TEACHERS’ GROUP REFLECTION AND THEIR FACILITATIONS IN IMPLEMENTING COLLABORATIVE REASONING DISCUSSIONS: A QUALITATIVE STUDY

Emmanuella Swastika Datu
TEACHERS’ GROUP REFLECTION AND THEIR FACILITATIONS IN IMPLEMENTING COLLABORATIVE REASONING DISCUSSIONS:
A QUALITATIVE STUDY

By
EMMANUELLA SWASTIKA DATU

Master of Arts, University of Wisconsin-Madison, Madison, Wisconsin, 2013
Bachelor’s in Education, Sanata Dharma University, Yogyakarta, Indonesia, 2009

Dissertation presented in partial fulfillment of the requirements for the degree of
Doctor of Education
Curriculum Studies

The University of Montana
Missoula, MT

December 2020

Approved by:

Scott Whittenburg,
Graduate School Dean

Jingjing Sun, Ph.D., Chair
Department of Teaching and Learning

David Erickson, Ed.D
Department of Teaching and Learning

Kate Brayko, Ph.D.
Department of Teaching and Learning

Daniel Lee, Ed.D.
Department Educational Leadership

Pablo Requena, Ph.D.
Department of Modern Languages and Literature
University of Texas at Santo Antonio
Teachers’ Group Reflection and Their Facilitations in Implementing Collaborative Reasoning Discussions: A Qualitative Study

Chairperson: Jingjing Sun, Ph.D.

Incorporating small-group discussions in classrooms has shown promising benefits in improving 4th grade students’ thinking and social skills; however, the practice remains challenging. Although teachers are motivated to try to incorporate small-group discussions, studies examining the shift from teacher-dominated classroom practice towards a more dialogic pedagogy are scarce. This study sought to explore the role of teacher group reflection on teacher’s learning to implement discussion-based teaching referred to as Collaborative Reasoning Discussion. Drawing from theories on reflective teaching and professional learning communities, seven transcripts of teacher reflections and 12 transcripts of facilitations were examined using line-by-line microanalysis and a linguistic ethnography analysis approach. Findings indicate that teacher group reflection served as a key role. Reflections not only provided opportunities to be aware of essential aspects and conflicts during implementation, but also offered strategies to deal with the conflicts. The results of the study provide deeper insights about the process of adopting a dialog-based pedagogy and the key role of group reflection in the process.
Dedication

This dissertation is dedicated to my family, friends, and colleagues with whom I found courage to begin and complete my doctoral studies.
Acknowledgement

A special thank you to my dissertation mentor, Jingjing Sun, Ph.D., thank you for introducing Collaborative Reasoning and being the person who continue to guide and encourage me throughout my doctoral studies. I am very fortunate to work with such a supportive mentor.

A big thank you goes for my Collaborative Reasoning Lab members, Sisilia Vena, Gregory Friedman, and Rebekah Skoog. Thank you for being an extension of my mentor where I could have an accountability team to share thoughts and many giggles with 😊.

To my other committee members: Dr. David Erickson, Dr. Dan Lee, Kate Brayko and Pablo Requena. Thank you for all of your constructive feedback to improve this dissertation.

To my previous colleagues at Defense Critical Language and Culture Program (DCLCP). Don Loranger, Shaima Khinjani, Faez Akram, and all the staff. I would not be here today without the scholarship from DCLCP. I was fortunate to have the financial support that I had and opportunities to build my teaching career.

To my mother Lusia Sartini, my father Sedya Wibawa, my brother Andreas Agra, and my sister Klara Kanya. Thank you for your prayers and uplifting video calls.

Last but not least to my dearest husband, Ian Miller. I cannot thank you enough for the emotional support especially for the last months leading to my dissertation defense. I thought completing this dissertation in a midst of a global pandemic was not possible, but you reassured me to keep going. Thank you for believing in me.
# Table of Contents

Acknowledgments v

CHAPTER 1. THE PROBLEM 1

Problem Statement 3

Statement of Purpose 4

Research Questions 5

Overview of Methodology 5

Qualitative Analysis 5

Rationale and Significance 6

Definition of Key Terminology 7

Organization of the Study 8

CHAPTER 2. LITERATURE REVIEW 10

Theoretical Framework 10

Synthesis of Research Literature and Methodological Literature 12

Dialog-Based Teaching: Trends and Challenges 12

Collaborative Reasoning: a pedagogical approach to group discussions 15

Teachers’ Role in Collaborative Reasoning 18

Reflective Approach Professional Development to improve Scaffolding 21

Linguistic Ethnography 25

Researcher’s positionality and voice 26

Summary and Conclusion 28
CHAPTER 3. METHODOLOGY

Rationale for research study design 30
Research setting and context 31
Research sample and data sources 31
Data Collection Methods 34
Data Analysis Methods 34
Issues of trustworthiness in qualitative analysis 40
Limitations and delimitations 41
Summary 41

CHAPTER 4. FINDINGS: TEACHER GROUP REFLECTIONS

Summary of Findings 43
Teachers’ Group Reflection 1 46
Teachers’ Group Reflection 2 48
Teachers’ Group Reflection 3 50
Teachers’ Group Reflection 5 54
Teachers’ Group Reflection 6 56
Teachers’ Group Reflection 7 59
Phases of Teachers’ Reflection 63
    Phase 1 64
    Phase 2 65
    Phase 3 66
Summary 67

CHAPTER 5. FINDINGS: TEACHER FACILITATIONS 68
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ Instructional Moves</td>
<td>69</td>
</tr>
<tr>
<td>Effectiveness of Teachers’ Instructional Moves</td>
<td>70</td>
</tr>
<tr>
<td>Ms. Anthony’s Facilitations</td>
<td>70</td>
</tr>
<tr>
<td>Ms. Janek’s Facilitations</td>
<td>81</td>
</tr>
<tr>
<td>Ms. Logan’s Facilitations</td>
<td>91</td>
</tr>
<tr>
<td>Summary of Teachers’ Facilitation</td>
<td>101</td>
</tr>
<tr>
<td>CHAPTER 6. DISCUSSION AND CONCLUSIONS</td>
<td>104</td>
</tr>
<tr>
<td>Summary of Findings</td>
<td>104</td>
</tr>
<tr>
<td>Discussion of Findings</td>
<td>105</td>
</tr>
<tr>
<td>Relationship between Teacher Reflection and Their Facilitations</td>
<td>111</td>
</tr>
<tr>
<td>Implications for Practice</td>
<td>112</td>
</tr>
<tr>
<td>Limitations and Future Research</td>
<td>113</td>
</tr>
<tr>
<td>Conclusion</td>
<td>114</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>115</td>
</tr>
<tr>
<td>APPENDIX A. CODING THEMES IN TEACHER REFLECTIONS</td>
<td>120</td>
</tr>
<tr>
<td>APPENDIX B. CODING THEMES IN TEACHER FACILITATIONS</td>
<td>121</td>
</tr>
</tbody>
</table>
CHAPTER 1
THE PROBLEM

In recent years, studies incorporating group discussions have shown promising benefits in increasing student participation and improving their thinking skills (Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009), yet teachers are still struggling to implement dialog-based instruction. Although teachers are generally supportive of this pedagogy and eager to try it (Sedova, Salamounova, & Svaricek, 2014), results are varied when examining the outcomes of professional development aimed at improving dialog-based teaching. For example, quantitative studies have shown promising results of professional development effectiveness to shift teachers practice towards a more dialogic pedagogy, however they lack larger samples and longitudinal data (Pol et al., 2018; Wilkinson, et al. , 2017). Another study lacks more detailed transformational change in shifting from teacher-centered to student-centered style, as well as teachers’ own perceptions of their experience (Sedova, 2017).

One of the proponents of dialog-based instruction is Alexander (2006) whose concept, Dialogic Teaching, inspires educators to incorporate principles, such as collective, reciprocal, supportive, cumulative, and purposeful discussions into their classrooms. However, when implemented in the class, some of these principles are in conflict with each other (Lefstein & Snell, 2014; Sedova et al., 2014). For example, when teachers create a supportive environment for dialog, they need to refrain from providing critical feedback; a discussion can only cumulate if reciprocity comes first.
Besides the issues with potentially conflicting principles, there are other constraints, such as curriculum and societal choices (Burbules, 1993; Lefstein & Snell, 2014). Commonly, school curriculums are evaluated through standardized testing; consequently, teachers are more concerned with strategies to help students pass the test than to focus on dialog-based instruction that could help children develop higher order thinking skills. More often than not, teachers must also deal with classroom management issues, especially when classroom size is large, which may leave discussion activities harder to regulate.

Despite all the challenges, however, helping teachers shift towards dialogic-based learning is still far more valuable than disregarding it. Incorporating more dialog in learning creates a classroom environment that mimics real life where people learn from socializing with each other (Bakhtin, 1970; Vygotsky, 1978). Furthermore, it teaches students a “spirit of equality, mutuality, and cooperation” (Burbules, 1993, p. 143).

One of the dialogic teaching approaches is Collaborative Reasoning. Collaborative Reasoning emphasizes utilizing small-group discussions to talk about issues that are relevant to learners’ interest, such as moral and societal dilemmas (Anderson, et al., 1998; Waggoner et al., 1995). Prior to implementing Collaborative Reasoning discussion, teachers are informed about its central elements, such as the argument house (positions, reasons, evidence, challenges/counterarguments, responses to challenges, and evaluation/consideration) and instructional moves (modeling, thinking out loud, prompting, clarifying, challenging, reminding, summarizing and refocusing, encouraging, fostering independence, and debriefing) in order to facilitate discussions (Jadallah et al., 2010; Nguyen-Jahiel et al., 2007; Reading Research Center, 2011).
There are many benefits of incorporating CR discussions into classroom learning, such as fostering communicative competence and causal reasoning (Ma et al., 2017), promoting emergent leadership through open participation (Li et al., 2007; Sun et al., 2017), higher rates of conceptual growth when reading to prepare for argumentative discussion (Miller et al., 2014), and better use of reasoned arguments that naturally intensify and spread among group members (Anderson et al., 2001). Despite any of the benefits, empirical studies that examine support for teachers’ continued practice of CR are scarce (Reznitskaya et al., 2009).

This dissertation analyzed archived transcripts of data about elementary school teachers implementing Collaborative Reasoning Discussions in their language art classes. Results of analysis may add insights to the empirical studies mentioned above, which are intended to inform and support instruction using student-centered discussion. Utilizing data collected from a recent study conducted in Montana, I examined transcripts of teachers’ group reflections and their discussion facilitations. The final goal was to shed light on the role of group reflections in how teachers learn to implement dialog-based teaching in a classroom setting.

Problem Statement

Despite the growing support to encourage dialog-based teaching, teachers lack instrumental support and current information to sustain their practice (Reznitskaya et al., 2009). Idealized principles to guide teachers, such as collective, reciprocal, supportive, cumulative, and purposeful, are difficult to implement in reality (Alexander, 2006). Without sufficient appropriate support relevant to their contexts, teachers’ motivation to encourage dialogue in a classroom will likely decrease.
Statement of Purpose

The purpose of this study was to investigate elementary school teachers’ group reflections regarding implementing Collaborative Reasoning Discussions in their language art classes. By examining archived transcripts of data, the study sought to contribute to current pedagogical knowledge that aimed at supporting teachers implementing small group discussions in their classrooms. This study attempted to understand teachers’ learning journey through analysis of teachers’ group reflections during the six-month study, followed by the analysis of samples of teachers’ actual small group discussion facilitations in their respective classes. Examining both reflection sessions and samples of discussion facilitation, this study provided insights about teachers’ learning journey through structured peer-sharing while practicing the new method of Collaborative Reasoning discussion.

Research Questions

Examining archived transcripts of data about elementary school teachers implementing Collaborative Reasoning Discussions in their language art classes, the overarching research question of the study is: What is the role of group reflections on teachers’ learning of implementing Collaborative Reasoning?

In answering the central research question, the following were the guiding sub-questions followed by detailed analysis steps in order to answer each question:

1. During teachers’ group reflections, what themes emerged?
2. How did teachers facilitate CR discussions?
3. What is the impact of teachers’ group reflections on their actual behavior during CR discussions?
Overview of Methodology

A single instrumental case study research design framed the study (Creswell & Poth, 2018). In this type of study, the researcher determines a focus to an issue and selects a bounded case that represents the issue (Creswell & Poth, 2018). A single instrumental case study research design was appropriate for this study because the framework fits to the type of data collected. It was also appropriate to address the research questions in providing rich opportunities in observing changes in scaffolding provided by the researchers to the teachers and examining whether and how teachers transferred the researchers’ scaffolding.

Data analyzed in this dissertation were collected from a six-month study where teachers and their students from three fourth-grade classrooms in a local Missoula elementary school participated in a series of eight Collaborative Reasoning discussions. More specifically, 12 small group discussions in total.

Data collection methods followed the ethical guidelines from the University of Montana Institutional Review Board (IRB). Prior to giving access to data for the present study, all personal identifying information was changed and available only with pseudonyms. All archived data were then stored in a password protected computer. University of Montana approved the study proposal (IRB protocol No: 53-19) under the Exempt category and the researcher would notify the IRB if there were any changes to the originally approved protocol.

Qualitative Analysis

Data were subjected to a qualitative analysis following a method by Sedova (2017) in her case study examining dialogic teaching as a process of gradual change, as
well as Copland and Creese (2015) in a case study investigating feedback conferences in pre-service teacher preparation. Both studies adopt linguistic ethnography that allows line-by-line microanalysis to identify changes. Defined as “an interpretive approach which studies the local and immediate actions of actors from their point of view and considers how these interactions are embedded in wider social context and structures” (Copland & Creese, 2015, p. 13), linguistic ethnography approach to analysis is commonly used in interactional data, such as data from classroom discussions and teachers’ group reflections.

Multiple stages of analysis were employed following Copland and Creese’s (2015) data investigation method. There were three stages of analysis following the sequence of the three sub-research questions. First analysis consisted of examining teachers’ group reflection transcripts. Next, teachers’ discussion facilitation transcripts and videos were scrutinized to determine the types of instructional moves and their effectiveness. Finally, integrated analysis, comparison between the analysis results from teachers’ group reflections before and after the discussions and their actual discussion facilitations, was completed in order to rationalize the impact of group reflections on the successful implementation of Collaborative Reasoning discussions.

**Rationale and Significance**

Without support that is relevant to teachers’ teaching contexts, motivation to incorporate dialogue in a classroom will likely to decrease. This study thus contributed its findings to support teachers through dialogue teaching by answering the central research question of how scaffolding for teachers changes as they learn to adopt a dialog-based teaching, Collaborative Reasoning discussion. The results of the study will directly
benefit local teachers who teach in similar school and classroom setting with similar student demographic. The study will also benefit wider audiences when disseminated through conference presentations and publications.

**Definition of Key Terminology**

_Collaborative reasoning discussion_ is “an educational approach that places dialogic inquiry at the center of its pedagogy” (Reznitskaya et al., 2009, p. 33).

Typically, in the United States, students in Grades 4 and 5 are the participants. First, they read texts containing moral and societal dilemmas and then, engaged in small-group discussions (Anderson et al., 1998; Waggoner et al., 1995).

_Dialogic teaching_ centers in the use of spoken language in teaching that would enable students to be active participants in learning process (Alexander, 2006).

_Principles of dialogic teaching_, according to Alexander (2006) are collective, reciprocal, supportive, cumulative, and purposeful.

_Scaffolding_ in learning is a structure, specifically mounted to assist learning temporarily, as well as a process, which can be a series of different activities conducted over time, until learners can perform a task at ease on their own (Pea, 2004).

_Teachers’ scaffolding/instructional moves during small-group discussion facilitations_ in the present study follows Collaborative Reasoning instructional moves that consist of modeling and thinking out loud, prompting, clarifying, challenging, reminding, summarizing and refocusing, encouraging, fostering independence, and debriefing. (Anderson et al., 1998; Reading Research Center, 2011;
Scaffolding from researchers during teachers’ group reflections in the present study applies to structures in a form of materials and activities designed to support teachers’ learning as they adopt Collaborative Reasoning discussion.

Organization of the Study

The dissertation report was organized as follows. In Chapter 2, the literature review began with discussing current trends and challenges of dialog-based teaching. Then, Collaborative Reasoning as a pedagogical approach to group discussion was discussed followed by the teachers’ role in implementing this method. Next, discussion on relevant studies of professional development aimed at improving teachers’ discussion facilitation was reviewed including literature on teachers’ reflection. Finally, the linguistic ethnography interpretive approach was discussed to justify analysis of findings.

Chapter 3 described the rationale for the research study design, followed by illustrating the research context, research sample, and data sources. Data collection methods followed ethical considerations from the Institutional Review Board, and stages of data analysis using linguistic ethnography were explained. The final part of Chapter 3 discussed issues of trustworthiness as well as limitations and delimitations.

Chapter 4 and Chapter 5 discussed findings of teacher reflection and teacher facilitation. Chapter 4 summarized themes that emerged during facilitation sessions. The chapter concluded with a summary of the three phases teachers went through based on their reflections. Chapter 5 summarized types of facilitation teachers utilized during facilitations and descriptions of each teachers’ facilitation trends. Chapter 5 concluded with a summary of each teacher facilitation.
Chapter 6 discussed further findings of both preceding chapters in order to answer the main question: What is the role of group reflections on teachers’ learning of implementing Collaborative Reasoning? Three main points are elaborated: (a) the complex process of adopting a more dialogic pedagogy, (b) teacher appropriation of the new method based on their current teaching practice, and (c) the central role of teacher reflection as a place to be aware of essential aspects of discussion, notice issues during implementation, and find strategies to resolve the issues. The chapter concluded with a description of limitations of the study and potential future research studies.
CHAPTER 2  
LITERATURE REVIEW

This chapter situates the study in the context of previous empirical research and scholarly materials pertaining dialog-based teaching using small-group discussions and professional development for teachers who learn to incorporate it. The chapter also aims to present a theoretical framework and a synthesis of previous research to justify how this study adds to the body of literature. Finally, it provides theoretical and methodological bases for the study and the analysis.

In order to answer the research question of the role of group reflection on elementary school teachers’ learning of implementing Collaborative Reasoning discussion in their language art classes, a broader discussion on trends and challenges of dialogic-based teaching will be presented. Next, research and findings on Collaborative Reasoning Discussion, as one of dialogic-based teaching pedagogical methods implemented during intervention study, will be elaborated. Subsequently, critical to the teachers’ role during Collaborative Reasoning Discussion is synthesis of theory of scaffolding and empirical studies on professional development that aims at supporting teachers’ practice. At the end of the chapter, interpretive approach of linguistic ethnography will be discussed as the basis for analysis as well as researcher’s positionality.

Theoretical Framework

The theoretical framework used to guide this study was qualitative in nature. Examining transcripts of teachers’ group reflection of their Collaborative Reasoning
discussion facilitations, this study adopts social constructivism interpretive framework (Creswell & Poth, 2018) and sociocultural learning theories as proposed by Vygotsky (1978) and Rogoff (1990). Analysis that utilizes social constructivism interpretive framework relies on participants’ views of their experience using primarily general questions to prompt participants’ meaning making of their lived experience, therefore, inductively generate themes emerged (Creswell & Poth, 2018, p. 24). Interpreting participants’ experience, the researcher acknowledges her own background, such as personal, cultural, and professional experiences that may shape interpretation of the data (p. 24). This recognition of researcher’s positionality is discussed at the end of this chapter.

Vygotsky’s sociocultural learning theory emphasizes Zone of Proximal Development. The concept centers on a condition which enables maximum learning ability: where a task is neither too easy nor too difficult to accomplish. As such teacher’s role is important to design learning within the Zone of Proximal Development. Rogoff (1998) extends Vygotsky’s Zone of Proximal Development through her theory of Cognitive Apprenticeships. Cognitive Apprenticeships centers on the idea that learners learn best through doing the task in collaboration with knowledgeable others, such as teachers or mentors. Through “guided participation” which is gradually reduced until learners can do the task independently, Cognitive Apprenticeships encourages “active learning” and promote minimal use of explicit teaching.

Teachers’ learning to implement Collaborative Reasoning discussions with the support of semi-structured group reflections is strongly influenced by sociocultural learning theory. In this study, teachers attempt to acquire a new set of skills and
understanding in collaboration with their peers and a knowledgeable mentor. The “active learning” component are particularly emphasized through cycles of small-group facilitations that were directly followed up with group reflections. While facilitations are opportunities to implement the new skill set, reflections are essential periods where teachers evaluate learning, are made aware of their challenges and progress to improve their understanding and practice.

The sociocultural learning theory proposes that learning is best achieved through collaboration with others. Therefore, group reflections play a key role. Reflection sections not only can serve as a platform for teacher to share experiences with their peers but can also be utilized as a form of intervention by mentors. For example, teachers are given specific task that allows them to be uncover new understanding, be critical of their practice, and find strategies to overcome challenges. Theories on reflective teaching is discussed on the following section.

**Synthesis of Research Literature and Methodological Literature**

**Dialog-Based Teaching: Trends and Challenges**

Based on Vygotsky’s (1978) socio-cultural theory and Bakhtin’s dialogism (1970), dialog-based teaching centers in the use of spoken language in teaching that would enable students to be active participants in learning process (Alexander, 2006). Contrary to teacher-presentation mode, in dialog-based teaching, ongoing talk between teacher and students is encouraged, such as using small-group discussions to explain each other’s ideas. Although dialog-based teaching has been widely promoted as an effective way to teach in educational sciences, its implementation remains challenging for teachers.
(Burbules, 1993; Lefstein & Snell 2014; Sedova, Salamounova, & Svaricek, 2014; Reznitskaya et al., 2009).

Alexander (2006) popularizes dialog-based teaching through his book on dialogic teaching where central elements to dialogic teaching are introduced such as indicators, principles, and methods. While the element of indicators looks at performance in class that indicate the existence of dialogic teaching and principles provides guidance for teachers to employ dialogic teaching, the element of methods concerns of how to accomplish the goal Alexander (2006). Observable indicators include key indicators when examining teachers’ dialogic teaching videos, such as whether students raise questions and expressing reasoned arguments, whether teachers prompt students with questions that elicit higher-order thinking, and whether the discussions show talking that builds on each other with multiple participants contribute in length (Alexander, 2006).

Indicators present evidence of dialogic teaching as it is conducted in the classroom, but only with guiding principles teachers can learn how to do so (Alexander, 2006). Key guiding principles proposed by Alexander (2006) include collectivity, reciprocity, support, cumulation, and purpose. Collectivity means that teachers should create tasks that encourage all students to participate. Reciprocity refers to establishing a supporting learning environment where teachers and students can express their thoughts considering alternate perspectives with respect. Support means that students are not forced or afraid to participate. Cumulation and purpose are closely related to the content and goal of the educational tasks. Cumulation specifies as productive speaking turns that progressively reach purpose of a lesson. Similarly, purpose refers to reaching the goal of the lesson after a series of cumulative turn-taking.
Teachers need to ensure that while students have supports to share thoughts and other viewpoints collectively and reciprocally, the interactions should be geared towards building new skills and knowledge that are in line with specific educational goals. In reality, these principles are very difficult to attain. Teachers are often struggling to teach with the idealized principles simultaneously (Lefstein & Snell, 2014; Sedova, Salamounova, & Svaricek, 2014). Excerpts from teachers’ interview and classroom discussion in Czech Republic classrooms show that despite teachers’ enthusiasm about supporting the goal of the method and strong will to implement it in the class, teachers experience challenges (Sedova et al., 2014, p. 282). On the one hand, one principle can only be attained after another occurs, such as reciprocity should come first to achieve the cumulative. One the other side, two principles contradicts with each other. For example, when teacher shows support to ease participation from students, teacher may need to suppress the purpose of the lesson which requires critical commentary.

Burbules (1993) and Lefstein and Snell (2014) discuss other constraints that contribute to failed attempts to teaching through dialogue in classroom, such as curriculum constraint and societal choices. Most curriculum demands learning evaluations through standardized testing that forces classroom instructions to be test-driven. Additionally, teachers normally teaches 30 to 40 students in a class, which makes facilitating small-group discussions even more difficult to manage. Teachers are left with divided focus between keeping small-groups running and ensuring the rest of the class are also on learning tasks.

Although such challenges with actual classroom implementation remain inherent, they “should not lead us to abandon this method, if only because potentially it can create
classroom experiences that are authentic, inclusive, and rational” (Reznitskaya et al., 2009, p. 30). Indeed, teachers are faced in complexity, inconsistency, and uncertainties; however, teachers also choose to engage in dialogic approach because of the “spirit of equality, mutuality, and cooperation” (Burbules, 1993, p. 143) that it fundamentally aspires to achieve.

Incorporating dialog into classroom settings can be achieved through several pedagogical methods such as using Book Club, Philosophy for Children, Paideia Seminar, Instructional Conversation, Junior Great Books Shared Inquiry, and Collaborative Reasoning (Murphy et al., 2009). A meta-analysis of empirical studies was conducted to investigate the effects of classroom discussion on measures of teacher and student talk and on individual student comprehension and critical-thinking and reasoning outcomes (Murphy et al., 2009). Collaborative Reasoning discussion were particularly effective in promoting critical thinking, reasoning, and argumentation in both multiple-group design studies and single-group design studies, increasing students’ talk by almost 4 standard deviation and decreasing teachers’ talk by approximately 2 standard deviation (Murphy et al., 2009).

The following sections are dedicated to reviewing Collaborative Reasoning Discussion. The first part is discussion of its procedures and followed by teacher’s role. The next part is the discussion of literatures relevant to professional development activities that aim to support teachers in incorporating discussion-based classroom.

**Collaborative Reasoning: a pedagogical approach to group discussions**

Collaborative Reasoning is “an educational approach that places dialogic inquiry at the center of its pedagogy” (Reznitskaya et al., 2009, p. 33). Based on Vygotsky’s
(1986) social constructivism, this approach believes that learning is internalized through socialization. The more learners have the opportunity to interact with others, the more they will develop their thinking skill.

Collaborative Reasoning was developed by the researchers from the Center for the Study of Reading at the University of Illinois at Urbana-Champaign. Students in Grades 4 and 5 read texts contain moral and societal dilemmas and then engage in small-group discussions (Anderson et al., 1998; Waggoner et al., 1995). The goal of the activity is for students to exercise both their argumentation skill, such as by supporting their positions with reasons and evidences, respecting others when they are talking and evaluating others’ reasoning and thinking of the issues from multiple perspectives and their social skills. Texts that are used in the small-group discussion are chosen so that students can relate to and are interested in talking about, such stories containing dilemma when dealing with friendship, safety, honesty, animal rights, and obligations.

![Figure 1. Procedures of Collaborative Reasoning Discussion (the Reading Research Center, 2011)](image)

As shown in Figure 1, the big question is at the center of the discussion. For example, reading a story about *Amy’s Goose*, students respond to the big question of
should Amy let the Goose free after taking care of its wound. The dilemma presented is wanting to have the goose as her pet or letting the goose free. Students are then to engage in a discussion that will allow them to practice using argument house that consist of positions, reasons, evidence, counterarguments, responses to challenges, and evaluation/ consideration. Teachers, as part of the discussion, support students through instructional moves such as modeling and thinking out loud, prompting, clarifying, challenging, reminding, summarizing and refocusing, encouraging, fostering independence, and debriefing (Jadallah et al., 2011).

Studies shows potential benefits from participating in Collaborative Reasoning discussions; such as fostering communicative competence and causal reasoning (Ma et al., 2017), promoting emergent leadership through the Collaborative Reasoning feature of open participation (Sun et al., 2017; Li et al., 2007), higher rates of conceptual growth when reading to prepare for argumentative discussion (Miller et al., 2014), and better use of reasoned argument that are then naturally intensify spread among group members (Anderson et al., 2001).

With the promising benefits of Collaborative Reasoning discussion, teachers’ role is critical to provide necessary scaffolding. As mentioned in the results of metacognitive study by Murphy et al. (2009), significant learning will not happen simply by placing students into small groups and encourage them to talk; teachers should be mindful of the goal of using the approach while also letting students to have the floor to some extend (p. 761).

Yet, providing such environment in discussion-based teaching is a complex and challenging process with limited empirical studies to support (Burbules, 1993; Lefstein &
Snell 2014; Sedova et al., 2014; Reznitskaya et al., 2009). For one, supporting teachers although generally found effective, its long-term effects are unknown due to the time-restrictive nature of professional development activities (Sedova, 2016). Time restriction also may result in teachers’ inability to examine and internalize the newly learned approach on their own. Changing to a discussion facilitator can as well be burdensome for teachers who are more comfortable with IRE teaching style and believe of its effectiveness.

Despite its challenges, providing teachers with effective support to facilitate discussion-based teaching is extremely valuable. Not only because students have gained benefits from approach, such as Collaborative Reasoning discussion, but also teaching teachers to be an effective facilitator will prolong the effects. The next section will discuss further teachers’ role during small-group discussions and reflective approach to professional development, one of the ways to support teachers with applicable tools and let practice the tools at the same time.

**Teachers’ Role in Collaborative Reasoning**

Scaffolding is a form of support, mounted to learners until they are able to perform independently (Pea, 2004). Linguistically, it is a noun, a structure, specifically mounted to assist temporarily, and also a verb, a process, a series of different activities conducted over time, until learners can perform a task at ease on their own (Pea, 2004). Aligned with Vygotsky’s Zone of Proximal Development, i.e. “the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Crain, 2005, p. 86), scaffolding help students to
be in a growth state where tasks are neither too difficult nor too easy (Figure 2).

Csikszentmihalyi (1997) on his theory of flow suggested that the maximum condition to learning is finding appropriate balance of task challenge, language, and cognitive skills in order to advance learning.

![Diagram showing the relationship between task challenge, skills, and learning](image)

*Figure 2. Csikszentmihalyi (1997)*

Teachers’ role can be characterized as someone who provide scaffoldings through nine pedagogical strategies/ instructional moves such as modeling and thinking out loud, prompting, clarifying, challenging, reminding, summarizing and refocusing, encouraging, fostering independence, and debriefing (Reading Research Center, 2011; Anderson, Chinn, Waggoner, & Nguyen-Jahiel, 1998). These instructional moves are purposeful in order to motivate students not only to participate, but to improve the quality of their participation and adaptive suggesting that teachers choose which moves relevant to each group discussion’s need (Reading Research Center, 2011).

Following the definitions from the Reading Research Center (2011), “prompting” refers to opening the floor for discussion through asking students’ positions and their justifications for the position. Teachers may ask “students to state their positions, reasons, evidence, alternative viewpoints, and/or evaluation” (p. 22); “thinking out loud”
refers to “describing what is going on inside your mind as you work through the thinking process” where teachers model an example of reasoning processes (p. 23); “asking for clarification” means “asking students to be clear in their argumentation” (p. 25); “challenging” means teachers challenge students “to consider alternative points of view… also challenge the connections that they (students) are making in their arguments” (p. 26); “step in and remind” means when teachers explicitly invite students when they are off from the ground rules and norms for the discussion (p. 27); “encouraging” is “acknowledging and praising students for progress in reasoning and participation skills.” (p. 28); “fostering Independence” is teachers’ “moves that support the gradual transfer of responsibility for maintaining the flow of the discussion to the students” (p. 29); “summing up & re-focusing” is a way to keep track of discussion by periodically “sum up what students have said and help the group re-focus… also have students evaluate arguments that have been posed” (p. 30); and “debriefing” means “a metadiscussion on the quality of the reasoning and participation dynamics in the group” (Reading Research Center, 2011, p. 31).

For teachers, an intrinsic component of scaffolding in teaching is gradual decrease of the scaffold where teachers moderately reduce participation to let learners achieve the desired outcome unassisted (Waggoner et al., 1995). This fading concept coupled with instructional moves to assist discussion, in reality, is complex and problematic for teachers. Teachers are still used to the prevalence of Initiative-Response-Evaluate class interaction (Webb et al., 2015). As a result, guiding students to ultimately be able managing their own group discussion flow is quite challenging for teachers to master (Waggoner et al., 1995).
Teachers’ role as knowledgeable partners in discussion is indeed vital to learning progress, yet the role possess a problematic practice. For example, it asks teachers to be discussion partners, yet they are also still authoritative figures in the classroom. However, as Burbules (1993) and Reznitskaya et al. (2009) express, although egalitarian is an essential characteristic in discussion-based teaching, it still values the authority of teachers as someone with more expertise and experience who can help to boost the promising benefit of discussion-based teaching. With that in mind, it affirms that effective professional development is imperative. The following section will discuss about professional development that incorporates reflective activities among teachers.

**Reflective Approach Professional Development to improve Scaffolding**

Reflective teaching can be defined as “active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends” (Dewey, 1933, p. 9). He characterized the reflective process in two senses: first, a state of uncertainty and mental difficulties; and second, an act of inquiring to resolve the former (p. 12). The following studies integrated reflective activities for teachers’ learning to implement Collaborative Reasoning discussion indicated some degree of success with a number of areas that are still challenging for teachers (Chinn, Anderson, & Waggoner, 2001; Osborne et al., 2013; Pehmer, Groschner, & Seidel, 2015; Pimentel & McNeill, 2013; Sedova, 2016; Sedova, 2017; Wells & Arauz, 2006).

Chinn et al. (2001) reported, an intervention study aiming at increasing learners’ talk were successful when compared to recitation mode of teaching; however, teachers reflected that they found it challenging to transfer control over topic and turn-taking to
students versus transfer interpretation of texts to students (p. 407).

In another study comparing quantitative and qualitative findings, teacher’s reflection analysis shows increased motivation in adopting dialogic way of teaching, yet in practice Initiate-Response-Evaluation mode still more frequently occurs (Wells & Arauz, 2006). Similar to the results of Chinn et al.’s (2001) study, Wells and Arauz’s (2006) quantitative analysis on teachers’ participating in an inquiry-based teaching training found that although shifting indicators towards a more dialogic teaching were noticeable, recitation mode of teaching is still shown to be pervasive. The quantitative results showed minimal change, but analysis of teachers’ reflection found gradual increase of teacher’s effort to adopt ‘dialogic stance’.

Pehmer and colleagues (2015) conducted a study implementing video-based teacher professional development program, i.e., using teachers’ actual classroom videos as a point of reflection. One of the purposes of the study was to facilitate a change from teaching emphasis use of Initiate-Response-Evaluation mode to teach that foster and scaffold productive student engagement (Pehmer, Groschner, & Seidel, 2015). Examining three key elements, such as teacher questions, student answers, and teacher feedback, the study found that video-based professional development supported teachers in making more productive feedback; however, no significant changes in teacher questions and student answers when compared to traditional professional development program (p. 25).

As exemplified above, to pinpoint an effective way to help teachers is a not easy. However, one study is particularly interesting as it detailed a teacher’s shift to discussion mode of teaching as follows. Sedova (2017) conducted a case study portraying a
successful journey of a teacher’s gradual change, who was able to show better progress compared to other teachers, in shifting from the typical emphasis of Initiate-Response-Evaluation to a more open discussion mode to teaching. Prior to the qualitative study, an action research was conducted (Sedova, 2016). It aimed at examining whether “the teacher development program lead to a change in the nature of student talk” (p. 17) and “which teacher indicators influenced the character of student talk” (p. 17).

A one-year professional development was conducted to train teacher using dialogic teaching to lower secondary school students with eight teachers participated in four workshops throughout the year. During the year, teachers’ classes were videotaped for the purpose of video-based reflections. Quantitative analysis of videos before and after the teacher development program showed a change in classroom discourse with a significant change in students’ talk. Besides rise of students’ participation, teacher’s use of open discussion showed more influence in increasing students’ talk, where teacher built on based on students’ responses.

Based on the quantitative analysis (Sedova, 2016), a case study on one teacher was developed to examine closely why she was able to implement it successfully (Sedova, 2017). Results of the qualitative analysis found that her success was especially identified when she went through three stages of implementation where she overcame various challenges (p. 235). The first stage was when she has used a technique in conjunction to her habitual IRE (teacher Initiates - student Responds – teacher Evaluates) mode (p. 232). The technique was using interrogative words so students able to interpret the text; however, she never thought of questioning technique to foster open discussion. The second stage was when she faced dilemma because she was not able to achieve her
lesson’s goal (interpreting the text) through open discussion. She expressed that she had to choose whether to interpret the text, which normally achieved through Initiate-Response-Evaluation or to employ technique for open discussion, which was introduced by researcher. As she chose the former, the lesson returns to Initiate-Response-Evaluation mode (p. 233). Finally, the third stage was after she and the researcher found ways where she would be able to meet the lesson goal while implementing open discussion. The teacher, then, modified the way to ask questions, such as eliminating what and where, and she may take part in the talk only when needed (p. 234). During the third stage, the teacher managed to balance communication, creating more space for students’ initiating questions and talking while still allowing her take part when needed (p. 235).

Sedova’s study highlights changes in scaffolding from researcher to teacher and then teacher to students as both the researcher and the teacher try to improve students’ participation in discussion while ensure that the teaching is in line with lesson’s goal. It also features the role of researchers as partners in learning that situates process of shifting from Initiate-Response-Evaluation to open discussion in accordance with teacher’s own goal to deliver the subject. This contextual practice of supporting teachers resonates with Lefstein & Snell’s (2014) situated dialogic teaching. The term “situated” means that dialogic teaching takes account for circumstances that put constraint to teachers initially; and in the end, it is able to integrate with what the teachers essentially need.

The present study aimed to capture teachers’ learning journey as they gradually shifted to incorporating more dialogue via small-group discussions. As successfully completed in Sedova’s (2017) study, an interpretive approach of data analysis allowed
the researcher to unravel a teacher’s stages of change. The present study thus utilized an interpretive approach of linguistic ethnography which will be further explain below.

**Linguistic Ethnography**

Linguistic ethnography is “an interpretive approach which studies the local and immediate actions of actors from their point of view and considers how these interactions are embedded in wider social context and structures” (Copland & Creese, 2015, p. 13). The approach requires researcher to examine how people who are bounded to a system or an institution socially engage. On the surface, the interaction seems very common, yet it contains underlying questions about day-to-day conversation that when being examined through combination of language and cultural practices, we may find a new appreciation. As Copland and Creese (2015, p. 13) assert “to make the familiar strange, we need the interpretive approaches of linguistic ethnographers because the institutions we know best, the routines we practice most, and the interactions we repeatedly engage are so familiar that we no longer pay attention to them.” Interactional data are, then, an ideal source of evidence for study using linguistic ethnography approach. The data can be in a form of public or private. Public data can be found where talk takes place for both listeners and speakers, such as in classroom settings or business meeting while private data can be found where talk is exclusively for those involved in conversations, such as students’ or teachers’ talk during break time (Copland & Creese, 2015).

Sedova’s (2017) case study in examining a teacher’s gradual change followed linguistic ethnography when conducting qualitative analysis on an individual teacher’s reflective interviews. She utilized interactional data, such as video recording of class discussion and teacher’s reflective interviews. She searched for indicators of dialogic
teaching in the group discussion videos. Next, she subjected the data to line-by-line microanalysis when investigating reflective conversations between a researcher and a teacher allowing her to identify the process of change that comprises struggles and how to cope with the struggles.

In another case study employing linguistic ethnography approach, Copland and Creese (2015) conducted a Conversation Analysis in researching feedback conferences in pre-service teacher education. She recorded and transcribed sessions of peer-feedback where pre-service teachers give feedback to each other’s lessons. Conversation Analysis starts by looking at the interactions closely at each speaking turn and making connections of what has been said before and what has been said after. To implement the analysis, transcriptions must include pause, interruption, and interactional feedback “because the construction of talk provides as much information about meaning and context as its content” (Copland & Creese, 2015, p. 15).

**Researcher’s positionality and voice**

Researcher’s positionality is related to the “role and relationships… how the self is performed and perceived” (Copland & Creese, 2015, p. 95) during field work whereas researcher’s voice is concerned with “biases, ideas, emotions and feelings to the research” (p. 97). Copland and Creese (2015) suggested that since a researcher is a part of the study, researcher should be informed and aware of how researcher’s positionality and voice shape how the study is conducted and understanding of the analysis performed afterwards. Indeed, both are inevitable and often be problematized, yet qualitative study such as using ethnography, are far from presenting research in neutrality (Taylor, 2002).
Peshkin (1988) further states that researchers develop subjectivities throughout their fieldwork which may influence aspects of the research and how results are written.

In this study, the researcher’s positionality and voice changed during the data collection stage to the data analysis stage. During the data collection stage, the researcher was a somewhat distance observer. While the Principal Investigator was also a mentor to the teachers, the researcher was primarily an assistant. This rather distance role provided the researcher with opportunities to fully observe how the research was conducted.

During the data analysis and writing the results stage, the researcher’s subjectivity became apparent. The researcher was a foreigner with some knowledge of United States School system. Majority of the researcher’s familiarity with US education has been through coursework and training as a doctoral student. However, the researcher also shared several aspects of the teachers’ lived experience during the study. As a language teacher, the researcher could relate to the struggle and successes the teachers experienced as well as appreciate support from the research team. These shared experiences were apparent particularly when examining closely teachers’ reflections and their sample of facilitations’ transcript, but never explicitly written until the writing of results completed.

Reflecting back to before the study was conducted, the researcher was intrigued by Collaborative Reasoning method. The researcher grew up with an education system where lecturing was still dominant. Dialogic approach was introduced only at universities, even then, it was a dialogic approach in superficial manner, such as utilizing small-group discussions to discuss closed-ended questions instead of higher-order questions that exercise critical thinking skills. Lacking critical thinking skills aspect during early years of education caused challenges for the researcher as a doctoral student.
and a teacher. Understanding its importance for teaching and learning, the concept is promising, yet challenging to apply. The researcher’s personal goal as a teacher and learner was to be able to incorporate dialogic approach practice in her own teaching and learning.

**Summary and Conclusion**

Although there is an increasing call for fostering dialog in classrooms, limited empirical studies exist to help teachers cope with complexities and struggles in shifting to a more dialog-based teaching. Several studies identified positive ways that will effectively facilitate teachers’ change by observing closely teachers’ individual reflection and then comparing it to their discussion’s facilitation, such as through video-based professional development program. By incorporating the interpretive approach of linguistic ethnography, this dissertation study investigated the following central research questions:

*What is the role of group reflections on elementary school teachers’ learning of implementing Collaborative Reasoning in their language art classes?*

To answer the central research question, archived transcripts of teachers’ group reflections and samples of their facilitations were examined. In particular, the following questions were addressed:

1. During teachers’ group reflections, what themes emerged?
2. How did teachers facilitate CR discussions?
3. What is the impact of teachers’ group reflections on their actual behavior during CR discussions?
CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate elementary school teachers’ group reflections regarding implementing Collaborative Reasoning Discussions in their language art classes. A single instrumental case study research design framed the study (Creswell & Poth, 2018). Transcripts of reflections and discussion facilitations of three upper elementary classes were examined. The analysis elaborated teachers’ learning trajectory when adopting a dialogic teaching method of Collaborative Reasoning discussion.

In order to examine a gradual change, a qualitative analysis using Nvivo 12 was conducted following stages of analysis by Copland and Creese (2015) and Sedova (2017). Both were case studies of teachers’ learning process using interpretive approach of linguistic ethnography through three stages of analysis. In the initial analysis, field notes were examined, and then interactional data of teachers’ group debriefing to categorize type of talks and their purposes were examined through line-by-line analysis of the transcripts. During the second stage of integrated analysis, analysis from the field notes and interactional data were combined and the results were cross-referenced to relevant theoretical literatures. Finally, microanalysis was employed to study sections of selected interactional data.

Line-by-line microanalysis in Lefstenin & Snell (2014) is analysis of real-life data extracted from classroom interaction that allows dialogic teaching educators to reflect on the complexities of classroom discussions and imperfections of the process. Lefstein and
Snell (2014) believe that dialogic teaching should not be perceived as “best practice” to be adopted as procedures. Instead, dialogic teaching should allow teachers to mutually share data and experience to be able “to develop abilities to observe, interpret, and discuss pedagogical phenomena” (Sedova, 2014, p. 186). Drawing from corpus of data, such as video recording of lessons, recording of teachers’ workshop, and teachers’ reflective interviews, Lefstein and Snell suggest that a method that is successful in one setting may not be as successful when implemented in another setting.

Sedova (2017) used linguistic ethnography and line-by-line micro-analysis for detailed analysis of the interaction between students in small-group discussion and a teacher in a given context. The analysis steps are as follows. First, examining indicators of dialogic teaching in small-group discussion. Second, analyzing one teacher’s individual reflective interviews to search for which topics of indicators appeared and which characteristics of a lesson triggers a change. Third, comparing data from the teacher’s reflection and small-group discussion facilitation to see correspondence between the two data. Through the analysis, however, the size of the group and whether the analysis is based on the same group being monitored throughout the study were unknown.

**Rationale for research study design**

A case study research can be defined as “a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded system (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g. observations, interviews, audiovisual material, and documents and reports), and reports a case description and case themes” (Creswell &
The present study analysis was categorized as a single instrumental case study design. Case study design allows the researcher to examine single or multiple cases in a bounded system using a variety of data sources (Creswell & Poth, 2018; Yin, 2014).

A single instrumental case study as defined by Stake (1995) is having “a research question, a puzzlement, a need for general understanding, and feel that we may get insight into the question by studying a particular case” (p. 3). In this type of case study, the researcher determines a focus to an issue and select a bounded case that represent the issue (Creswell & Poth, 2018). Single instrumental case study was more appropriate for the study because the framework fits to the type of data available and applicable to the purpose of the study in observing changes in teachers’ learning.

**Research setting and context**

The setting of the study was at three fourth-grade classes in a local Missoula’s elementary school. Based on the Common Core Standards, one of the priority standards of speaking and listening for fourth grade English Language Arts is “Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others’ ideas and expressing their own clearly” (Common Core State Standards Initiative). Teachers were interested in participating in this study because of the potential benefit of the study that clearly supports the academic standards.

**Research sample and data sources**
Figure 1 and Figure 2 compare the data collected during the intervention study and the data utilized for the dissertation study. The study included all teachers’ group reflections and a small sample of teachers’ small-group discussion facilitations.

Figure 1. Teacher facilitations and reflections data sets from the entire six-month study
Following Creswell and Poth (2018), sampling in this study categorized data as homogenous, stratified purposeful, and convenience (Creswell & Poth, 2018, p. 159).
Three upper elementary school teachers along with a total of 18 students were chosen for analysis out of 76 students who participated in the original study. Detailed information of the participants is presented in the following sections.

A consultation with University of Montana Institutional Review Board was conducted in March 2019. Subsequently, a separate draft application for review had been submitted to the University of Montana Institutional Review Board. The application was approved (IRB protocol No: 53-19) under the Exempt category. As noted in the approval letter, the researcher was required to notify the IRB if there were any changes to the originally approved protocol, if any unanticipated or adverse events occur, and to ensure training certificates of research team members were current.

**Data Collection Methods**

After receiving permission from the Principal Investigator, all personal information in the archived data were available only with pseudonyms. The types of archived data analyzed in the study were 7 transcripts of teacher debriefing sessions and 12 transcripts of teacher small-group discussion facilitation. Original research that provided these data already removed all personal identifying information only accessible to the original study investigator. Finally, the archived data were stored in a password protected computer.

**Data Analysis Methods**

*The teacher workshop*

A three-and-a-half-hour teacher workshop was conducted before teachers participated in the original study in November 2017. The workshop aimed to provide both theoretical under grounding of Collaborative Reasoning discussions and cases of real
classroom teachers implementing the discussions themselves. During the workshop, teachers were introduced to theories and practices of Collaborative Reasoning, particularly the procedures and norms. Teachers were presented with ground rules during discussion, such as speaking without raising hands, talking with one another and not only to teacher, thinking about ideas and not people, and encouraging equal participation. Norms for argumentation included supporting positions with reasons and evidence, considering different sides of an issue, and challenging others’ ideas.

Teachers then watched videos and identified the nine instructional moves, i.e., prompting, thinking out-loud, asking for clarification, challenging, stepping in and reminding, encouraging, fostering independence, summing up and regrouping, and debriefing. In the next part of the workshop, teachers discussed an excerpt showcasing instructional moves an exemplary teacher used to better understand what Collaborative Reasoning looks like in the actual classroom setting.

Qualitative Analysis

Linguistic ethnography was employed in this study, which is “an interpretive approach which studies the local and immediate actions of actors from their point of view and considers how these interactions are embedded in wider social contexts and structures” (Copland & Creese, 2015, p. 13). This approach emphasizes on the “naturally occurring interactions and communicative practices shaped by social actions, issues, and realities” (Kulavuz-Onal, 2018, p. 118).

The present study similarly followed the analysis of Sedova (2017) as well as analysis by Copland and Creese (2015) as shown in Figure 3. Initial analysis consisted of examining field notes and the types of talk engaged by researchers and teachers. Next,
during integrated analysis, results from initial analysis were combined and cross-referenced to theoretical literature. In the last stage of analysis, selected sections of data were carefully examined to refine findings. The next section will further discuss the process of analysis referring to Figure 3.

Figure 3. Stages of Analysis adopted from Copland and Creese (2015)

The first stage of the analysis included examining field notes, transcripts, and baseline teaching videos to observe their typical day-to-day teaching. Using indicators of IRE (Initiate-Response-Evaluation) and dialogic teaching, researcher determined whether the baseline teaching presents more indicators from the former or the latter. Next, field notes, transcript, and video of the first teachers’ group debriefing were examined to identify types of talk and the purpose of the talk. Results from reviewing the first
teachers’ debriefing were utilized as initial coding themes to be compared to the second Collaborative Reasoning discussion.

Besides using themes identified in the first teachers’ group debriefing, researcher also referred to the nine instructional moves (such as prompting, thinking out-loud, asking for clarification, challenging, stepping in and reminding, encouraging, fostering independence, summing up and regrouping, and debriefing) to look at teacher’s talk. Students’ talk was also examined by comparing it to the structure of the argumentation house that were presented to the teachers and students before, such as positions, reasons, evidence, challenges/ counterarguments, responses to challenges, and evaluation/ consideration. The goal of such comparison was to determine whether teachers applied what they had reflected on during the first group reflections to their second discussion facilitations, and if so, whether the instructional moves were successful. The analysis continued until the last teachers’ group reflection was compared with the last Collaborative Reasoning Discussion. In the end, researcher compared each teacher’s teaching video post-intervention to the baseline teaching videos as shown in Figure 2.

To address the first question and identify themes emerged during teachers’ group reflection, the analysis followed the six steps: 1. Outlined the general organizational structure of the teachers’ group reflective interviews; 2. Searched for transitional markers in the discourse—markers that indicate shift in topics during the interviews; 3. Identified themes that emerged within each phase of discourse, as separated by the transitional markers; 4. Identified and analyzed connections among the themes; 5. Examined the nature of reflection (descriptive, interpretive, and critical); and 6. Defined the themes of the entire group reflective interview.
To answer the second question of effectiveness of teachers’ instructional moves, students’ talk and/or behavior before and after the teacher’s speaking turns were examined following these three steps: 1. Within each discussion, students’ talk immediately after a teacher’s speaking turn was analyzed to see if effectiveness was readily apparent or not; 2. Across discussions, the four CR discussions over time were examined to identify whether changes or improvement occurred from early to later discussion facilitation; and finally, between discussions, a teacher group reflection and teachers’ respective discussion facilitations following the group reflection was examined and compare.

Following the steps taken above, the next stage was cross-referencing to theoretical literature which was addressed specifically in the third question of the role of teachers’ group reflections on their actual behavior during CR discussions. Copland and Creese (2015) argues that cross-referencing after perusing data advances researcher “to see patterns across the data and alerted researcher to sections of the transcribed data that had not seemed pertinent the first-time round” (p. 106). By cross-referencing, researcher was encouraged to connect with the disciplines of the study and the empirical data that has been established (Rampton, 2006, p. 404).

Finally, the last stage of the analysis was microanalysis that required immersion into the process of detailed, repeated listening and viewing the data. Copland and Creese (2015) recommended while doing line-by-line analysis of the data, to also ask conceptual questions, such as “Why this now?” “What else could have been done here and wasn’t?” (Rampton, 2007b in Copland & Creese, 2015, p. 107). At this stage, the researcher should provide reasons why particular data is selected, such as by searching for sections
of data that repeatedly occur as well as sections of data that is unusual (Copland & Creese, 2015).

**Issues of trustworthiness in qualitative analysis**

**Trustworthiness of the data.** Trustworthiness of the data were achieved through methods to ensure accuracy and to verify the whole process of collecting the archived data, analysis, and reporting as guided by Creswell and Poth (2018, p. 256). Accuracy is a process of establishing information to be as precise as what participants express when elaborating their lived experience (Creswell & Poth, 2018, p. 255). Verification is a process to double-check the authenticity of the data collection, analysis, and reporting (Creswell & Poth, 2018, p. 256).

**Accuracy.** Accuracy of the data was established during data collection and transcriptions. Researchers collected data via video recorder and field notes. All data were transcribed verbatim using transcription software Inqscribe. While accuracy of data collection is out of researcher’s control for the present study, verification of data analysis can be achieved through multiple procedures.

**Verification.** As suggested by Creswell and Poth (2018, p. 267), the process of verifying data analysis requires multiple procedures as completed in this study. First, researchers discussed an initial code list along with the definition. Next, the codebook was applied to several transcripts, then the results were compared across multiple researchers. After assessing and reporting the intercoder agreement, researchers revised and finalized the codebook to conduct further coding.

**Limitations and delimitations**
While limitations are potential weaknesses relevant to the study, delimitations are characteristics that limit the scope and define the boundaries of the study (Creswell & Poth, 2018). Limitations of the study design primarily lies on the data that has been collected. The study was proposed after a completed research. Therefore, to some extent, the researcher did not have control over how data was collected and might not be aware of issues that occurred during data collection. Several other limitations were due to teachers’ busy schedule which resulted in one cancelled group reflection session as well as absence or late participation during a group reflective session.

As shown in Figure 2, the study is limited to analysis of teachers’ group reflections, teachers’ small-group discussion facilitation in the beginning, middle, and end, and teachers’ teaching before and after participating in the study.

**Summary**

The purpose of the study was to examine teachers’ learning to adopt a dialog-based teaching: Collaborative Reasoning discussion. Single instrumental case study framed the study design while the analysis of findings included the interpretive approach of linguistic ethnography that subjects the interactional data to line-by-line analysis. Field notes, videos of teachers’ group reflections, and especially transcripts of the reflections were examined and compared to teachers’ discussion facilitation in the beginning, middle, and end of the study.

**CHAPTER 4**

**FINDINGS: TEACHER GROUP REFLECTIONS**
To understand trends in teachers’ group reflection, six analytical steps were employed that include: 1.) Creating outlines of general organizational structure of the teachers’ group reflections; 2.) Searching for transitional markers in the discourse—markers that indicate a shift in topics during the reflections; 3.) Identifying themes emerging within each phase of discourse, as separated by the transitional markers; 4.) Examining the themes identified and analyzing connections among the themes; 5.) Examining the nature of reflection (descriptive, interpretive, and critical); 6.) Defining the themes of the entire group reflections.

During the third analytical step, three main themes emerged: challenges, progress, and support. These themes are related to procedural and technical understanding and implementation, philosophical and conceptual understanding, and logistics. The three areas reflected changes over time as teachers gradually became familiar with the different aspects of the discussion. Procedural and technical understanding and implementation were identified when teachers faced difficulties or celebrated successes in scaffolding discussions using instructional moves (prompts, clarifies, encourages participation, challenges, sums-up, and debriefs) and aspects of argumentation (position, reason, evidence, counter argument, and rebuttal). Philosophical and conceptual understanding was identified when teachers showed confusion, asked questions, and opposed certain aspects of the discussion. Logistics were identified when teachers expressed concerns over classroom and time management.

**Summary of Findings**

*The teachers*
There were three fourth-grade elementary school teachers in which the data analysis were based on, namely Ms. Janek, Ms. Logan, and Ms. Anthony (all names are pseudonyms). All teachers completed a survey at the beginning of the study, indicating that they all held a Master’s degree in Education. Not familiar with Collaborative Reasoning discussion methods, each teacher had different teaching experiences and motivations in joining the study. Ms. Janek had taught the class for four years. Having served as an adult literacy coach for the Reading Recovery Program for over a decade, she incorporated the book club discussions in her class as a way to develop students’ reading comprehensions. She was willing to try Collaborative Reasoning discussion methods that adds the component of critical thinking and collaboration in discussions. Ms. Anthony recently started her teaching career in this school after having completed her teacher licensure requirement. She was motivated to try Collaborative Reasoning discussion method as she could practice dialogic pedagogies from her coursework. Lastly, Ms. Logan had taught in elementary schools for 39 years. She expressed her interested in trying the discussion method after having learned that the other two teachers signed up to participate.

The students

This dissertation examined eighteen students out from the 76 fourth-grade students who participated in the original study (39 girls; Mage = 10.0 years, SD = 0.2). Within each teacher’s classroom, four Collaborative Reasoning discussion groups were assigned, and Group 1 were chosen for analysis in this dissertation. Each group consist of five to six students. Choosing one group per teacher allowed detailed investigation of
teachers’ gradual change within a group within the finite time and resources available to complete the dissertation.

During the six-month study, seven teachers’ group reflections were conducted. The first six group reflections were carried out after all three teachers facilitated Collaborative Reasoning discussions. They will be referred as Teachers’ Group Reflection 1 to 7. There was no Group Reflection 4 due to scheduling issues because the 4th Collaborative Reasoning discussion was planned at the beginning of the spring semester while a mid-study assessment was also scheduled. It was impossible for the teachers to provide extra time for a group reflection. However, after the 5th discussion, transcripts from the 4th discussion were presented as prompts for teachers to reflect on during Teachers’ Group Reflection 5. In addition to the missing reflection, there were a few reflections where not all teachers participated fully. Ms. Logan joined Teachers’ Group Reflection 1 after it had begun. During Teachers’ Group Reflection 7, Ms. Logan was absent and Ms. Anthony joined late. The last group reflection, Teachers’ Group Reflection 8, was a concluding session where the three teachers shared their overall experiences.
Figure 1. Emerging Themes in Teachers’ Group Reflection Sessions

Total speaking turns from the 1st to the 7th Teachers’ Group Reflection were 160, 290, 124, 313, 322, 346 consecutively. There was a total of 1,825 speaking turns of the six transcripts, among which 364 speaking turns recorded teachers’ reflections of their struggles, progress, and support from the researchers as well as their peer-teachers. Within these speaking turns, almost half (47%) of the reflections were “challenges”, followed by “progress” (35%) and “support” (18%). Figure 1 shows numbers of speaking turns under each of the three categories across time as teachers learned to facilitate the Collaborative Reasoning discussions. The X-axis represents the first through the last group meeting and the Y-axis represents the quantity of speaking turns. The graph shows that, despite teachers’ constant struggle to implement the method, they appeared to be more confident towards the end. Consistently, as their confidence increased, the amount of challenges gradually decreased.
Speaking Turns in Teachers’ Group Reflection Sessions #1 through #7

Figure 2. Speaking turns in Teachers’ Group Reflection Sessions #1 through #7. Note that the fourth Teachers’ Group Reflection session was not conducted due to the teachers’ demanding schedule as they approached the end of the Fall semester.

Some of the challenges that teachers faced were struggles in conducting and understanding the new method (67%), uncertainties on whether to intervene or not, and asking for suggestions to deal with such situations (16%), negative impressions of students’ readiness, the content of their talk, and behavior (8%), teachers’ negative emotions (7%), and external barriers (2%). As teachers grew more confident, their reflection on progress significantly improved after the fifth group reflection. As shown in Figure 2 among a few topics under “progress” were teachers’ experiencing success (70%) in discussion facilitation, positive impressions (20%) on students’ participation (function, amount, and attitude), and positive emotions (10%). Equally, since the struggle expressed during group reflection lessened, supports from researchers and fellow teachers also decreased. As shown in Figure 4, “support” from peers and researchers consists of
suggestions (69%), encouragement (24%), and scaffolding in understanding the method (7%).

**Teachers’ Group Reflection 1**

During the 1st teachers’ group reflection, the theme of procedural and technical understanding dominated the reflection. Teachers described struggles in scaffolding during discussion particularly when navigating their new role and getting familiar with the discussion’s procedure and norms. First, they were unsure of their role in the discussion as shown through confusion on how to actually facilitate and felt unnatural when directing. In the first excerpt below, Ms. Janek specified her experience and expressed concern about whether she facilitated it correctly. She also felt unprepared. In the second excerpt, Ms. Logan expressed her feeling of being overtly unnatural when prompting.

*Well you know, I think for me, it's a personal of what I'm supposed to be doing. Am I doing this right? Am I doing this right? I'm like, "What am I supposed to be doing [laughter]?” And I still-- I mean I get the feel for it but I don't know if I'm-I wanted to have my list of verbs in front of me... I feel like I wasn't as prepared as I could have been. (Ms. Janek)*

*And I don't know-- I think I did some prompting, but I think maybe it was too overt. I mean it was, "I haven't heard what," you know. "We haven't heard-- we haven't heard from-- Echo," I think it was. You know, whoever and-- so anyway. And I get kind of deer in the headlights when I first do this kind of stuff. (Ms. Logan)*

Further, teachers also found it difficult to encourage equal participation as some students dominated the discussions while a few others had difficulties sharing ideas. Lastly, they were unsure how to direct students to speak to each other so that they were not dependent on teachers’ feedback and affirmation in particular. Ms. Anthony shared
her experience in the excerpt below. Although she explained the ground rules, students still looked at her for her feedback, which the other teachers found relatable:

*Yeah, I just used this, we encourage everyone to participate. And then we do not talk when other people are talking. We talk among one another not only to the teacher, that is so hard to break. They just want to look at me.* (Ms. Anthony)

Teachers also expressed the need to have explicit mini lessons on building arguments because of the following instances that happened during the first discussion. There were groups that were undecided or did not take a position on the Big Question raised from the story for them to discuss. There were also students who used their personal experience too much as evidence to support their reasoning and seemed to neglect the text/story.

Although it appeared that teachers were struggling to facilitate, they also reflected a few positive impressions. For example, Ms. Janek noticed several of her students started to connect with each other’s ideas. Ms. Anthony was also satisfied with her debriefing where students understood that they were discussing to agree or disagree with *ideas*, not with the *person*, which is one of the core principles of Collaborative Reasoning discussion. Ms. Logan was pleased by a student with a minority view who participated more after she encouraged the student to do so.

*And I thought it was interesting there was-- one of the girls in my first group wasn't saying a lot, and when I actually said, "You know, I haven't heard from Natalie. What were you thinking?"... And she said, "Well, I don't really want to." But then, by the end she was really-- she was talking quite a bit. And she was of the minority position too. I mean the other kids felt-- didn't feel the way that she did. She still really felt like zoos were an okay place. Certain kinds of zoos. So anyway, so that was kind of neat.* (Ms. Logan)

As a form of support and response to teachers’ reflections on struggle and progress, the principal researcher commended on the teachers’ successes and provided
further guidance. For example, teachers discussed the principle of open participation versus Initiate-Response-Evaluation mode, use of evidence, and practical suggestions on instructional moves, such as prompting and encouraging equal participation. In the end, teachers were encouraged to include a supplemental activity in the next discussion, for example, utilizing an argumentation house with explicit identification of position, reasons, counterargument and rebuttal to improve students’ argument quality.

**Teachers’ Group Reflection 2**

The main themes for the 2nd group reflection were procedural and technical understanding as well as philosophical and conceptual understanding. Teachers reflected on their progress as students expressed their enjoyment of participating in small-group discussions. During the previous reflection, teachers felt the need to teach component of arguments using an argumentation house template that the researcher provided. All three teachers recognized the potential benefit of going through the argumentation house and also planned to incorporate Collaborative Reasoning discussions in other areas of teaching, despite the fact that they were not fully able to incorporate it yet.

Ms. Janek and Ms. Anthony talked about students’ positive comments. Ms. Janek stated that students loved the discussion because they “they feel like they’re heard” and they also started to use expressions such as “I appreciate … but disagree…”,”I challenge your thinking …”. The same also happened in Ms. Anthony’s class. One of her students mentioned, “I wish we could do this every day!” Ms. Anthony believed that students loved Collaborative Reasoning discussions because “they actually get to talk.” Ms. Logan felt encouraged that students loved the discussion, and she was pleased to
successfully use the tally method to assess the discussion flow. The excerpt below illustrates Ms. Janek and Ms. Anthony’s positive impressions.

Ms. Anthony: I think it's so great. They love it because they actually get to talk. And they actually get to--
Ms. Janek: And they feel like they're heard.
Ms. Anthony: It's pretty cool to see.
Ms. Janek: And I got such a kick out of the language because I told them, "You can say things like, 'I challenge your thinking.' Or, 'Well, I appreciate that but I disagree.'" They've tried so bad before [laughter]. All I got was-- even when they weren't challenging [laughter], when they were agreeing, "I'd like to challenge your thinking [laughter]." I'm going, "Well, you're not really challenging."

Although students seemed to love the discussion, teachers faced challenges in a few areas related to the quality of students’ argumentation, and the timing of when to talk and how much they should talk. While Ms. Janek expressed such uncertainties, Ms. Anthony felt she talked more than she should. Both teachers agreed that students needed more coaching to use evidence to support their positions and reasoning. In terms of behavioral issues, several students were undecided, unprepared, struggled with story comprehension, went off and even dominated discussions.

Besides talking about procedural aspects, teachers also discussed about the philosophical and conceptual aspect about thinking and reasoning as a social and collaborative process. In particular, Ms. Janek challenged the discussion format as she found her students seemed to be unprepared during the discussion. She asked if students could write their arguments down prior to discussion so they were more prepared. She believed that with preparation, students would be more certain of their positions.

Ownership of their position. They have ownership. They really understand why they believe what they believe. They've sort of practiced it. So when they come to the table to communicate, I feel like they're better prepared to give their positions and their statements. They're a little bit more
eloquent. They know what they want to talk about. They're a little bit more passionate. That's why I thought. But maybe it would just happen without it. (Ms. Janek)

The lead researcher assured Ms. Janek that, despite the benefits of advance preparation, the unique part of the discussion is in the abundant opportunities that it provides for students to reason together in a group setting with their peers. The format of Collaborative Reasoning discussion was designed for students to exercise thinking as a social process by actually engaging them in the discussion.

The whole idea of why they do collaborative reasoning rather than just the reasoning is, actually, a lot of times we don't know how we think until we start to talk to other people... yes, I think it's definitely valuable for kids to be prepared, but I also think that's a unique part of collaborative reasoning. We allow kids to really understand reasoning and thinking is a social process. It's a collaborative process. And that piece is more of an individual part of now you go through this reasoning piece, and hopefully, you understand the pros and cons. You'll either be more firm with your position or change it. (Principal Researcher)

The 2nd reflection ended with the principal researcher offered strategies that teacher could try before and after discussion to strengthen students’ argumentation. Before the discussion, teachers may ask students to engage more with task, such as producing a very short pending position. After the discussion, teacher may ask students to draw an argumentation house or state their opinions in writing to clarify their arguments.

Teachers’ Group Reflection 3

Similar to the 2nd group reflection, two main themes emerged during the 3rd group reflection that include both the procedural and technical understanding of Collaborative Reasoning discussion and its philosophical and conceptual aspect. Teachers identified more challenges they faced due to the moral nature of the story being discussed, but also
communicated more positive impressions on successful use of instructional moves to improve students’ reasoning and behavior. The story was about Kelly and Evelyn, two art-talented classmates taking part in school’s art contest. While Kelly worked hard for her painting, Evelyn could not care less about winning. On the submission day, Evelyn gets distracted and leaves her painting outside. Kelly realizes that in a few minutes, not only Evelyn will miss the deadline, her paintings will also be ruined as the rain started.

Teachers were uncertain about how to intervene when students held the same position. Different from previous discussions where there were more balanced positions, a majority of the students took the same position during this round of discussions. They argued that they should do the right thing, that is, Kelly should tell Evelyn. Teachers still found themselves uncomfortable in the discussion format. While Ms. Logan and Ms. Janek experienced the state of “confused”, “haven’t struck a balance”, and “disequilibrium”, Ms. Anthony felt “in-between.”

Ms. Logan mentioned that students responded more to her than to their classmates. Students also seemed to be less engaged although she felt she had tried to take a more active role. Several students disrupted the discussion flow by “just wanting to hold the floor, but doesn’t add anything to the discussion.” The excerpt below illustrates Ms. Logan’s experience:

*Well, I know I took a more active role in the last one [than] I had in the previous ones. And I'm not sure that-- I don't know. I guess I think I need more work. I mean, more practicing doing it because I think the kids then got back into responding more to me than they were to each other. And they did okay, I think, at reminding themselves, and I prompted them, I think, too. But that's the thing that I wonder. I haven't struck a balance, I guess. (Ms. Logan)*
Ms. Janek expressed that she also had not yet felt comfortable in her role. She stated, “the more I do it, the more I’m confused.” On one side she wanted to increase the energy of the group; on the other side, if she stepped in, she was concerned that she would give too much direction. She asked for a good modelling video to guide her to be more natural when interjecting. Ms. Anthony added that managing her facilitation role was “a hit-and-miss.” Sometimes, she felt she was correct not to step in, but other times she wished she had done more.

Despite facing these challenges, teachers reported on several positive impressions. In the previous reflection, the principal researcher suggested the teacher to conduct a pre-discussion activity so that students had a goal in mind before discussion; and a post-discussion activity to reflect on their performance. Ms. Janek found the pre-discussion activity helpful to build more energy. Her students were more goal oriented in that there was a conscious effort to be better communicators.

And I had some kids have breakthroughs, which was awesome. They really did. You could tell they were like-- and I did, this time, remember to say, "Okay, we set some goals for ourselves, and does anybody remember what those goals were?" And one of the little girls said, "That [Student A] is going to talk more [laughter]." But they were very specific and then Integrity went like this and shook her head like, "Yeah. I got to talk more." And it was really cute because then she contributed four times... So when we got done at the end, they went right to [Student A], "So how'd you do?" "[Student A] talked more [laughter]." I was very proud of her, so that was cool. And then there were a couple other things that they remembered that they were going to do and you could see a very deliberate action by my little [Student B]. One of the kids said something and he goes, "I agree with--!" And he just sat up and proud, this, "I agree with her!" And then he kind of looked like he surprised himself [laughter]... So you could see they were thinking about what their goals that they had set for last time, how they wanted to. So I thought that was good, that they're thinking about it, yeah. (Ms. Janek)

I think there's definitely improvement socially, and I feel like it was about the same for stating reasons and evidence as in the previous. But I felt
like, socially, there were definite-- they were making a conscious effort to be better communicators. They talked about that they needed to look at each other when somebody was speaking. And so, in their reflections last time, it-- I think they made a just more conscientious effort to try what their goals were. (Ms. Janek)

Ms. Anthony stated that setting aside a short time before discussion to reread the story helped students’ comprehension. Additionally, she was pleased that her students seemed capable of debriefing their discussion on their own; although it was cut short due to more time spent during the pre-discussion activity. Both Ms. Anthony and Ms. Logan utilized tally marks to inform students at the end of discussion. They hoped to encourage equal participation and reminded students who tended to talk more to allow space for other members to join in.

Guided by the principal researcher, teachers also reflected on the philosophical and conceptual aspect of the discussion. The excerpt below illustrates the principal researcher pointing out possible reason why it still felt unnatural for teachers to facilitate the discussion, that is, students had to recognize the shift in their teachers’ roles during the discussion.

*The difficult part is, what I saw in the discussion is I think children have a difficult time to understand you as a participant in the discussion. They think you as someone to report to. That’s why, whenever they want to say to you, they start to raise their hand, they start to shift from a discussion mode to more answer-question mode. (Principal Researcher)*

At the end of the 3rd reflection, teachers brainstormed with the researcher on strategies to increase several students’ participation and motivation. One strategy was to set a time with students to reflect on their goals. Deliberately asking students of their goals can be useful for students to gain awareness of why they participate in such discussions.
Teachers’ Group Reflection 5

The 5th teachers’ group reflection was about the story “A Coat for Mr. Snowman” where students discussed whether putting on a coat will prevent the snowman from melting. Ms. Logan was present in the beginning of the session, but had to leave early.

The overall theme for the fifth reflection is procedural/technical aspect. Teachers discussed strategies to scaffold more effectively, such as dealing with one-opinion group, students with specific issues, and off-topic discussion. When navigating her group that held the same position, Ms. Janek was still ambivalent about when to step in and finding herself holding back especially because in her first group, everyone had the same opinion. She also had one student who had a difficult time expressing ideas. Ms. Anthony noticed the same. She felt that small-group discussions had not yet helped several students who needed academic support. The students were able to comprehend the text, however, had not participated during discussion. Ms. Logan was not pleased that her group did not cite evidence from the text. She thought it was due to the lack of strong evidence from the story.

Despite persistent challenges, Ms. Janek and Ms. Anthony expressed positive impressions of their students. Ms. Janek had just started to feel more at ease facilitating discussions. She also noticed that her students recognized on their own when they were off topic. Similarly, Ms. Anthony found her students able to independently remind each other when they started to talk about unrelated subjects. She was also impressed by her students’ reasoning. “I was just surprised by what they were able to discuss… they were able to use some logical thinking around.”
During the 5th group reflections, the researchers prepared two types of transcripts for teachers to closely examine their talking turns during facilitations. One transcript was from the sample excerpt shown at the teacher workshop where teachers had been critical of the video and commented on the lack of energy and engagement from the teacher. When reviewing the transcript again at the 5th group reflection, teachers were much more positive and identified a number of effective instructional moves. They were able to point out successful instructional moves used by the exemplary teacher, such as her strategies to set the discussion, to increase participation, to ask for clarification, and to encourage students to respond to each other’s ideas. Teachers also noticed her ineffective moves, such as stepping in too quickly, which disturbed the discussion flow. After discussing the example transcript, teachers appreciated that an ideal teacher’s facilitation would never have to be perfect: Even with an experienced teacher as portrayed in the transcript, facilitating a discussion was not an easy task as she still made ineffective instructional moves.

The second set of transcripts included recently transcribed discussions of Ms. Anthony’s, Ms. Logan’s, and Ms. Janek’s facilitation. Teachers reflected on each other’s facilitations by reading their most recent transcripts. Ms. Janek found the transcript particularly helpful to examine her actual talks during discussion.

See, you can see, listen to this. So it said there hadn't been any-- didn't it say something about that there hadn't been any-- I'm trying to cue them. I sound like I'm talking in broken English. But I'm like, kind of like trying to give them a little couple of words, so they'll take off and, oh yeah. But yeah. Oh, geez, this is interesting. So what do you do to [inaudible]? Yeah, I'm just--... We'd love to hear from you, Sally. Sally, Sally? (Ms. Janek)

Boy, I really am redirecting them to the question, I can tell that. It's—(Ms. Janek)
She further added that reading her own transcript was valuable to see the importance of setting the stage prior to discussion; and more importantly, to see her progress that she seemed to be more confident, “I can read it and I can say, ‘I know what I’m doing. I’m trying to not lead without giving them anything.’” As for Ms. Anthony, the transcript particularly helped her to notice a student who struggled socially that negatively affected the discussion. She gradually realized a certain behavior from the student that discouraged another student’s participation. The excerpts below illustrate the conflict in Ms. Anthony’s group:

Oh, this was the day that Lisa was about to cry... So we had some big emotions in the middle of our discussion... Yeah. That’s why I had to go back and talk about the ground rules again. (Ms. Anthony)

Oh, it's just the dynamics of these two kids, Lisa and Ian. It's just—Ian’s just not getting-- he's not coming to school. And then he joins this group and, it's just that his social skills are not really being developed throughout the year, where you're seeing other students’ social skills being developed because Ian is dealing with so much emotional issues right now. And then, Lisa, though she did talk a lot... I saw a change from her in this group, from the one before, but then he brought up, well, you're just-- I feel like you're talking too much, but. And then it got her, it just was a— (Ms. Anthony)

At the end of the discussion, the principal researcher praised that Ms. Janek and Ms. Anthony have progressed since the beginning and asked for suggestion on how to better support Ms. Logan. Ms. Logan seemed to be still very hesitant and minimally intervened while it could have been helpful for students had she interject more. As a long-time colleague, Ms. Janek mentioned that Ms. Logan’s early training as a teacher might have influenced her hands-off style. Ms. Janek suggested that researcher present during Ms. Logan’s discussions could co-facilitate when needed.

Teachers’ Group Reflection 6
Procedural and technical aspect was the main theme since all three teachers struggled facilitating with a scientific story “Deep Water.” The students discussed whether the boat will sink if it is in the deeper water. For most of the time during this reflection, teachers focused on a number of challenges they had. Only Ms. Janek mentioned a progress she observed in her students’ performance. At the end of the reflection, the principal researcher provides suggestions and recommendation related to utilizing a scientific story for Collaborative Reasoning discussion.

Ms. Janek reflected on her struggle navigating the science story. It was still challenging to encourage equal participation when several students kept dominating and a few other students remained quiet. She expressed her difficulties below.

*I think that for some reason, it seems to me when we have a science kind of based article, that it's harder. I've been feeling like when there's not necessarily a right or wrong answer, it's easier to not be concerned that you're giving information that you don't want them to get the wrong concept, and in science it seems that that's been there and what my kids said, and I thought was interesting - we talked about this - is the last article they were like, "There's nothing to this article compared to the hunting and killer. That one had a lot to it," and they really seemed to like that. (Ms. Janek)*

--and so it's tough, but from my own perspective as the teacher, it's harder when you feel like there's a right and wrong answer versus one when you can just have different opinions for different reason. (Ms. Janek)

Although overall she felt more comfortable, Ms. Janek was still hesitant at certain points “I'm afraid I am going to ruin the conversation, or I am going to take it. You know, like, they are right in the middle of something that I shouldn't.” Ms. Janek also shared a positive observation from the latest discussion where she was impressed with the language that her students used with each other during the discussion. She felt that to have such training at this age level would benefit her students in the future.
Ms. Anthony encountered similar difficulties managing the scientific story and dealing with students’ behavior at the same time. She felt that the story was “simplistic… and not a lot of evidence” where students could pull evidence from. There were dominant and quiet students as well as students who went off-track from the main question on whether the boat will sink in the deeper water. She felt uncertain whether to intervene or not when students went off track from the main question. She wanted to keep redirecting students back to the main question; yet she also wanted to let students figure out for themselves. In addition, it was not easy to invite some of her quiet students to talk without putting them on the spot. She felt that her intervention might have exaggerated the issues for students who had difficulties participating.

Parallel to the other teachers, Ms. Logan expressed that it was challenging to balance between facilitating using a scientific story and solving students’ behavioral issues. She reflected that although she understood that she could challenge students to think of the opposite point of view, she “didn’t feel right offering a different viewpoint – a false viewpoint, when it was so obvious that that’s not true.” As a result, her students’ discussion went one-sided.

Responding to the many struggles that teachers expressed, one of the research assistants Cassie (pseudonym) offered an additional insight. As a pre-service science teacher, she pointed out below that contrary to teachers’ negative impression, the discussion was actually somewhat effective. During her observation, one of the groups were able to solve the misconceptions on their own.

*Oh my goodness. I like the story, but I want to be a science teacher so maybe that's why. But today in your first group, I really thought it was kind of beautiful because they went out and they were-- initially, I could see these misconceptions about density. A few have even said, "If*
something's bigger, it's going to be heavier." And they went through and just hashed that out to the point that it doesn't really matter how big it is. It depends on what it's made out of. So they'd like figured out density all on their own without somebody telling them, "What is mass divided by volume?" And that just seemed to-- and that was a clinching point for me [inaudible]. Like yeah--... The deep water has nothing to do with it. It floats because it's either less dense or displaces water, right? And they did that on their own without anyone really nudging them towards it. (Cassie)

I think it's important because even if they might not figure out the misconceptions while they're discussing it, at least as a teacher it gives you talking points in the future. So when you cover density or buoyancy, you kind of know where your students are far as what their experiences have led them to believe about something. I like this one. Just hearing where they go and where their reasoning is. Because a lot of times if they have a misconception, they can be really good about giving evidence for why it's true. Like [Student C] started out, and I'm like, "Woah. She's probably going to convince everybody [laughter]." (Cassie)

At the end of the 6th reflection, teachers and researchers concluded with several strategies that teachers could employ for future facilitations. First, discussion using science stories can a way to allow students to examine their possible misconceptions. The problem discussed in scientific stories can potentially provide students with an independent opportunity to wrestle with the misconception and figuring out whether their existent understanding is right or wrong. Second, to improve students’ participation and reasoning, teachers can utilize certain reflective activities. For example, teachers can watch their own discussion videos, add more time in the end to debrief, and mix students’ seating arrangement within a group.

**Teachers’ Group Reflection 7**

During the 7th teachers’ group reflection, three themes emerged related to procedural/ technical, philosophical/ conceptual, and logistical aspect. Despite similar challenges, teachers’ positive impressions noticeably increased especially when talking
about students’ growth. In terms of logistics, teachers reflected on the difficulties managing time, bigger class as well as balancing with curriculum demands. During this reflection, Ms. Logan was absent and Ms. Anthony joined the discussion late. Ms. Janek had the most opportunity to reflect on her experience.

Ms. Janek specified several positive impressions related to her more comfortable role in the discussion. She was also encouraged to notice improvement on students’ leadership and discussion skills. She expressed that since she had practiced facilitating, she would be able to further utilize the method. The excerpt below reflected her excitement.

*It's good. It's really good. It's really a good thing. And next year, I'm trying to think, like, now that I've been part of this part, now I can see where I'm going to be able to start with it. We do so much listening and speaking work at the very beginning of the year, establishing our school rules. Everything about how you listen with eyes, ears, and heart, how you listen for understanding, what your body position looks like. We do so much work with that. And I feel like we do it and we practice with books. But this is a really active way, I think, they'll be able to. Yeah. So, I'm excited. (Ms. Janek)*

The excerpt below further illustrates Ms. Janek’s impressions. She explained how participating in small-group discussion provided opportunities for students to develop their oral communication skill. She also further commented that students seemed to show more ownership when contributing to the discussion.

*Yeah. That was really cool. And I love it that other kids that normally wouldn't shine, like, in written work. They're always shining in that way, but they don't have to shine that way. They can have a moment to be the leader in a different way. I love that. I love that part. This is so powerful. (Ms. Janek)*

*But it was their own aha, a new thought. They weren’t necessarily just grabbing on what somebody else said... it was like their own now, not that they had just heard it from somebody. (Ms. Janek)*
Besides recounting on student’s progress during discussion, Ms. Janek also stated how the discussion had helped her with other class activities, such as her Book Club and writing assignments. Ms. Janek was impressed by students’ increased motivation. They were increasingly more certain in expressing their thoughts and citing evidence. The excerpt below illustrates her positive impressions.

_I think it's made book groups much more collaborative, our books groups became-- I think, I just feel like the kids feel like they're doing very important work, which makes them feel like, "If I'm doing very important work, I need to do my very important work." I feel like there's a lot of motivation for it. I feel like they feel pretty connected to each other, which that's been very good... I feel like they think that they aren't floundering when it's time to state what they believe in, why they believe it. They cite text evidence now, like crazy. I mean, it's in their books. Just to show you some examples of carryover, like this is pretty impressive._ (Ms. Janek)

Ms. Anthony who joined late in the discussion reflected on her experience conducting a mid-term reflection with her students. They watched a clip of their own discussion and then discussed specific elements of the clip as a whole, such as whether students appropriately used reasoning and evidence to support their position(s), considered other perspectives, and stayed on track during the discussion. Before the mid-term reflection, she was unsure and worried that students might be sensitive to comment on their own videos. She was pleasantly surprised by how much her students enjoyed the activity: “I think it went well… I was way more nervous about them being sensitive to it. And they weren’t sensitive to it at all [laughter].” She found the mid-term reflective activity invaluable. Students also became more comfortable to change perspectives when they encountered opposite thinking from their peers.

_Yeah. No they changed. They were persuaded by other people’s reasoning to change their positions. Yeah, it was neat. And unless something must have—I think it was because, in the reflection activity, the question was do_
we change our positions when there has been adequate reasoning given or something like that, yes. And I think that maybe made them feel more comfortable being exposed to change their positions. (Ms. Anthony)

Both teachers further identified certain challenges that still persisted. Ms. Janek realized that there were three areas problematic to manage. First, she explained that at times she still missed the opportunity to guide students to think about the other perspective. She said, “a little trickier than I thought… same position–were just agreeing with each other a lot and saying the evidence… So I just felt like I was just letting them go and I should’ve said ‘Well, hey, what about that.’”

Other challenges that she faced were related to curriculum that reduced the time flexibility and class management. Standardized tests with a demanding amount of curriculum for 4th grade made it difficult for teachers to find extra time to devote to learning more about Collaborative Reasoning discussion, as Ms. Janek stated “It’s really been about time… The thing that’s been so sad is just the amount of stress on the schedule, because we can’t get-- we just get enough to know what, ‘Okay, we got to move.’ It’s like, you don’t get to sit and study it.” Additionally, she felt managing a class while being present in a small-group discussion was problematic. She felt divided: “you’re not 100% here. I mean, behind you… you’re still wondering what is going on over there-- it’s really hard to get yourself trained at.”

As for Ms. Anthony, time restriction was also an issue. She did not always have sufficient time for debriefing. She still found it hard to balance when to talk and when to hold off during discussion. She wanted to intervene when students went off topic or when several students had side conversations. Yet again, she also did not want to disrupt the flow of the discussion. She expressed another persisting issue in several students’
talking, “they’re floundering, sometimes they just want to talk because they think someone should be talking.”

Towards the end of the 7th reflection, the topic changed to philosophical/conceptual aspects related to the scaffolding principle. As teachers still faced challenges, the principal researcher pointed out a strategy teachers could use to observe the effectiveness of their own scaffolding. She specified three characteristics to look for and said, “contingency–whether you do it at appropriate time. Fading over time so do you do it less frequently over time. And the third one is transfer of responsibility.” The reflection concluded with teachers’ celebrative comments on their successful mid-term reflection with students.

**Phases of Teachers’ Reflection**

Themes emerged from each teachers’ group reflection were chronologically summarized above that include teachers’ perceived challenges, progress, and support. These emerging themes are related to procedural/technical understanding, philosophical/conceptual understanding, and logistics part of the discussion. The 5th teachers’ group reflection was a unique session compared to other sessions because teachers had the opportunity to reflect on transcripts of Collaborative Reasoning discussion, both from a sample classroom and from their own discussions. The 7th teachers’ group reflection was also different because Ms. Janek had the most opportunity to share due to the absence of Ms. Logan and the late participation of Ms. Anthony. Examining through the trends of these reflections, three phases of teacher learning journey were categorized. Although each phase has its own characteristics, the three phases still share similarities. For example, all phases contained teacher reflections on their struggles in managing students’
behaviors, although such element was mostly pertinent in Phase 1 and 2. Improving argument quality such as getting students to connect reasoning to their position most appeared in Phase 1; however, another type of improving argument quality such as considering other perspectives occurred primarily in Phase 3.

**Phase 1**

In Phase 1, teachers faced challenges in figuring out their role, getting students to engage, and improving the quality of students’ argumentation, especially related to using reasoning and evidence to support their own position. Teachers attempted to understand and apply instructional moves while at the same time learning norms of Collaborative Reasoning discussion for students. Phase 1 mainly occurred from reflection 1 to 3, totaling 574 speaking turns.

It was apparent that the teachers struggled to transition to discussion-based teaching in this phase. Teachers were still getting familiar with several aspects of Collaborative Reasoning discussion. This certainly created tension because they were still new to applying instructional moves while at the same time teaching students how to discuss collaboratively. The latter aspect also consists of two parts that teachers must teach: how to use a logical reasoning and how to express it with their peers. On some occasions, teachers felt unnatural when directing and were ambivalent about when to step in or hold back, and students were still dependent on teachers’ affirmations. Ms. Janek, for example, wanted to have more controlled discussions so she asked if students could prepare their positions, reasoning, and evidence prior to discussion.

One of the main takeaways for teachers during Phase 1 is utilizing pre-discussion and post-discussion to increase students’ engagement and argumentation quality without
interfering too much during discussion. During pre-discussion, teachers practiced setting
the stage using several techniques, such as quick rereading, stating ground rules, and
connecting with the goal from the previous discussion. During post-discussion, teachers
practiced encouraging students to reflect on their collaboration and reasoning skills.

Phase 2

In Phase 2, teachers began to notice that students increasingly became more
independent in navigating some parts of the discussion. Teachers, especially Ms. Logan
and Ms. Janek also shared their struggle when facilitating using a scientific story.
Besides reflecting on struggles and successes, teachers also reviewed their own
facilitation transcripts critically. They found such reviews helpful to identify their actual
speech pattern during discussion, their own progress, and even noticed behavioral issues.
Phase 2 occurred during the fifth and sixth teachers’ group reflection totaling 635
speaking turns.

In Phase 2, teachers reflected on the difficulties using scientific story and, in the end, learned how to utilize it better. At first, coupled with managing students’ behaviors,
such as dominating students and students with special needs, teachers felt discouraged.
For example, Ms. Logan was not able to manage a one-sided discussion because she was
not comfortable offering different viewpoints. Meanwhile, a group from Ms. Janek’s
class was able to hash out the misconceptions on their own, as pointed out by one
research assistant who was also a pre-service science teacher.

During Phase 2, teachers also started sharing more positive impressions on
students’ performances. In one group, Ms. Janek noticed that students were able to
remind themselves when they were off-track. In Ms. Anthony’s class, students were able
to engage in post-discussion with less direction. And finally, discussing transcripts of their own facilitations brought better understanding of their practice. Teachers were able to self-identify their actual talk during discussion, their increase in confidence and ease when utilizing instructional moves, and the importance of pre-discussion to set the stage. One of the teachers also noticed a social dynamic issue within a group through reading the transcript. She was able to further express the possible cause of the issue with hope of improving it.

**Phase 3**

While in Phase 1 teachers struggled to help students connect their reasoning to their position, Phase 3 is characterized by teachers’ trying to get students to think about other perspectives. Other challenges the teachers faced are external struggles, such as pressing logistics issues due to curriculum demands as well as class management. This phase is also characterized by teachers’ positive accounts of their own progress as well as students’ overall progress. Phase 3 primarily occurred during the seventh teachers’ group reflection totaling 364 speaking turns.

Although getting students thinking about other perspectives was still a challenge, there were a few salient positive changes. For example, children seemed to be more comfortable changing positions, and they seemed to have more ownership when stating their opinion and citing evidence. Since Ms. Janek shared the most, she was able to detail her increased confidence mainly due to students’ positive behavior, such as their ability to express themselves in speaking and to incorporate evidence in writing. Encouraged by students’ performance, she was excited to use Collaborative Reasoning discussions format in her other class activities.
Phase 3 is also where logistics issues became more apparent. The curriculum demands prevented teachers from having more time to internalize their learning. Managing a class while facilitating small-group discussions was also problematic because teachers had to accommodate the rest of the class as well.

**Summary**

Teachers wrestled with constant challenges as they tried to incorporate Collaborative Reasoning discussion in their teaching. Along with these challenges, they were also encouraged by the progress of their facilitation and their students’ successful performance. At first, it was apparent that transitioning to discussion-based teaching was a difficult task. With limited knowledge and experience of this type of discussion, teachers had to balance their role as facilitators and at the same time taught students how to discuss using good reasoning in collaboration with their peers.

Although the struggles continued, teachers were encouraged because they noticed a transfer of independence to students, particularly during and after the discussions. In the end, teachers still encountered a newly realized challenge: getting students to think about other perspectives. However, with a better understanding of and more confidence in facilitating, they looked forward to incorporating more small-group discussions in their classroom.
CHAPTER 5
FINDINGS: TEACHER FACILITATIONS

To understand teacher implementation, two analytical steps were employed. First, the transcripts of the teachers talking during the discussions were examined and identified types of instructional moves they employed. Instructional moves may include prompting, reminding students of norms for discussion, asking for clarification, encouraging, fostering independence, thinking out-loud, and challenging/considering other perspective. Second, the effectiveness of teachers’ instructional moves was examined by looking at students’ talk and/or behavior before and after the teacher’s speaking turns. To determine effectiveness, the following steps were utilized: 1.) Within each discussion transcript, students’ speaking turns were examined following a teacher talk. When effectiveness was not readily apparent, a few more lines down were checked; 2.) Across 4 CR discussions, changes or improvements from early to later facilitation was examined; and finally, 3.) Between discussions, a teacher group reflection was compared to their respective discussion facilitations following group reflection.

During the six-month study, 8 Collaborative Reasoning Discussions were conducted for each class. For the purpose of this study, the 2nd, the 4th, the 5th, and the 7th discussion of Group 1 from each teacher were chosen. These 4 discussions covered all types of stories, such as a moral dilemma, a policy dilemma, and a scientific dilemma. They will be referred to as Collaborative Reasoning Discussion Facilitation 2, Collaborative Reasoning Discussion Facilitation 4, Collaborative Reasoning Discussion Facilitation 5, and Collaborative Reasoning Discussion Facilitation 7.
Teachers’ Instructional Moves

Teachers employed 207 instructional moves combined from the discussions selected for the six-month study. As Figure 2 shows, from the total instructional moves, 15% were used to set the discussion up. Teachers prepared students by stating the Big Question, going over the norms for discussion, reminding the goals from the previous discussion, and asking students to state their initial position. Next, 38% were used when teachers utilized instructional moves during main discussion where students support their position with reasoning and evidence from the text as well as personal experience. Near the end of the discussion, 12% were used summing-up students’ final position, and 35% were used for debriefing where teachers conducted a short post-discussion reflection.

Figure 3 below illustrates instructional moves utilized during the main discussion. During the main discussion, teachers frequently applied instructional moves, such as prompting (14%), clarifying (7%), and reminding (9%) and less frequently utilized instructional moves, such as challenges (1%), thinking out-loud (1%), and fostering independence (2%).

Figure 2. Teacher Talking in Each Discussion Component
Effectiveness of Teachers’ Instructional Moves

The following section is dedicated to describing each teacher’s group facilitation over the course of four Collaborative Reasoning Discussions. The description will start with a summary. It will be followed with a narration of each discussion that highlights teachers’ successes and struggles when navigating the discussion. The description will also highlight students’ progress and regression when engaging in small-group discussion. The section will end with a summary of all teachers’ group facilitations.

Ms. Anthony’s Facilitations

The amount Ms. Anthony talked decreased over the course of four Collaborative Reasoning Discussions. Figure 4 shows a comparison of teacher speaking turns and instructional moves. Gradually, her speaking turns lessened; and she utilized her talking time for effective instructional moves. Although she still faced struggles, such as dealing with student behaviors, students increasingly became more independent.
In Collaborative Reasoning Discussion 2, as shown in Figure 5, Ms. Anthony utilized the most instructional moves, such as prompting, reminding, and asking for clarification. Because students were new to the format, they were easily distracted from the main question, did not connect their ideas, and still talked to the teacher instead of to the group. Several group members avoided taking positions by proposing other alternatives. For example, because students felt bad for the fox and did not want to cause harm to Dr. De Soto, they suggested the fox go to other dentists. Even though Ms. Anthony struggled navigating the discussion, she was able to elicit critical reflections from students, such as Lisa and Daisy.

<table>
<thead>
<tr>
<th>Ms. Anthony</th>
<th>CR 2</th>
<th>CR 4</th>
<th>CR 5</th>
<th>CR 7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the discussion</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Prompts</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Encourages</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Clarifies</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Challenges</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reminds</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Thinks out-loud</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Fosters independence</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sums-up</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Debriefs</td>
<td>5</td>
<td>3</td>
<td>10</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>14</td>
<td>18</td>
<td>13</td>
<td>71</td>
</tr>
</tbody>
</table>
In Collaborative Reasoning Discussion 4, Ms. Anthony used numerous *prompts* as shown in Figure 5. Several students did not elaborate on their reasoning while others lacked evidence to support their reasoning. Although the reasoning part of discussion seemed challenging, a few students, such as Lisa and Michael, started to be more active in navigating the discussion. Lisa was particularly active, contributing, correcting as well as prompting for reasoning. However, her active manner created tension. During reflection, Lisa shared constructive feedback with the group. Despite the tension that seemed to upset her, she reminded the group that her disagreement with Eric was not personal. She genuinely wanted to listen to Eric’s reasoning.

In Collaborative Reasoning Discussion 5, instructional moves during the discussion lessened. Although interruptions from other students were still an issue, students talked more to each other. For example, for the most part, students were able to express reasoning supported by their personal experience and evidence from the text. During *debriefing*, Ms. Anthony appreciated the critical thinking progress. She also provided suggestions to collaboratively solve some behavioral issues, such as how to encourage other members to participate and how not to interrupt.

In Collaborative Reasoning Discussion 7, Ms. Anthony only needed to minimally refocus students as they became more independent and were connected with each others’ ideas. Lisa was particularly showing the most progress. Her active manner almost mimicked teacher instructional moves, such as encouraging other members to speak, asking for clarification, and reminding others to stay on topic. She was also able to
prompt another student’s reasoning and acknowledge his strength that made her change position.

All in all, instructional moves lessened as students in Group 1 became more independent during discussions. In the beginning, Ms. Anthony utilized almost all types of instructional moves to help students improve their social and reasoning skills. In the end, she only utilized a few. At least one student, Lisa, gradually adopted a teacher role as she practiced prompting for reasoning, encouraging equal participation, providing feedback, and reminding others about discussion norms.

**Ms. Anthony’s Collaborative Reasoning Discussion 2 – Should Dr. De Soto let the fox in?**

The story for the 2nd discussion is about Dr. De Soto, a mouse dentist who takes care of a fox with a toothache. Students discussed the main question: Should Dr. De Soto let the fox in again? Students considered that during the first treatment, while on anesthetic, the fox comments how he loved eating mice. The discussion lasted for 27 minutes that included 5 minutes *setting the discussion* and 8 minutes *summing-up* and *debriefing*.

Ms. Anthony began by reiterating ground rules for discussion, such as talking among each other and not only to the teacher, listening and encouraging everyone to participate, and being mindful when disagreeing. During discussion, she utilized various instructional moves, such as *prompts, clarifies, encourages, reminds, thinks out-loud, and foster independence*. Several examples are as follows. She prompted when students did not connect evidence to their position (“*And how does that evidence support your position?*”). She asked for clarification where in the text a student cited an evidence (*Where's 'right here.' Emily? So everyone can...; Sarah, where's 'here'?*). She also
reminded students to focus on the main question throughout the discussion (*Can someone remind me of what the main, big question that we're focusing on here?*; *Ok. Should the Desotos let the fox in again? So how, tell me how do the cars and the roads have anything to do with that?*).

Ms. Anthony attempted to refocus the discussion with little success at first. Although students stated their position in the beginning, their discussion revolved around alternative solutions, such as going to another dentist. Ms. Anthony tried a few times to refocus the discussion as shown below. She pointed out that student did not address the main question to let the fox in or not. However, her intervention directed students to further explore the alternative solution, such as to find another dentist.

**Ms. Anthony:** You guys are sharing an alternative viewpoint, an alternative position, so instead of 'yes' or 'no,' that the fox isn't going to get his tooth worked on if he doesn't go back to Dr. Desoto. Your alternative position is that he could just go to a whole new dentist. Right? What do you guys think about that?

**Cathy:** Ummm. I don't think that he would go to Dr. Desoto's dentist if there was any other one that he could have gone to instead.

**Eric:** These are mice [NV-points to papers]

**Sarah:** Yeah, and um, that one might have been easier to go to?

**Lisa:** Ok. Well, Mr. uh, there are um, there are other dentists. You might have to go far away, but he could always go to a, there might be another dentist in town it's just Dr. Desoto is really good, that's why a lot of people go to him.

**Sarah:** Yeah, and he is really popular with big animals, it says. Because his drill is so tiny.

Near the end of the discussion, she tried again to refocus to the main question as shown below. Several students below answered her with a position, but several others did not express their final position.

**Ms. Anthony:** We can't assume, because the text doesn't tell us, we can't assume in this discussion that there are other dentists. So we need to focus
on the main question at hand, right now, which is, um, coming back is, "should he let him back in, or not?"

**Eric**: Yessss?

**Sarah**: I don't think they should let him back in because it could be too dangerous.

**Eric**: I think yes, because um, like Cathy said, you can't just help someone once, and then...

**Cathy**: And then just make them go somewhere else. 'Cause that would just be really, um, rude and mean.

**Greyson**: You have to get the job done.

**Cathy**: And what if there's no other place, uh, no other dentists for him to go?

During *debriefing*, Ms. Anthony spent some time to applaud students’ performance. She appreciated that students talked to each other and did not look at her as much compared to the previous discussion. They also incorporated evidence from text.

When prompted, Lisa and Daisy also offered feedback for the group to work on the next discussion as shown below. Lisa expressed the lack of connection of each other’s ideas; and Daisy expressed about being off topic.

*Um, I was gonna say to listen to the uh, it was the, talk among, no, it was listen to everyone's ideas. Because I felt like some people, they were like, not REALLY listening, they weren't like- like they would say, sometimes they would say, they would float off to a different idea, instead of saying, "but I think..." or "my opinion is..." and saying something... (Lisa)*

*I also think we should stay on topic, because at one point we started talking about animals driving cars, and how that was not possible. (Daisy)*

**Ms. Anthony’s Collaborative Reasoning Discussion 4 – Verdict to the Wapiti sow Bear**

While the story for the 2nd discussion contains a moral dilemma, the story for the 4th discussion includes a policy issue. Students were tasked to discuss whether a policy related to death verdict of a bear should change. As endangered and protected, yet dangerous animals, the law states that bears that kill and eat its victim is guilty. One bear,
the Wapiti sow, killed two hikers within a short time. The bear was once freed, but the second time, she was guilty and killed by a ranger. The discussion lasted for 18 minutes which included 2 minutes setting the discussion and 3 minutes for debriefing.

During discussion, prompting was the main instructional move. Several examples are as follows. Ms. Anthony prompted students to provide more reasons (Ian, why? Give us some more reasons); asked which evidence from text that students referred to (Do we have evidence that this happens? Do we have evidence that...); and invited a student who were not participating (Cathy, do you know?). Lisa started to appear as an active member. In the beginning she helped Eric understanding the text that there were two people killed instead of one. Later on, she asked him the reason why he thought the Wapiti sow should be kept alive. However, her active manner created a tension as displays in the following excerpt.

Ian : Uhh, let.. [NV-points to Eric]
Eric : Uh, he could have shot that gun that uh, puts them to sleep //
Cathy : A dart!
Eric : A dart, yes. And they like, put them in a really protective cage. Like, really expensive. And so, it could see humans, but it couldn't get at them. So...
Cathy : But, but, if people knew that the wapiti sow was still alive, they'd probably, um, like it says in the text, just shoot any bear they saw. Which would rapidly//
Cahston : Um, can you let Michael speak?
Cathy : Which would rapidly (decrease) the bears.
Michael : Oh! Ok! Now I found it. So it said that the bear (justice), so, the human eating bear could develop a taste for people and kill again. But it says that no scientific data exists to support that idea.
Eric : Yeah.
Lisa : But the rangers feel this way because //
Cathy : Because it could happen.
Lisa : Yeah, and, um, and, the rangers feel this way because, um, the wapiti sow, um, it can't...
Michael : How do you know how they feel?
Lisa : Because it says in the text!
Ms. : It's ok...
Anthony
Lisa : And uh,
Ms. Anthony : Hey, there is one ground rule that I forgot to mention. Remember we're not attacking people, we're just talking about ideas. Different opinions.. Right? So they're not.. [1] It's ok. You don't need to interrupt people to let them know that. He'll get there. He just brought up a great point. So.. and Lisa is bringing up a great point, too. This might be true. The rangers might feel that way. Could they risk.. Do they want to risk it?
Ian : [1] I just feel like Michael's not speaking..

The above excerpt illustrated how Ms. Anthony came to remind students of one ground rule: to disagree with ideas, not with person. When a few students talked over each other, Ian attempted to let Michael speak. Meanwhile, Lisa still continued speaking with other students’ interruptions. While she was trying to express her point, Michael raised his tone and asked Lisa how she knew about the ranger’s feeling, which was actually stated in the text. Lisa became upset and was about to cry.

Although Ms. Anthony missed summing-up students’ final position, she spent a few minutes for debriefing. Ms. Anthony initiated with a question to the group how the discussion went. Surprisingly, students reflected with less direction. Lisa and Ian gave a specific rating (such as 3.5 out of 5). They expressed that there were students who interrupted and students who talked much more than others. Lisa also stated her on point observation: even though the group still talk over each other instead of connecting ideas, everyone disagreed respectfully, and did not attack each other personally as the following excerpt illustrates.

Yeah, and so, um, and so, and I felt like people were interrupting each other so they could get a fair chance to talk, and, but I felt like we weren't addressing each other by 'them,' we were addressing each other by their ideas, and weren't like, um, Ian, Cathy, and I, we weren't, I like, we weren't targeting Michael and Eric, we weren't targeting them, we were um, we respectfully disagreed with their ideas, not them, their ideas.
Ms. Anthony closed the discussion by appreciating everyone’s participation especially Lisa’s contribution. She also encouraged other students to participate. She reminds the group that criticism is not personal attack, but essential feedback to improve reasoning or behavior during discussion.

Ms. Anthony’s Collaborative Reasoning Discussion 5 – A Coat for Mr. Snowman

The story for the 5th Collaborative Reasoning discussion is a scientific story: “A Coat for Mr. Snowman”. The characters in the story talked about whether putting a coat on the snowman prevents it from melting. The discussion lasted for 18 minutes with 3 minutes setting the discussion and 3 minutes summing-up and debriefing.

Before the discussion started Ms. Anthony was disrupted by students side conversations. Sarah and Michael already thought that putting a coat on a snowman is a pointless idea while joking with each other. Adding to the conversation, Eric disagreed and said putting a coat on a snowman is a cool idea. Ms. Anthony then quickly went over the ground rules so the discussion could start. She reminded students not to raise hands, to give everyone opportunity to speak, and to talk to each other and not just look at the teacher.

Initially several students focused on counting which student was on which side. For example, Sarah counted when Linda changed position to her side. Because Sarah and Michael talked more than other students, Ms. Anthony initiated several prompts. She invited other students to participate. She also went back to students who mentioned their positions earlier, but did not have opportunity to elaborate their reasoning. For example, when three of the six students dominated the discussion, Ms. Anthony turned to another student, “Eric, you said it would keep the snowman cold?” When Eric started to
contribute more, she invited another student by asking similar question (So, Inara, you're saying that the coat would keep the snowman cold?). Finally, she reminded the group about equal participation in order to invite Cathy, who participated the least. As shown below, her prompts were successful to invite everyone’s participation and reminded dominating students to give other members opportunity to speak. However, the exchanges were quickly held by dominating students again. Cathy only spoke again near the end when the discussion had concluded.

Ms. Anthony: One of the goals of our collaborative reasoning ground rules is that we make sure that everyone's had a chance to speak. I wonder if there's any encouraging...


Cathy: Um. I don't think that they should put the coat on the snowman, because um, like Linda said, or maybe, I can't remember which one it was.. Um. It would melt, it would um. If it froze it, it might keep the, um, body warm, but the head would just melt off.

Linda: Yeah, and then it would not be much of a snowman anymore, and it would have no purpose, to be on the snowman.

During debriefing, Ms. Anthony asked several questions for reflection. She went to each student asking what they thought, such as related to interruptions, raising hands, and connecting to each other ideas. They responded with aspects they needed to work on, such as encouraging equal participation, staying on topic, and listening to avoid interruptions. She further appreciated that students incorporated personal experiences as well as evidence cited from the text to support their reasoning. Students also expressed things they did well. For example, they talked to each other, not only to the teacher.

Ms. Anthony’s Collaborative Reasoning Discussion 7 – A Permit to Climb
In the 7th Collaborative Reasoning discussion, the group read a story containing a policy issue, “Permit to Climb Mount Everest”. Tyler, a 6th grader, was denied a permit to climb Mount Everest due to age despite his achievement reaching 3 out to the world’s Seven Summits. The students discussed if the policy should change and he should be allowed to climb. The discussion lasted for 19 minutes included around one minute setting the discussion and 4 minutes summing-up and debriefing.

This time, Ms. Anthony did not elaborate on the ground rules and went straight to asking students their initial position. Compared to other previously discussed sessions, Ms. Anthony utilized the least instructional moves, such as prompts, clarifies, and reminds. When students shifted their discussion to unrelated topic, Ms. Anthony brought students back the main question.

Let me bring you back to the question. The question is: Should he be permitted to climb, or not? So your job is to state your position with reasons, your personal reasons. "Because," and...

Overall, students seemed to be more independent in navigating their turn-taking. They were also more comfortable changing their positions after listening to others’ ideas. Lisa was particularly active in directing the discussion. She invited other members to participate ([NV-giggles] You can go, Michael!), asked for clarification (And it is dangerous, you're right Ms. Anthony. Is that one of the reasons why you think he shouldn't do it? [NV-looks at Eric]) and reminded the group to stay on topic (Stay on topic guys.). The following excerpts further illustrate how she prompted other students for reasoning and in the end acknowledged him for changing her opinion.

Um. Well, Eric, we haven't- I guess--... but we haven't really heard a lot of reasons why you think they shouldn't let him have a permit? Yeah, I just kind of want to know why. Some other reasons.
You don't? Then I guess they shouldn't give him the permit if he's trying to climb all the way. So Eric, I guess you did kind of help me change my opinion.

During debriefing, Ms. Anderson showed tally marks from students’ speaking turns. She praised Lisa for asking Eric to support his opinion with reasons. Lisa, aware of tension she might have created, explained that she was not trying to force him to talk. She pointed out that she genuinely wanted to know the reason why Eric thought Tyler should not climb the mountain as presented below.

People were saying "I think he should get a permit." I guess I was only hearing from them, and Eric was kind of- Well, I'm not saying Eric was thinking this- I feel like Eric might have been thinking, "Ok. Um. There- I'm just gonna think- I'm gonna feel oppositely." And I just wanted to know WHY he did.

Ms. Janek’s Facilitations

Ms. Janek was an active facilitator and gradually became confident with her facilitations. She also learned to reduce some of her control. She utilized numerous instructional moves and was actively involved in pre-discussion, during discussion, and post-discussion activities as Figure 7 shows. As she felt more certain, she tried experimenting with other aspects of discussion, such as seating positions during setting the discussions and asking students to praised each other during debriefing. At times, her active teaching style temporarily halted students’ participation. However, students adopted her manner as they showed more willingness to change opinion given sufficient reasoning. Although her teacher speaking turns lessened, she was still a bit dominant in navigating student discussions.
In Collaborative Reasoning Discussion 2, Ms. Janek applied numerous instructional moves, such as *prompts, encourages, clarifies, thinks out-loud, and fosters independence*. For example, she redirected when students started to talk only to her; praised when a student posed a good question; and summed-up student positions throughout the discussion. Ms. Janek also spent more time in the end for reflection. She appreciated student use of reasoning with evidence, not raising hands, and there was no right or wrong answer. She also asked further questions for students who changed position in the end.

<table>
<thead>
<tr>
<th>Ms. Janek</th>
<th>CR 2</th>
<th>CR 4</th>
<th>CR 5</th>
<th>CR 7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the discussion</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Prompts</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Encourages</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Clarifies</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Challenges</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Reminds</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thinks Out-Loud</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Foster Independence</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sums-up</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Debriefs</td>
<td>7</td>
<td>11</td>
<td>8</td>
<td>13</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>25</td>
<td>19</td>
<td>27</td>
<td>90</td>
</tr>
</tbody>
</table>
Figure 7. Ms. Janek’s Instructional Moves

In Collaborative Reasoning Discussion 4, Ms. Janek utilized *prompts, encourages, and clarifies.* She prompted several students to participate more and asked for clarification when a student just said, “I agree” without elaboration. Overall, students were able to exchange ideas, incorporating reasoning and evidence from text. They also attempted to use expressions to connect ideas, such as “I challenged that”, “I disagree”, and “I agree with…” Except, Sally, a new member who despite encouragement from Mandy and Ms. Janek, seemed reluctant to participate.

In Collaborative Reasoning Discussion 5, Ms. Janek struggled to balance a one-sided discussion. Ms. Janek sat away from the discussion table so students would look at her less. She applied instructional moves, such as *prompts, encourages, clarifies,* and *challenges.* For the first time, all students argued for the same position. Ms. Janek then presented an opposite view to balance the discussion. However, students were firm on their reasoning and supporting evidence. In addition, Sally was still reluctant to participate and only spoke when asked despite other students and Ms. Janek’s encouragement.

In Collaborative Reasoning Discussion 7, Ms. Janek incorporated *prompts, clarifies, challenges,* and *fosters independence.* Students again held the same position. At first, Ms. Janek attempted to challenge students to think about another perspective. Mandy also tried to invite other members to think about an opposing view. However, none of the students responded to their attempts.
Over the course of these 4 discussions, Ms. Janek was an active facilitator. She prompted, reminded, and clarified, when students were just learning how to support their position with reasoning and evidence. She attempted to challenge when students held the same position. She also built a positive environment through a variety of encouraging techniques during and post-discussion.

Ms. Janek’s Collaborative Reasoning Discussion 2 – Should Dr. De Soto let the fox in?

Due to technical issues, the 2nd group discussion’s recording transcript only captured the last 11 minutes when students were already in the middle the discussion. Facilitating Dr. De Soto’s story, Ms. Janek employed a number of instructional moves, such as prompting, encouraging, asking for clarification, thinking out-loud, and fostering independence. She also spent more time in the end for reflection.

Several of Ms. Janek’s instructional moves are as follows. Besides praising students (Oh, you have some good questions to think about!), Ms. Janek was active in following up students’ responses when their speaking was not clear. She asked students, “So what does that have to do with--I don't understand why that matters. Will you tell me what you're thinking?” when a student tried to explain something that seemed unrelated. She also asked for clarification when a student was not clear with their words, “What do you mean, back down? Be clearer with your words.” She checked in with students several times throughout discussion if she noticed any change in students’ position, “So has your position changed a little bit, Mandy, from what you've heard? [1] So you've basically gone from a thumbs down to a thumbs up? Um, has anyone else's position changed?”. Finally, she kept redirecting students back to the group when they started to
speak only to her. She mentioned, “[NV-[points to Mandy] Tell her, tell her” and “[to Derek] Listen, listen--tell him.”

During summing-up and debriefing, Ms. Janek asked several questions to help students reflect on their discussion. She asked whether students have changed their positions and which reasoning made them changed as illustrated in the excerpt below. Although students were still vague why they changed positions, it seemed that they were comfortable to acknowledge each other’s perspectives.

Ms. Janek: Does anybody here feel like their position changed a little bit, or did it just solidify what you thought in the first place? Are you still like there's no way I would let that fox back in if I was Dr. DeSoto? [3] Or would you--did you change? You changed?

Christopher: [3] I'm kind of--I changed a tiny bit, so I'm like //

Ms. Janek: // And what part changed? Can you tell me what part changed for you?

Christopher: Um, just hearing all their reasons.

Ms. Janek: Was there a particular reason that really made you think?

Christopher: Um, no, not necessarily. No, I don't really think so.

Ms. Janek: Mhmm. There wasn't a particular one? How about //

Mandy: // Like, I changed but [1] then I, like, heard all these good ideas [2]--well, down again, I'm back to down because I heard these guys with really good ideas. I thought they had really good ideas, but there was--I think there was more evidence to back up that it was, that--that, um, that it was, um, that they shouldn't let him in [3] because there were, like, a lot more reasons.

Ms. Janek’s Collaborative Reasoning Discussion 4 – Verdict to the Wapiti sow Bear

The 4th Collaborative Reasoning discussion lasted for 24 minutes included around 1 minute setting the discussion and around 5 minutes summing-up and debriefing. Ms. Janek started by asking students their initial position. During discussion, she incorporated instructional moves, such as prompting, encouraging, and asking for clarification. She also actively directed students during pre-discussion and post-discussion activities.
As shown below, discussing about the death verdict of the Wapiti sow Bear, students were able to exchange ideas supported by evidence from the text. Students also utilized expressions, such as “I challenge that.”, “I disagree.”, and “I agree”. Ms. Janek minimally asked for clarification.

Peter : Oh okay thank you. Um, I think they should put the bear down since um on the back it says that the bears may develop a taste for humans or they could kill other bears and then that would probably hurt the population of bears.

Jasmine : I challenge that, because it says that there's no scientific evidence that the bears would develop a taste for humans. They might not. They might--they might just eat once and then never do it again.

Peter : [NV-nods head] Oh yeah, that's true.

Mandy : I agree, and I think //

Ms. Janek : // What do you agree with?

Mandy : Uh, Jasmine, because I think they shouldn't have killed the bears. I bet--I bet the mom was trying to protect her cubs, and why would you have to kill a bear if it didn't do anything to you? Because it says the bear did wound the person and the fingerprints did say it was the Wapiti sow, but it also, um, said that there were fewer, um, than one thousand three hundred grizzlies in the United States.

Derek : I disagree because if you're killing one grizzly, how--that wouldn't hurt because there, there's, there could a hundred--another thousand, maybe, five hundred cubs and they'll--soon they'll grow up and they'll be more than just one, like, there'll be more cubs than one killed.

Jasmine : I challenge that. If you kill the mother, then the cubs are left in captivity so that makes instead of just one less bear, it makes a few less bears since the cubs get taken from their wild habitat.

Students also made more effort to include Sally. Soon after everyone started stating their reasoning, Mandy noticed she had not participated yet. The following excerpt shows when Mandy invited Sally to talk. Throughout the discussion, she invited Sally three times and asked other students to stop when looked like she had something to say.

Mandy : [1] Guys, maybe we should let Sally talk. [1]
Mandy : Sally, what do you think?
Sally : Mm, I think they should have put down //
Ms. Janek : Honey, I can't hear you please.
Sally : Um, I think they should have put down the bears because um it's people would still be shooting the bears if they saw them cause they could still be doing that and that would make the bear population go down and //

In the end of the discussion, Ms. Janek praised Sally’s participation. However, she seemed not yet comfortable being in the group. For example, she only nodded, turned away from the table, or looked under the chair. After summing-up to check students’ final position, Ms. Janek debriefed to reflect on what students thought of their discussion. Students all agreed that they enjoyed the discussion. They expressed that they agreed and disagreed in a friendly manner. Mandy followed-up by asking if anyone felt left out. Ms. Janek praised her as she was also the one who invited the Sally to participate.

Ms. Janek’s Collaborative Reasoning Discussion 5 – A Coat for Mr. Snowman

The 5th Collaborative Reasoning discussion lasted for 20 minutes included around 1 minute for setting discussion and 5 minutes summing-up and debriefing. When setting the discussion, Ms. Janek asked Sally about her goal as she was quiet during the previous discussion. She then asked other students to state their initial position. This time, she purposefully sat a bit further from the table.

Facilitating the story, A Coat for Mr. Snowman, Ms. Janek utilized instructional moves, such as prompting, encouraging, asking for clarification, and challenging. She was surprised that everyone was on the same position: putting a coat will not prevent the snowman from melting. She prompted students to discuss their reasoning (**Oh my**
goodness. Wow. Everybody has the position that they should not put the coat on the snowman. Okay. Alrighty. So, um, how about we just start to talk about why.) Halfway through, as students still in the same position, Ms. Janek asked students to think about the opposite view. The excerpt below shows student supported their reasoning with evidence from personal experience. Despite presented with a different view cited from the text, student were firm with on their original position.

**Ms. Janek** : Well, so you-- I'm just challenging here. So do you feel like the coat in itself is the thing that keeps you warm, or Dantrelle says, they're a wall for heat. Coats don't let the heat from people leave into the air, so that's why you're warm, 'cause your body is making--talk about that.

**Jasmine** : When I bought my winter coat, I was looking at this tag, and it had, like, this thing, it was like a scientific something, and it showed that, so there's a little sparkle, like, stuff on the inside of my coat, and it basically lets the heat go through and then traps the cold and pushes it back, and traps the heat and lets it stay inside the coat.

**Mandy** : Um, I heard that [1] coat also takes [1] all the um heat away from you and puts it in the coat itself so it can warm you up, so I don't think, I don't think it would really, I think it would melt the snowman because, um, well I guess he doesn't have any heat in him, but it'd still probably melt uh him because he's //

**Derek** : [1] Yeah, like the// [1]

**Ms. Janek** : // Boy, I really like what you're saying. I really liked hearing what you said, because that makes me think. Could you say that again, though?

Overall, the discussion revolved around one position: that the coat will not prevent the snowman from melting. Although all students participated, Sally still did not contribute to discussion. Jasmine asked if she wanted to share with the group; however, she refused. Sally finally talked only after Ms. Janek asked her to. During debriefing, Ms. Janek created different post-discussion activities. She asked students to praise each other’s performance during discussion. Students responded with stating what everyone
did well. The group, especially Jasmine and Mandy, complimented Sally for her participation.

Ms. Janek: Okay, so I have to ask you, um, let's--let's--good job, you guys, give yourself a hand. Nice work. And, hey, I have this to ask. I'd like you to go around and tell me, um, maybe this time, instead of really talking about how we did ourselves, do you have a put-up for a friend? Something that you noticed that they did that, um, you thought it was very worthwhile? I would love to start if you don't mind, I just have to give Mandy a put-up. I loved the way she considered Dantrelle, what he said, and what coats--I was very impressed. You were saying it so quietly, but man, you made me think. Thank you.

Mandy: Thank you!

Ms. Janek: Oh, she did use her schema, didn't she?

Jasmine: And kinda, she took what Dantrelle thought--it was kind of like she challenged, it kind of felt like she was challenging her own thinking.

Ms. Janek: Oh, did you catch onto that, anybody else?

Christopher: [NV-nods head yes] Mhmm.

Mandy: Um, well I have a compliment. I think the whole group, um, did a great job because this--I don't think this page gives us as much evidence as our other book kinda does so far [1] so, I think we all did [1] a great job.

The end of the discussion, Ms. Janek and the group reflected on Sally’s lack of participation. Ms. Janek turned to Sally and asked her to share more because other students have also encouraged her join in. While Christopher mentioned that Sally should contribute something that others had not said, Jasmine and Mandy continued complimented her although she was not speaking much.

Ms. Janek’s Collaborative Reasoning Discussion 7 – A Permit to Climb

In the 7th Collaborative Reasoning discussion, the group talked about the story of Tyler who was denied permit to climb Mount Everest. Students considered whether the policy should change and he should be allowed to climb the mountain. The discussion
lasted for 18 minutes with around 2 minutes in the beginning setting the discussion and 4 minutes in the end summing-up students’ final position and debriefing.

Ms. Janek set the discussion by asking students the goals they set in the previous discussion. She reminded students to encourage everyone’s participation; as well as cite the text for evidence to support their reasoning. Besides setting the goal, Ms. Janek also experimented with students seating position.

During this discussion, Ms. Janek utilized several instructional moves, such as prompting, asking for clarification, challenging, and fostering independence. Similar to the 5th discussion, everyone was in the same position. Students agreed that Tyler should be allowed to climb. The excerpt below shows Ms. Janek attempted to challenge students to think of the opposite view. However, students did not respond to her counter argument:

Ms. Janek: Does anybody have--I feel like listening to you, you all are still very set on your positions, correct? [1] Can I--can I throw something out there for you? Isn't it now against the law?

Christopher: [1] And he's even climbed.

Peter: Well--oh yeah, to climb...

Derek: Yeah, but they said.

Christopher: He could be in, like, really good fitness.

Ms. Janek: Just talk to each other about that.

Derek: They said that he has to be in, like, really good shape and he really healthy, and he has to be, know what he's doing and he has to have people climbing with him.

Near the end of the discussion, Mandy also attempted to ask the group to think about the opposite view, such as reasons why Tyler should not climb. The excerpt below shows her attempt; however, again other students did not respond to her idea. They were closing their final statement and still think Tyler should be allowed to climb.

Mandy: Um, I have, like, a question for all of us. Maybe we could say, like, if there was any reason why that he couldn't climb the
mountain. I think that would be a good, like, question to ask.

Jason: Christopher?

Christopher: Uh, I'm Christopher and I still think that he should be allowed to climb the mountain because, uh, he's trained and climbed the second highest one and he has multiple people going with him.

Jasmine: Um, I'm Jasmine and I still remain with my position that he should be allowed to climb the mountain because he's ready and he's trying to work on a goal and they should let him—they should let him be able to, um, make the goal a reality, his dream a reality.

After checking students’ final position, Ms. Janek asked students several questions related to their behaviors and reasoning. Ms. Janek asked whether students gave equal opportunity to speak and whether any students talked more than others. She also asked students to reflect back on the evidence that they had cited from the story to support their reasoning and position. Students seemed to enjoy the story and pleased with their discussion performance.

Ms. Logan’s Facilitations

Ms. Logan’s facilitation over the course of 4 Collaborative Reasoning Discussions revolved around refocusing student discussions. Her speaking turns lessened, but her instructional moves remained limited to prompting and reminding. She also spent the least amount of time setting the discussion and debriefing. Student behavioral issues remained challenging as dominating students tried to defend their positions and limited speaking opportunities for other students with opposite opinions. Although she did intervene, students with opposite opinions were unable to explore their arguments due to interruptions from dominating students.
In Collaborative Reasoning Discussion 2, Ms. Logan minimally incorporated instructional moves, such as prompting and reminding. Students seemed active and equally participated; however their speaking turns were monologues of their arguments instead of responses to other ideas. Students were also easily distracted by creating alternative solutions and talked about unrelated topics. When students were off-topic, Ms. Logan commented, but did not direct students back to the main question.

<table>
<thead>
<tr>
<th>Ms. Logan</th>
<th>CR 2</th>
<th>CR 4</th>
<th>CR 5</th>
<th>CR 7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the discussion</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Prompts</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Encourages</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Clarifies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Challenges</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reminds</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Thinks out-loud</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fosters independence</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sums-up</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Debriefs</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>11</td>
<td>47</td>
</tr>
</tbody>
</table>

*Figure 8. Ms. Logan’s Teachers’ Talk and Instructional Moves*
In Collaborative Reasoning Discussion 4, Ms. Logan attempted to utilize more *prompting* and *reminding* as students still struggled to stay on topic. She tried to refocus the discussion, but had little success because she waited longer to do so. Several issues that disrupt the discussion were as follows: students misunderstood the story content; dominating students tended to talk about unrelated topics; and there was a lack of connecting evidence to reasoning.

In Collaborative Reasoning Discussion 5, Ms. Logan tried to refocus students early in the discussion. Although her instructional moves were limited to *prompts* and *reminds*, she finally was able to help students stay on topic after several attempts. Several students began to show more independence in navigating the discussion, by inviting other members to participate and praising each other; however, Johnny, a new member did not participate. Both students and Ms. Logan did not attempt to ask him to participate. However, at the end of the discussion, Ms. Logan praised other students for their effort to encourage Johnny.

In Collaborative Reasoning Discussion 7, instructional moves were still limited to *prompting* and *reminding* as students continued struggling to focus on the main question. Dominating students still caused issues. They allowed only a few opportunities for other students with different views to express their arguments. Although Ms. Logan was able to help these students, their arguments were not developed due to constant interruptions from dominating students.

Ms. Logan mostly incorporated *prompts* and *reminds* although students could use more support from her. Her hands-off nature might have contributed to the group’s limited development of social and reasoning skills. Until the end, several students still
treated discussion as an opportunity to defend their position instead of a time to share ideas and be open to change when reasoned argument allows.

Ms. Logan’s Collaborative Reasoning Discussion 2 – Should Dr. De Soto let the fox in?

The 2nd group discussion lasted for 26 minutes that included 4 minutes setting the discussion and 2 minutes summing-up and debriefing. Setting the discussion, Ms. Logan showed a chart of an argument house although did not spend time to elaborate it. She also asked students to read aloud the ground rules, such as listen carefully to everyone’s idea, speak without raising hands, talk to each other instead of to the teacher, think about ideas rather than who said them, and use evidence from text and from their schema to support their reasoning.

During discussion, Ms. Logan applied several instructional moves. She utilized prompts, reminds, and encourages. For example, she prompted when students cited an evidence from text, but did not connect to her reasoning (So what do you think?). She reminded students to cite evidence from the story (Kay so did everybody so remember you need evidence from the text so keep going). She further repeated a basic rule: no voting during discussion and encourage student with a minority view. After exchanging ideas for some time, a student asked “Are we allowed to do a vote?”, which Ms. Logan replied “Well we're not gonna vote cause we don't have to-- we don't all have to agree and it's not like there's a winning side!”. She also praised one of the students who was in minority position, “It's okay, Sandy! Okay to be the uh bucking the trend. I think that's probably what you'll do a lot in your life.”
While students seemed actively engaged and equally participated, their discussion was not focused on the big question whether Dr. De Soto should let the fox in again. Several of their engagement were monologues of their own position; and students minimally responded to each others ideas. They were also talked about alternative solution (why couldn't he go to another dentist?) and talked about unrelated subjects (Yeah he probably doesn't brush his teeth or floss or use mouthwash, to which another student replied Well um actually most dogs don't needa brush their teeth cause they have a special chemical in their mouth). When students were off topic, Ms. Logan made further comments, but did not direct students back to the main discussion as the following excerpt shows:

Melanie: And like Dr. DeSoto is so subpi- suspicious that he's even washing his hands. You don't really see him with the other patients washing his hands um for the other animals so

Ms. Logan: Would you want- would you want to go to a dentist that [1][1] put their hands in your mouth but they didn't wash their hands?

George: [1] Didn't wash his hands [1]

Students: No!

Students: Inaudible chatter among students and Ms. Logan

Jacob: I think he was wearing gloves or something as well

Ms. Logan: Even still they they still wash their hands before they put the gloves on

Jacob: Yeah

During debriefing, students expressed that they enjoyed the discussion. Several students mentioned that everyone participated and that there were no “real arguing”. One of the students added a minor criticism where they still talked over each other. Ms. Logan ended the session praising students’ active engagement as well as the group’s positive manner towards Meta, who held a minority position.
Ms. Logan’s Collaborative Reasoning Discussion 4 – Verdict of the Wapiti sow Bear

In the 4th group discussion, students discussed a problematic policy of the death verdict of the Wapiti sow bear. The discussion lasted for 21 minutes that included around 2 minutes setting the discussion in the beginning and another 2 minutes summing-up and debriefing in the end. Ms. Logan began with reading the ground rules to students, and later during discussion, utilized more prompts and reminds. Similar to the 2nd group discussion, all group members were actively participated during discussion although there were still several off-topic exchanges.

The group spent almost half of the discussion time to defend the cub although the text was about verdict to the bear. Half through the discussion, Danny finally pointed out the verdict was not about the cub. Then, the discussion shifted to off-topic conversations about what bears eat and what happens when they die. Some of the group members tried to bring other students back to the text. However, a particularly dominating student seemed only eager to respond to unrelated topics. Finally, Ms. Logan tried to bring students back to the topic, but students were quickly distracted again.

Several pertinent issues were student still needed prompting to cite evidence from the text because they went off-topic easily. When they found evidence from the text, they did not naturally connect it to reasoning. The excerpt below shows that although Danny finally cited evidence from the text with the teacher’s prompt, he still did not connect his evidence to his reasoning.

Danny : [1] And also people take their guns. They see a random bear and they’re like, "that maybe a, uh, thirsty blood killer." Bam! They shoot it. [2] It's gone. [2]

Jacob : [2] They think it's-

Ms. Logan : Okay, but we're talking about this page.

Danny : I know, but it did say that it's protecting, because other people
might shoot other bears.

Ms. Logan : Well, that is true.
Jacob : Yeah, if it- if it still kept attacking humans, they'd think every grizzly would be bad. Like it says in the text and they would probably think that just all other animals are better than bears.
Sandy : Well- // [1]
Ms. Logan : [1] What evidence is there in the text that does ???.
Jacob : Um...
Danny : There is evidence that says-
Sandy : Well- [1]
Melanie : [1] Um, so...
Ms. Logan : What is it- what evidence is in the text that says that there aren't random bears going out and mowing people down?
Danny : Well, it does say- fr- uh, "frightened people might be more likely to shoot a grizzly they saw, even a bear that posed no threat." So that does make the point that other people might think that it just might be one bear, but they don't know and if they try to see it, it could be and they have a chance of getting killed. Like, they may lose their gun. It- it- it can happen. And then the bear might kill it. And if they shoot it straight away, they won't know. Either it's a bad bear or a good bear. You've got a 75% chance it's a good bear and a 25% chance it's a bad bear. There aren't many bear kills 'cuz it does say, "there haven't been a grizzly related death in Yellowstone for more than twenty-five years." This is only Yellowstone.

At the end of the discussion, Ms. Logan shortly asked students’ final positions.

She praised students for being active and talking not only to her, but also to each other.

The group made several goals for the next discussion, such as not interrupting when other people speak and staying on the subject.

**Ms. Logan’s Collaborative Reasoning Discussion 5 – A Coat for Mr. Snowman**

During the 5th group discussion, the group discussed whether putting a coat on a snowman will prevent it from melting. The discussion lasted for 15 minutes that included 1 minute *setting the discussion* in the beginning and 1 minute *summing-up* and *debriefing*. Similar to the 4th group discussion, Ms. Logan utilized a few instructional moves, such as *prompts* and *reminds*. 

97
Unlike the usual, Ms. Logan did not go through the ground rules and directly asked students their initial positions. During discussion, she tried to refocus the discussion several times. Compared to the 4th group discussion, this time she intervened early. The following excerpt shows Ms. Logan’s attempts to bring students back to the main question. On the third attempt, she succeeded.

Ms. Logan: Okay, so, sorry, I think we're getting a little bit away from the point here. The question is: is the coat - should they put a coat on the snow person. Now, the snow person is a real thing, it's not alive, but it is a real thing. So it's possible to put a coat around it and that's the question we're trying to answer here.

Jacob: Well- [1] //
Melanie: Yeah, well, it's kind of, like, it's- [NV - Jacob sneezes] it's not like he has a heart or something, so- [1] why would he put a coat on? [1]
Ms. Logan: [1] That's what I said. He's not alive, ?????
Jacob: Well, they probably want to put a coat on him so then they can play around and try to make him last until he melts.
Melanie: But he looks perfect the way he is!
Jacob: But not forever. But- he's- he still melts.
Sandy: But that's the circle of life, technically.
Ms. Logan: Are they supposed- are they putting a coat on him to decorate him?
[Students shake their heads no, some verbally say no] What's the purpose of [1] them putting the coat [1] on?
George: To keep it cold for - [1] longer.
Sandy: [1] Longer.
Jacob: So yeah, on hot days.
Ms. Logan: Okay so that's the q- that goes- that's the question we're trying to answer here. What's the reason for putting the coat on it and do they think- do you think they should or should not?

During this discussion, there were a few changes occurred. Students started to invite other regular members to talk and even praised one another (You make a good point; Oh, by the way, compliment to you George. Good hand signals). Yet, there was also, Johnny, a new group member who did not participate during discussion. Other students did not notice him until the end; and his participation was limited to stating
initial position and restating his position in the end. Ms. Logan herself only prompted his participation near the end of the discussion. She asked if he had anything to say after another student had asked him. Despite this, Ms. Logan praised the group for encouraging him to participate.

During debriefing, Ms. Logan shortly asked students their final position without reflection on what students thought of their discussion. She also encouraged Johnny to participate more next time. She then proceeded on giving students a follow-up writing task.

Ms. Logan’s Collaborative Reasoning Discussion 7 – A Permit to Climb

Reading the story “Permit to Climb Mount Everest”, the group discussed whether the policy of limiting young climbers should change and Tyler should be allowed to climb Mount Everest. The discussion lasted for 18 minutes with around 2 minutes setting the discussion and 2 minutes summing-up and debriefing. Similar to the previous discussed sessions, Ms. Logan utilized reminds a number of time because students still struggled to focus on the main question.

During discussion, Ms. Logan wrestled to give opportunity for students with minority position at the same time refocus the discussion. Initially, Danny held the discussion floor arguing Tyler should not climb the mountain. He almost did not allow other members with different views to talk. When students with different view talked, he interrupted several times. The following excerpt shows an example of Ms. Logan’ several attempts to help Ella to talk and bring student back to the main question:

Ms. Logan : Ok Danny. Ella I know that you were trying to break in ??? What's your what are you thinking ??? [1][1] I know
Ella : [1] A few things. I've been saving up [1]
Ella: Um with a lot of things you've [NV: points to Danny] said actually. The tent thing I heard that- I saw like a [1][1] No Danny please no um no I heard that um it's really ??? to climbing there's like tents that will hang so you like sleep hanging off the side of a cliff. And um also uh it- it is possible it's it's


Danny: I'm not saying it's not possible. I'm just saying

Ms. Logan: Kay Danny you should let her finish

Ella: The chances are related to Neil Armstrong not very good. My dad knows somebody named um who has the last name "Armstrong" and he's like his best friend too. Chances are that's ??? Neil Armstrong

Jacob: Well true it could be true or the mother could've had another baby from after Neil Armstrong but after when Neil Armstrong died- died more likely and then she probably had him so then he could??? following his other dream like his brother did if it was true that he was his brother

Ms. Logan: Yeah I think we're straying off point here a bit [1][1] um the article is not about Neil Armstrong [2][2] Is Tyler- can Tyler- should Tyler be allowed to climb Mount Everest? [3][3] Adalae go ahead


George: [2] Yeah I know I was just gonna say that [2]

George: [3] Uh I don't think so cause [3]

Sydney: Um it doesn't say anything about Neil Armstrong so um [1][1] uh yeah I think he should mostly because um his parents are supporting it like his dad and his mom um and also if he wants to um if he wants to at least try he could but if he can't- if it ends up that he can't make it he could just come back down but actually if um but if they sometimes like a helicopter will come up to the top and get them down but sometimes they can't so they have to walk down

Although in the end Danny invited other members to participate and even tried to refocus discussion (Guys we have to stick with the text), Ella and Sydney’s different view were not explored as much. Much of the discussion talked about why Tyler should not climb, with a few students expressed why he should. In the end, everyone’s positions were still the same.

During debriefing, for the first time, students expressed dissatisfaction. Ella and Jacob mentioned that there were too many interruptions and overlapping exchanges. For
the next discussion’s goal, Ms. Logan added, students should practice using carefully-thought reasons and evidence besides working on staying on topic.

**Summary of Teachers’ Facilitation**

Overall the teachers’ instructional moves were mostly effective. Further, the amount of speaking turns gradually decreased through 4 facilitations examined in this study. Ms. Anthony, Ms. Janek, and Ms. Logan applied Collaborative Reasoning Discussion in different manners. While Ms. Logan was more hands-off and applied limited instructional moves, Ms. Anthony and Ms. Janek tended to be more active in navigating discussions and utilizing more instructional moves.

In Ms. Anthony’s group, as students increasingly became more independent, Ms. Anthony’s support lessened. Although student behavior was still an issue, one of her students gradually adopted a teacher role as she also practiced prompting for reasoning, encouraging equal participating, providing feedback, and reminding other students about discussion norms. Ms. Janek used a more active facilitation style that have both positive and negative effects. Sometimes, her active manner might have temporarily halted the discussion flow. At other times, her active response effectively assisted students when they were just learning to engage in Collaborative Reasoning discussions. Since the 2nd facilitation, she had been quick in directing students to use reasoning and evidence, to talk to each other, and to encourage equal participation. Throughout the 4 discussions, Ms. Logan was a hands-off facilitator. Her instructional moves were mostly limited to **prompting and reminding students of norms for discussion**. Gradually, she attempted to intervene early and helped balance the discussion. However, student behavioral issues remained challenging despite her attempts to refocus the group.
As illustrated in Figure 3, *prompting, stepping in and reminding of ground rules and norms of discussion, and asking for clarification* were the most frequently applied instructional moves. These instructional moves occurred mainly because students were just starting to engage in discussions with such formats. Besides requiring support of their social skills during discussions, they also needed help to improve reasoning skills. Initial support teachers implemented to improve social skills includes redirecting students to talk to each other, not only to the teacher; asking students to be better listeners to reduce interruptions; reminding students that disagreement is about ideas, not personal attacks; and encouraging equal participation. Teacher support to improve reasoning skills includes focusing on the main question; connecting reasoning to a position; using evidence from personal experience as well as citing evidence from the text; and considering the opposite viewpoint.

Teachers also implemented other instructional moves, such as *encouraging, fostering independence, thinking out-loud, and challenging* although they were limited. Since teachers were focusing on supporting the basics for reasoning and social skills during discussion, several of the latter instructional moves occurred minimally or later. These instructional moves were implemented only when certain situation occurred; were limited due to time constraints; were not as practical as other instructional moves to apply; and perhaps, were not directly helpful given the group dynamic teachers faced. For example, Ms. Anthony and Ms. Logan did not apply *challenging* because there were always two sides within the group. Ms. Janek challenged students to consider an opposite view only when all students agreed on one position. *Encouraging* students for their positive behavior or reasoning skills occurred later as students had practiced more.
Teachers also mainly applied *encouraging* during *debriefing* to highlight what students did well during discussions. However, not all teachers allowed time for post-discussion reflection.
CHAPTER 6

DISCUSSION AND CONCLUSIONS

This study examined the role of group reflection in teachers’ learning to implement Collaborative Reasoning (CR) discussions. In analyzing teachers’ group reflections, three themes emerged that include challenges that teachers constantly experienced, progress they made over time, and support that teachers received from by both the researchers and teachers. These themes are related to the procedural and technical aspects of implementing Collaborative Reasoning discussions, philosophical and conceptual understanding of Collaborative Reasoning, and logistics. Despite teachers’ constant struggles to implement the method, they appeared to be more confident towards the end. As their confidence increased, the number of challenges also gradually decreased.

Summary of Findings

Teachers’ learning journey was further classified into three phases, with phase 1 on getting familiar with the discussion format, phase 2 on beginning to notice students’ progress, and phase 3 characterized by their increased confidence. There is progression in teachers’ understanding of CR, which reflected on the challenges that they recognized in facilitating discussions. In phase 1, teachers were primarily concerned with helping students connect with each other’s ideas to achieve the surface level of collaborative reasoning, while in phase 3, they were able to prompt students to consider other perspectives to enrich the discussions. Despite going through similar phases of reflections, the three teachers reached very different destination at the end of the study:
Ms. Anthony aspired to figure out how she could challenge her students to think about other points of view so the discussions can be more in-depth. Ms. Janek acknowledged that she learned to release some control when orchestrating classroom discussions. Ms. Logan felt she had not helped her students enough because she was just starting to feel comfortable in her role.

In analyzing how teachers facilitated Collaborative Reasoning discussions, Chapter 5 summarized findings on different types of instructional moves teachers employed and the effectiveness of these instructional moves. Among all the instructional moves, prompting, reminding of norms for discussion, and asking for clarification were the most frequently utilized. While teacher speaking turns generally declined over the course of four observed facilitations, each teacher learned to facilitate small-group discussions in a different pace and manner. Ms. Anthony and Ms. Janek were both actively engaged facilitators while Ms. Logan was more hands-off.

**Discussion of Findings**

This study showed that asking teachers to shift to a dialogic pedagogy, such as implementing Collaborative Reasoning discussions, is complex and creates conflicts during the process (Sedova, 2017). However, a productive conflict in a teacher’s learning can result in an improved teaching practice (Ward, Nolena, & Horn, 2011). Second, although utilizing this format is new for most teachers, teachers bring in their own teaching styles and philosophies that they were already comfortable with to integrate the new approach into their teaching, which is particularly true with veteran teachers. Existent teaching style, however, may help or inhibit teachers’ adoption of a more dialogic pedagogy practice. Finally, teacher reflection plays a pivotal role as a connector
between theory and practice (Korthagen et al., 2001; Sun et al., 2020). This study reveals that teachers’ group reflections allowed them to try a new pedagogy, intentionally reflect on their experiences, and search for strategies to resolve the conflicts. Although being an iterative process, the reflections provided further support for teachers’ advancement in using the pedagogy.

Teachers may find it difficult to balance its multiple aspects and principles when implementing discussion-based teaching (Lefstein & Snell, 2014; Sedova et al., 2014). Collaborative Reasoning offered teachers a set of tools to teach students how to use logical, critical thinking in a social context. Teachers learned to effectively facilitate discussions by employing instructional moves that they may not have readily used, such as prompting for arguments, reminding norms for discussion, asking for clarification, fostering independence, and challenging students to think about different perspectives. However, implementing these instructional moves created tension, as noted in the work of Alexander (2006) on dialogic-teaching principles. When teachers aimed to encourage participation, they have to refrain from providing critical feedback; as a result, student exchanges moved away from the main question. For example, in discussion 4, Ms. Janek tried to invite a quiet student, Sally, to talk. Sally’s reasoning was superficial and should have been challenged with critical feedback, but Ms. Janek did not challenge her because she was concerned that it might discourage her from speaking further.

Another example of a conflict when implementing instructional moves was teachers’ struggle to foster independence while at the same time teaching students to reason with their peers instead of the teachers. In Collaborative Reasoning, one of the teachers’ tasks was helping students to express their points of view supported with
evidence. Students also needed to collaboratively construct reasoning with peers, which was a new experience and difficult to navigate. Instructional moves, such as *prompting* and *clarifying* were thus useful to support students’ development of reasoning. However, if these instructional moves were used too extensively, students might be dependent of teachers’ support. Such conundrum presented challenges that teachers had to wrestle with throughout the study. For example, early in the discussions, all teachers struggled in prompting students to connect evidence to their reasoning while also asking students to direct their response to each other rather than the teacher. When teachers intervened with prompting and clarifying, students naturally tended to direct their attention to the teacher and waited for her affirmation instead of talking to the group.

The concept of tension as a productive part of learning has been discussed in a study examining conflicts as teachers’ opportunity to learn (Ward, Nolena, & Horn, 2011). Ward et al. (2011) state that only when teachers experiencing a state of confusion and work towards a solution, a deep level of learning can happen. Data from teachers’ group reflections support this claim. In the 8th teachers’ group reflection, Ms. Janek reflected on her facilitation. At first, she struggled to find her balance. She felt uncertain whether she talked too much and did not know when to interject or when to be quiet, and tried to take cues from students. In the end, not only did she feel more natural and enjoyed her facilitations, she emphasized that engaging in such activities had given her students opportunities she did not have grown up: “learning to express one’s voice in a respectful manner, to still be friends even after a disagreement, and to acknowledge and encourage each other when communicating.”
Teachers’ existent teaching styles influenced how they facilitated small-group discussions. Sedova (2017) states that when teachers learn to teach using small-group discussions, they are willing to negotiate to fill in the gap between their own current practice to align with the principles of discussion-based teaching. This negotiation process may result in different outcomes in each individual teacher. As Grossman et al. (1999) states, the outcomes of professional development range from inability to utilize the new method, to superficial adoption, to a full comprehension of the concept as well as an ability to appropriately apply the new method. In this study, comparing data between teacher reflections and facilitations, each teacher adopted Collaborative Reasoning method differently based on their teaching approach.

For Ms. Anthony and Ms. Janek, facilitating small-group discussions were challenging; however, both teachers started to notice both students’ and their own progress halfway through the six-month study. Ms. Anthony, a new graduate with a Master’s degree in Teaching and Learning and with a teaching licensure, recently learned about dialogic pedagogies from her coursework. It was plausible that facilitating small-group discussion using the Collaborative Reasoning format was somewhat more accessible for her because of her recent academic training Ms. Janek’s training as an adult literacy coach might have given her more experiences with specific instructional moves that were common in Collaborative Reasoning. Shifting to this student-centered discussion format was challenging in the beginning, but her reflection during the last teacher reflection showed substantial learning and confidence she gained as well as promising changes that she observed from her students. Both Ms. Anthony and Ms. Janek were likely to continue using Collaborative Reasoning in their future teaching given their
positive experiences shared at the end. For Ms. Logan, implementing Collaborative Reasoning had been a completely innovative method for her. As explained by Ms. Janek in Teacher Group Reflection 5, Ms. Logan’s early training as a teacher was all about free inquiry and less guided teaching style. Although on the surface level, Ms. Logan had no trouble releasing control to allow more students’ dialogue, she may have given too much freedom to the students that their discussions were constantly struggling to stay on topic. Ms. Logan remained uncertain towards the end of the study, and it was unclear whether she had any interest in continuing the discussion format with her students.

Besides the interesting findings of teachers’ learning journeys, this study also shed light on the critical role that teacher group reflections played in supporting teacher learning. As Korthagen et al. (2001) states, teacher reflections are the “lynchpin” during the process of change: teachers teach, reflect on their teaching practice, and plan for alternative approach. When teachers gathered in groups to reflect on their experiences implemented Collaborative Reasoning, they became aware of essential aspects of the new pedagogy, such as a better understanding of the procedural and technical aspect of implementation, a more thorough view of the philosophical and conceptual underpinning of Collaborative Reasoning, and the logistics of integrating it into their regular teaching in the myriad of constraints that compete for teachers’ limited time and attention. During group reflections, teachers also brainstormed and asked for strategies to improve how they could facilitate discussions, and then went into the next discussions to employ such strategies. For example, teachers expressed their concerns of students’ lack of fundamental knowledge of argumentation during the 1st reflection, as they observed in the very 1st Collaborative Reasoning discussion. The lead researcher offered to provide a
tool called the argumentation house for teachers to use before the second Collaborative Reasoning discussions. It took teachers several rounds of discussions and group reflections, however, to figure out exactly how to use the tool so that it was most helpful. This example illustrated the iterative process of teacher learning where group reflections served as the central place where they interrogate suggestions offered and strategies they attempted. The paragraphs below detailed the process.

Reflection on the 1st discussion facilitation, teachers concerned about students lack of understanding of basics of argument components and how to express an argument. For example, Ms. Anthony observed that students appeared not to connect evidence to reasoning. She was unable to track students’ position due to students’ confusion of their own position. She also concerned some students thought the word “argument” means “to argue.” During reflection, teachers and researchers discussed about giving a mini lesson that explain what an argument consists of. The researcher then suggested to present an argument house template to show students components of an argument, such as position, reason, evidence, challenge, and response to challenge.

In the subsequent facilitation, Collaborative Reasoning 2, while Ms. Anthony did not use the template at all because she was not sure how to use it, Ms. Logan presented it, but she did not elaborate it. In the next reflection, the researcher offered a short reading with an example of how to fill out at argument house; and for the second time, teachers discussed about utilizing argument house. Not until the last reflection Ms. Anthony mentioned that incorporating argument house helped students internalize their learning. She explained that during Collaborative Reasoning discussion 4, she incorporated argument house as a separate reflection activity, where students reflected on their
argument and write their position, reason, evidence, challenge, and respond to challenge. Students enjoyed the discussion the most because they had the opportunity to reflect beyond the discussion and wrestle with their ideas more. A positive improvement also occurred in Ms. Janek’s Collaborative Reasoning discussion 4. She reflected that she was pleased students were able to express reasoning incorporating evidence from the text. Students even deliberately practiced using expressions, such as “challenge”, “disagree”, and “agree” to mark their point of view.

Another sample of a reflection as a tool to improve facilitations was an activity where teachers read a facilitation transcript in Teacher Group Reflection 5. Ms. Janek mentioned that reading the transcript gave her examples of an ideal facilitation, especially the importance of setting the discussion, reminding students of norms for discussion. A noticeable change on Ms. Janek’s opening the discussion occurred in her 7th facilitations. She spent the most time to engage students with essential discussion aspects. She asked each student their individual goal for the discussion. She reminded students what strategies they could use to encourage equal participation, and to use the text to support reasoning and evidence. Compared to the previous discussions, such as in the 4th facilitation, she went straight to ask students their initial position; and 5th facilitation, she only addressed Sally, the quiet student, to remind her goal to speak more.

**Relationship between Teacher Reflection and Their Facilitations**

In teachers’ learning to implement Collaborative Reasoning, teacher reflection functions as a type of scaffolding that allows teachers to share and learn from each other and with the support from the research team. Scaffolding as a temporary support allows learners to learn with the assistance from their peers and knowledgeable others until they
are able to carry out the task successfully and independently (Pea, 2004; Vygotsky, 1986). Teacher group reflection, a type of scaffolding, provide opportunities for teachers and researchers to collaboratively identify challenges, successes, and supports needed when implementing CR. In facilitations, teachers try out the method incorporating instructional moves. As a continuous cycle, each facilitation was followed by a teacher group reflection. Without the reflection part, it is plausible that teachers may still be able to implement Collaborative Reasoning. However, given that teachers’ struggle dominated the reflections, it is also possible that teachers will find it difficult to assess their own effectiveness and receive assurance to build self-confidence and obtain help from their peers and the research team when they face challenges.

Implications for Practice

This study revealed findings that can be useful to design an effective professional development aimed at improving dialogic practice in classroom setting. The findings inform teachers and researchers who are interested in dialogic teaching specifically Collaborative Reasoning method related to teachers’ experience when implementing and reflecting on adopting the method. The outcome of this study shows that teachers’ group reflection served as “lynchpin” (Korthagen et al., 2001) between theory and practice. As such, teacher reflection should be an integral part of teaching in order to support and strengthen their professional and educational journey.

Findings suggest that semi-structured periodic reflections allow teachers and professional development facilitators to identify challenges and develop strategies based on school context, class’ characteristics, and each teacher’s background and teaching style. Periodic group reflections may provide promising benefit when utilizing tools and
activities based on literature as well as adapting and answering to teacher’s questions and struggles. Provided with consistent opportunities for reflective activities and such trainings may further promote teacher’s success in implementing dialogic teaching approach in their professional and educational journey (Sedova, 2017; Sun, 2020).

**Limitations and Future Research**

Despite careful scrutinization of teachers’ group reflections, this study is limited in the available data for analysis regarding teacher learning of a new pedagogical approach. Besides discussing in the small group, teachers had probably reflected on their experiences facilitating Collaborative Reasoning on their own or at times that were not captured by researchers during the six-month study. Data presented in this study did not capture teachers’ individual reflection during the process and thus it was unclear how it may have influenced their learning in general. Future research which seeks to examine the role of teacher reflection should capture both individual and group reflections to triangulate data and provide a more comprehensive picture.

Besides the limits in using existent data, this study also only examined subsamples of teacher facilitations that represented the beginning (Collaborative Reasoning 2), middle (Collaborative Reasoning 4 and 5), and end (Collaborative Reasoning 7) of one group’s discussion per each of three teachers during the six-month study. The next step is to conduct additional analyses that include all Collaborative Reasoning discussions with different groups as well as compare teachers’ base line teaching with their teaching after the study. The additional analyses have potentials to reveal whether teachers actually changed their teaching outside of the designated
Collaborative Reasoning discussion time to be more dialogic. It is interesting to also examine whether teachers’ use of instructional moves have shifted after they participated in this study.

**Conclusion**

Teachers are the agents of change when transitioning to a more dialogic pedagogy, such as incorporating small-group discussions in their classrooms. Findings from this study indicate that shifting to a more dialogic teaching practice is a complex process. Nevertheless, engaging teachers in group reflections provide opportunities for teachers to be aware of their struggles and a working space to find solutions that they later use to resolve their issues. It also helps improve teachers’ conceptual understanding and actual implementation of dialogic teaching, and supports their gradual development of confidence. This study contributes to our understanding of teacher learning, the role of group reflections, and sheds light on how to support future teachers in adopting a dialog-based pedagogy to help their students develop the essential 21st century skills such as argumentation and collaboration.
REFERENCES


Ma, S., Anderson, R. C., Lin, T., Zhang, J., Morris, J. A., Nguyen-jahiel, K., Miller, B. W.,


# APPENDIX A. CODING THEMES IN TEACHER REFLECTIONS

<table>
<thead>
<tr>
<th>Main themes</th>
<th>Core Themes</th>
<th>Sub-Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaffolding from researchers</td>
<td>Scaffolding in understanding Collaborative Reasoning (CR)</td>
<td>Praising</td>
</tr>
<tr>
<td></td>
<td>Scaffolding in conducting CR</td>
<td>Advising</td>
</tr>
<tr>
<td>Success or positive impressions</td>
<td>Success in understanding CR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotional reactions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Success in conducting CR</td>
<td>Effective teacher behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Satisfying student performance</td>
</tr>
<tr>
<td>Uncertainties and negative</td>
<td>Negative emotions</td>
<td></td>
</tr>
<tr>
<td>impressions</td>
<td>Uncertainties in understanding CR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External constraints in conducting CR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertainties in conducting CR</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX B. CODING THEMES IN TEACHER FACILITATIONS

<table>
<thead>
<tr>
<th>Main themes</th>
<th>Types of Instructional Moves</th>
<th>Descriptions for Each Instructional Moves*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ Talk</td>
<td>Set the discussion</td>
<td>Posing the Big Questions and ask students to state their initial position.</td>
</tr>
<tr>
<td></td>
<td>Prompts</td>
<td>Asking or telling student to state their positions, reasons, evidence, alternative viewpoints, and/or evaluation.</td>
</tr>
<tr>
<td></td>
<td>Encourages</td>
<td>Acknowledging and praising students for progress in reasoning and participation skills.</td>
</tr>
<tr>
<td></td>
<td>Clarifies</td>
<td>Asking students to be clear in their argumentation.</td>
</tr>
<tr>
<td></td>
<td>Challenges</td>
<td>You can challenge your students to consider alternative points of view. You can also challenge the connections that they are making in their arguments.</td>
</tr>
<tr>
<td></td>
<td>Reminds</td>
<td>Step in and remind students of the ground rules and norms for the discussion.</td>
</tr>
<tr>
<td></td>
<td>Thinks Out-loud</td>
<td>Describing what is going on inside your mind as you work through the thinking process.</td>
</tr>
<tr>
<td>Foster Independence</td>
<td>Sum-up</td>
<td>Periodically throughout the discussion you should sum up what students have said and help the group re-focus on the Big Question. As part of this process, you can also have students evaluate arguments that have been posed.</td>
</tr>
<tr>
<td></td>
<td>Debriefs</td>
<td>A metadiscussion on the quality of the reasoning and participation dynamics in the group.</td>
</tr>
</tbody>
</table>

### Effectiveness of Teachers’ Moves

<p>| Effective prompts | Ineffective prompts          |  |
|-------------------|------------------------------|  |
| Effective encourages | Ineffective encourages |  |
| Effective clarifies | Ineffective clarifies |  |
| Effective challenges | Ineffective challenges |  |
| Effective reminds | Ineffective reminds | Within each discussion, students’ talk immediately after a teacher’s speaking turn |</p>
<table>
<thead>
<tr>
<th>Effective thinking out-loud</th>
<th>Ineffective thinking out-loud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective foster independence</td>
<td>Ineffective foster independence</td>
</tr>
</tbody>
</table>

was analyzed to see if effectiveness was readily apparent or not

* Based on the CR Teacher Binder by The Collaborative Reasoning Research Group, Reading Research Center, Center for the Study of Reading University of Illinois at Urbana-Champaign