, 2015

Interviewer: This is the initial interview with BI she has been teaching about ten years. So we are going to begin with your educational experiences, can you tell me about your formal education in the discipline of science? Have you had any science courses or were they mostly your methods courses?

Beth: Methods, just my methods

Interviewer: What about your formal education in the discipline of literacy? What literacy classes have you taken?

Beth: Um, the methods and then the reading recovery with Janelle and then the Lucy Calkins with Betty.

Interviewer: What would you define scientific literacy as?

Beth: scientific literacy?

Interviewer: Yes, what would make a person scientifically literate or what would somebody having knowledge in terms of science be in terms of literacy?

Beth: Classes, taking classes, reading and writing up on science. Understanding the vocabulary

Interviewer: Do you or have you promoted scientific thinking in your curriculum or in your classes?

Beth: I introduce science by having them learn about the outside

Interviewer: You also use the “Sid the Science Kid” videos about thinking like a scientist

Beth: Yes and science journals

Interviewer: Describe your experiences in teaching science prior to the new science program
Beth: We would just have units, and pull things together for those units.

Interviewer: So your units were all self constructed

Beth: Yes

Interviewer: Describe your experience in teaching science with the new program, using the new stuff

Beth: Um, with the new stuff it is more, it is all basically in the one unit with them giving us the materials. There really isn’t a lot of hunting anymore for what we have to do.

Interviewer: So it is all-inclusive

Beth: Yes

Interviewer: What methods did you use before to teach vocabulary related to science before the new science program, or when did you teach the vocabulary was it context based or was it more of when you came across it?

Beth: Just when we came across it

Interviewer: What would you say your familiarity of science terminology was or is?

Beth: mine, was just basic life terms

Interviewer: It was really just contained to the areas you taught, you were not getting extensive in your science terms.

Beth: no, not at all

Interviewer: What methods do you use to teach science vocabulary with the new program?

Beth: the book gives us a lot of those words, and information about it

Interviewer: So what experiences so far have helped you develop your scientific literacy, would it have been your being exposed to the new science curriculum and been building the new standards, your own reading of articles
Beth: The new program has helped; it has actually shown me how to have the kids ask more questions. Before the program we would have never asked those questions.

Interviewer: Now we are going to talk about your teaching of literacy, what are the most common teaching strategies you use when teaching literacy?

Beth: Like, um, one to one, small group, um, use the picture, or all the beginning reading strategies.

Interviewer: and, um, you also do a lot of word work?

Beth: yes we have them build words

Interviewer: What have you found to be the most helpful for students? Do you have a certain set of strategies that you use?

Beth: definitely having them find chunks in words once they are established in kindergarten and can identify the letters

Interviewer: What is inquiry?

Beth: Inquiry, when you look deeper into something

Interviewer: How do you integrate inquiry into your literacy practice?

Beth: Um, I would say that would be when we do if you know this part of the word then you can discover this word.

Interviewer: Is there anything else you would like to mention about your experiences in teaching science and literacy?

Beth: No

Interviewer: Thank you for you time.
APPENDIX E: Post Interview Penny

Interviewer: Good Afternoon, this afternoon we are going to be talking about the embedded literacy you have been using with the QAR and the vocab. So can you tell me how has the embedded literacy instruction transformed the way you teach science?

Penny: So one thing that is important in teaching science is pre-teaching that vocab, so I always put the vocab words up ahead of time. Before we even start the work in the chapter we go over the vocab words, we talk about what they already know about the words so that they have some hooks when they get into the book and encounter those words in the book. They can have some sort of connection with those words. As far as the QAR, often times in our science program it lends itself to the four types of questions with the QAR so I will say to them often times, this is a right there question, I need you to look right in your book, its there, I need you to look this up. Or this is an on your own question, think about your knowledge, you don’t need to look in the book for it. So it is really pre-teaching and using that vocabulary that is helping them with the lessons.

Interviewer: Do you think this has transformed the way you teach?

Penny: I think so, I think it has made me more aware of how important that is. The vocabulary in our science program is not easy, so I think it has made me more aware of helping them with their understanding of it.

Interviewer: How much of that literacy integration was necessary for you to integrate into your practice, had you already begun to integrate and was this just another piece?

Penny: Yea, I think I already had just because the science program lends itself to that and I really try from the very first lesson, from day one, for them to expect that literacy is a part of science, that I want them to see that connection, that we use so many of the pieces in literacy in
science, as far as main idea and using text features and some of those things. I think that has just been something from day one that we have, that I have stressed with them. So now it is just kind of an expected thing.

Interviewer: How much premeditation was necessary on your part for planning those effective science lessons?

Penny: Umm, more at the beginning when I was first getting my feet wet in my science program. I am finding that, um, it is becoming more natural to just add those things in as I become more familiar with the program and what I need to teach. Ah, so, at the beginning I think there is much more pre-meditation that you have to do.

Interviewer: What lessons or strategies did you use that seemed to be the most successful for developing students’ disciplinary literacy with ELI?

Penny: Um, I think one of the strategies that helped me is the fact that we regroup for science so that I have two different groups of science students. One of the groups is able to take things at a bit faster pace but also a bit more independent pace. So that um, that group that needs more work with integrating that, gets more of my actual teaching of it because some kids this is much harder for than others. Especially if you have a child who is a title 1 reading student or special ed reading student. They need a lot more support with integrating that, so by regrouping I am able to give support to the kids who need it.

Interviewer: Do you find yourself using more, like, when I did the observations of your class I saw that you hit every level of blooms from synthesis down to basic knowledge, do you find yourself using more of those intro level skills with one group verse the other group?

Penny: Ah, I try to teach, I try to make sure both groups get all of those levels but I feel like I get to it in a different way with the group that needs more support from me. I feel like I want to
make sure that both groups get the same information but it is more how I teach it to them that changes, if that makes sense. I don’t want one group, to not get the same information, at the end of the book, when I assess them they are getting the same assessments and their assessments come out very close to each other. I just want to make sure that continues to happen, that their getting the same stuff.

Interviewer: How did school-level factors influence your curricular emphasis in the classroom?

Penny: Well, I think one thing that has really helped me is that this science program is literacy heavy, so that the science program I am using lends itself so well to it that I don’t have to add a lot of extra things in because its there. If I am following the program and I am using the teacher book, they give so many different suggestions on how to put literacy into science that, that helps me and makes it easier.

Interviewer: Are you finding that you are able to focus on how you teach verse what you teach?

Penny: Exactly, yes exactly, you know it is right there what I am going to teach and so now I can dig deeper into how am I going to do that. Especially, with two distinct groups, I can really focus on, what is the best way to teach this group what I need to teach verses the other group.

Interviewer: How did personal interest influence your curricular emphasis in the classroom?

When you decided to regroup and you took on the science curriculum was that a personal choice?

Penny: It was actually two fold, my teaching partner at the time her emphasis was in Math and she really wanted to stick with the math. It was a brand new science program we were getting which I had a lot of interest in the science program and had served on the science curriculum committee so I was anxious to delve into that and check it out so it kind of worked that I was able to implement that its first few years.
Interviewer: What resources could have made the implementation of the literacy strategies more successful?

Penny: Um, I think that we got this year some of the literacy books that go with the program and I think that is helpful because that again is just one more piece too. I think extra things like that are helpful, those resources.

Interviewer: Were there any obstacles in implementing these literacy strategies.

Penny: Uh, no I think biggest obstacle is again those kids that have either a learning disability in reading or a um, a bit, even a bit below grade level in reading there going to need more support with it because it is so literacy heavy that you don’t those kids just because they have a deficiency in reading you don’t want them to be behind in science because some of those kids science is their strength. So you want to make sure they have an opportunity to flourish in science. I have one student in particular that is special ed and he gets threes on all his assessments because I don’t want that literacy piece to hinder the growth they can make in science.

Interviewer: Were there any drawbacks to using the embedded literacy?

Penny: Uh, no, I don’t think so. I do think it takes planning and it takes time. Thank fully I have an hour every day for science, you know, so I do feel like I have the time to take to put plenty of literacy in there. Um, but as long as you have the time and again it takes time and planning.

Interviewer: Any final thoughts you would like to add?

Penny: Uh, Nope, the only other thing I added was that every week I also do Scholastic News with my kids and I think that is another place where you can really, um, get that literacy instruction in. It is a current event paper, but you get so much literacy in there as far as context
clues as main idea and graphic organizers and inferring and predicting. Um, and it’s a good non-fiction piece, it gives them another non-fiction piece besides their science book to glean information from and to use the literacy. I just think that is an important resource as well.

Interviewer: Thank you very much.
APPENDIX F: Sample of Classroom Observation Notes

Observation Notes and Procedures

Classroom observations was completed on October 26, 2015

<table>
<thead>
<tr>
<th>Observation for Embedded Literacy Study</th>
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<tbody>
<tr>
<td><strong>Researcher name:</strong> Weiss</td>
</tr>
<tr>
<td><strong>Teacher Name:</strong> Megan</td>
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<tr>
<td><strong>Grade level:</strong> 4</td>
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<tr>
<td><strong>Interpretive lens:</strong> Schema</td>
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<tr>
<td><strong>Time Scheduled for Observation:</strong> 1:30-1:50</td>
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**Science or Literacy Observation**

**Observation Notes:**
- Vocabulary review of current terms
- Students played a game for pyramid vocab
- Pairs of students traded off giving definitions to have the other guess the word

**Questions:**

**Debrief Notes:**
What methods of vocabulary instruction were used?
Recall and Repeat exposure

What skills transferred between subject areas?
Use of vocabulary words and definitions: Comprehension, Knowledge Utilization, Retrieval

**Questions for follow-up with teacher:**
How many times have students interacted with these words
APPENDIX G: Journal Prompts

Journal Prompts for Reflection on Disciplinary Literacy Implementation

1. How do you feel pre-teaching the vocabulary affected the students’ understanding of the reading during today’s lesson?

2. How are you able to connect the using the question-answer relationship to your use of literacy skills during the content area lessons?

3. How has using the question answer relationships changed how you approach a lesson?

4. How have you been able to move literacy skill into the science, math, or social studies content area?

5. When you are planning for instruction what is impacting what literacy skills you are having the students use in the lessons.

6. How has implementing literacy into the science lesson changed your literacy block?

7. How has spreading literacy into other parts of your day changed how you think about your teaching?
APPENDIX H: Classroom Artifacts

Example of third grade vocabulary list for pre-teaching

Example of QAR chart used as a visual reference for students while working
### APPENDIX I: Enumeration Table

*Open-Coded Responses as they Occurred Across the Data Sets and Themes Developed from those Codes*

<table>
<thead>
<tr>
<th>Open Code</th>
<th>Number of times occurred throughout interviews, observations, and teacher reflections</th>
<th>Themes</th>
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<tbody>
<tr>
<td>QAR impact on student learning</td>
<td>11</td>
<td>Teachers’ develop an awareness of teaching practices and how content is presented to students.</td>
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<tr>
<td>Use of varied teaching strategies</td>
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<td></td>
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<tr>
<td>Impacts of vocabulary on student learning</td>
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<td></td>
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<tr>
<td>Developing better questions for students</td>
<td>5</td>
<td>Reflection improves practice</td>
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<tr>
<td>Feeling of accountability</td>
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<tr>
<td>Awareness of types of instructional strategies</td>
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<td></td>
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<tr>
<td>Higher order thinking was connected to adjusted teaching practice</td>
<td>21</td>
<td>Scaffolding provided teachers with the ability to deepen their instruction.</td>
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<tr>
<td>Understanding the students were able to connect to prior knowledge</td>
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<td></td>
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<tr>
<td>QAR impact on instructional time</td>
<td>20</td>
<td>Time is essential for proper planning and implementation</td>
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<tr>
<td>Mention of needing time to work with colleagues</td>
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</tr>
<tr>
<td>Impacts of vocabulary on instructional time</td>
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<tr>
<td>Using non-textbook based instruction</td>
<td>12</td>
<td>Content area based literature is essential.</td>
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<tr>
<td>Impacts of using content based reading materials</td>
<td>10</td>
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