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Investigating scaffolding strategies for promoting reasoning-based, collaborative discourse with linguistically diverse learners in the mainstream classroom

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BOSTON UNIVERSITY
WHEELOCK COLLEGE OF EDUCATION & HUMAN DEVELOPMENT

Dissertation

**INVESTIGATING SCAFFOLDING STRATEGIES FOR
PROMOTING REASONING-BASED, COLLABORATIVE DISCOURSE
WITH LINGUISTICALLY DIVERSE LEARNERS IN THE
MAINSTREAM CLASSROOM**

by

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Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Education

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Through critical, self-reflexive practices embedded in our research and teaching, we can work against racial, cultural, linguistic, and socioeconomic inequalities by creating humane classrooms where students and teachers learn to use language and literacy in critical and empowering ways.

(National Council of Teachers of English, 2005, para. 1)

I cannot teach anybody anything. I can only make them think.

–Socrates

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ABSTRACT

The Common Core State Standards (CCSS, 2012) call for shifts in teaching and learning, emphasizing diverse students' complex uses of language and skilled articulation of reasoning in collaborative discussion settings. Concurrently, it is becoming increasingly common for English Learners (ELs) to be educated in mainstream classrooms alongside their English-proficient peers, raising the challenge for teachers to effectively mediate these new standards into practice for all students. This design-based research study, grounded in sociocultural theory, was carried out in collaboration with two classroom teachers. The study focused on the implementation of discussion scaffolding strategies, including academic language functions (e.g., language used by students to tell, restate, build on, or challenge). Analysis investigated shifts in both whole class discourse and the discourse of four English learners in the classroom over a seven-month period.

Qualitative and quantitative analyses of eight audio-recorded discussion transcripts examined shifts in student talk, with particular attention to (a) participation, (b) reasoning, (c) collaborative talk, and (d) use of academic language for engaging in

dialogue with peers.

Analyses revealed that as teachers successively introduced the four categories of talk moves, students engaged in significantly more reasoned, collaborative talk. Over time, students also used the academic language stems with greater frequency and exhibited increased autonomy in reasoned-focused, collaborative talk. Additionally, collective reasoning (prompted by instructional moves designed to have students think with others) appeared to promote individual reasoning, as shown by higher instances of reasoning words used by students. Shifts in talk for EL students were similar to those of the whole class, with key differences being how ELs were afforded additional opportunities for second language development in the context of discussion: ELs had a chance to listen to and express complex reasoning, extended discourse, and relevant language functions in contextualized ways. They engaged in meaningful and sustained interactions with English-proficient peers. Finally, ELs connected new learning with their prior knowledge and experience. These findings pose important considerations for implementing standards in ways that support reasoning-based, collaborative discourse for all students—while simultaneously affording ELs learning opportunities for developing language proficiency and disciplinary knowledge in an equitable learning environment.

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CHAPTER 1: INTRODUCTION

The Common Core State Standards in English Language Arts (CCSS; Council of Chief State School Officers [CCSSO], 2012; National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010a, 2010b) set as a goal that all students participate effectively in rigorous, structured conversations about grade-level topics and texts. These standards emphasize interactional competence, the skilled articulation of reasoning, and complex uses of language. The context for applying these skills is classroom talk in which students gain, evaluate, and present complex information, ideas, and evidence in dialogue with their peers and teachers (Heritage, Walqui, & Linqunti, 2015). The standards, therefore, call for transforming typical classroom pedagogy to provide students the opportunity to engage in reasoning-focused, collaborative discourse in mainstream classroom settings (Bunch, Kibler, & Pimentel, 2012).

One complexity of applying these standards is the increase in the presence of English learners (ELs)¹ in mainstream classrooms. ELs are the fastest-growing and

¹In keeping with the administrative term used by the Massachusetts Department of Elementary and Secondary Education (2011) to identify students who are developing their proficiency in English, I chose to use the term EL throughout this paper to refer to students who are developing proficiency in English. The term *emergent bilingual* (EB) has been proposed as encouraging an asset-based perspective of this subgroup of learners because it builds on the home language of students and recognizes this as a fundamental strength rather a *language deficiency* (Garcia, Kleifgen, & Falchi, 2008). Though other terms have been proposed, I use this term EL because it was regularly used in the school setting where this study took place, and its prominence and familiarity in the literature makes it an accessible way to talk about these students. I use this term in tandem with the belief that English learners bring immeasurable value to the classroom due to the

largest student subgroup in public schools across the United States. During the 2015–2016 school year, nearly one in 10 of the total 4.7 million students in public schools were ELs (U.S. Department of Education [USDOE], National Center for Education Statistics, 2018). Projections indicate that by 2025, ELs will comprise nearly 25% of public school students in the United States (Truong, 2017). Current policy in several states, including Massachusetts, California, and Arizona, places the great majority of English learners in mainstream content classrooms for at least part of the school day, where they are expected to learn the same academic material as other students while simultaneously developing proficiency in English (Gándara, Maxwell-Jolly, & Driscoll, 2005).

Although ample research has acknowledged the rich social and educational benefits of learning in culturally and linguistically diverse classrooms (Banks, 2010; Fowers & Davidov, 2006; Gay, 2000), access to these benefits is shaped by a variety of factors—including equitable academic practices and opportunities for EL students to learn alongside their peers. There is a growing demand to identify effective instructional strategies that address the varied linguistic and academic needs of language-minority students in mainstream classrooms, while also ensuring that all students are held to the same high expectations laid out in the Common Core State Standards for English Language Arts.

linguistic and academic competencies they have gained from bilingual/multilingual experiences and literacies, and this underlying belief serves as the bedrock of this study. Additionally, I refrain from using the label *native speaker* because the label assumes that there is a native-speaking ideal and overlooks the dialects and linguistic varieties of English used around the world (Holliday, 2008). I use the term *non-English learner* (non-EL) to refer to students who are not identified as ELs. Some of these students may be former ELs.

Study Purpose and Overview

Despite scholars, researchers, and the CCSSs calling for increased, ambitious classroom discussion as a context to support learners in developing school-based thinking and speaking practices, few empirical studies have investigated the instructional scaffolding strategies that foster constructive classroom discourse among students who are English Learners (ELs) and non-ELs in culturally and linguistically diverse mainstream classroom settings. In this study, I sought to address this gap in the literature by (a) identifying the challenges associated with engaging diverse learners in whole class collaborative discussions in a mainstream classroom at the fifth-grade level; (b) implementing scaffolding strategies that foster constructive discourse; and (c) identifying and accounting for shifts in whole class and individual discourse, with an additional focus on the talk of English learners.

I used the Design-Based Research (DBR) paradigm because it is a collaborative approach that engages both researchers and practitioners in systematically analyzing, designing, and evaluating educational interventions aimed at addressing complex, real-world educational problems. DBR addresses questions of genuine interest to both educators and researchers, with the practical goal of developing “usable knowledge” (Lagemann, 2002). Moreover, DBR draws from both quantitative and qualitative methods to understand how and why theory-driven educational interventions work *in practice* (Anderson & Shattuck, 2012; Design-Based Research Collective, 2003). Ultimately, the purpose of this approach is to generate refined principles for conceptualizing learning and instruction that help communicate relevant implications to

practitioners and other educational designers (Design-Based Research Collective, 2003; Plomp, 2013).

This DBR study was conducted in a fifth-grade mainstream classroom at a public elementary school in a semi-urban district in Massachusetts in collaboration with two teachers: Mr. M, the ESL specialist with more than 20 years of teaching experience at the school, and Ms. P, the fifth-grade general education teacher with more than 25 years of teaching experience at the school. The classroom student population included four students who were classified as English learners. The study was carried out during regular class time over a period of seven months. Data sources included audio recordings of whole class discussions, field notes from class observations, and notes from monthly meetings (Design Team meetings) with the teachers.

The study comprised four phases, grounded in Amiel and Reeves's DBR framework (2008): (a) Phase 1, Needs Assessment: analysis of practical problems by researchers and practitioners; (b) Phase 2, Development of Solutions: development of solutions grounded in a theoretical framework and informed by existing research; (c) Phase 3, Implementation and Reflection: implementation of solutions in practice; and (d) Phase 4, Data Analysis and Generating Design Principles: empirical analysis using quantitative and qualitative approaches and generating design principles.

In the first phase (Needs Assessment), I collaborated with the ESL teacher and the general education teacher to address the following research question:

Q1. What are the challenges associated with engaging culturally and linguistically diverse learners in whole class, collaborative academic discussions

(as described in the Common Core anchor standards CCSS.ELA-Literacy.SL.5.1)

in this mainstream classroom at the fifth-grade level?

Based on initial analysis in answer to this question, in the second phase of the study (Development of Solutions) we codesigned an intervention informed by principles drawn from the literature on “Academically Productive Talk” (Chapin, O’Connor, & Anderson, 2009); “Academically Productive Talk Moves” (Michaels & O’Connor, 2011); the “Language as Action” perspective (van Lier & Walqui, 2012); and Scarcella’s (2003) sociolinguistic, discourse component of academic English. The design included scaffolding strategies to support students’ effective participation in collaborative, whole class discussions. The following set of questions guided the Implementation and Reflection Phase (Phase Three) and the Retrospective Analysis (Phase Four) of the study.

Q2. In conditions where teachers systematically implement (a) “Academically Productive Talk Moves” and (b) the explicit instruction of academic language functions (e.g., language used by students to tell, restate, build on, or challenge) to scaffold student communication and reasoning in discussion, how do the discourse patterns of the whole class change? How, if at all, does the talk of students shift over time, with particular attention to (a) participation, (b) reasoning, (c) engagement in collaborative talk, and (d) use of language functions?

Q3. How, if at all, does the individual talk of students who are English Learners shift over the course of the intervention, with particular attention to (a)

participation, (b) reasoning, (c) engagement in collaborative talk, and (d) use of language functions?

Articulation of the Need for Research

The United States has long been characterized by cultural and linguistic diversity, and ensuring that English Learners are able to participate meaningfully and equitably in public school settings has been an ongoing effort (U.S. Department of Justice, Civil Rights Division, and U.S. Department of Education, Office for Civil Rights, 2015). Moreover, the state-led Common Core State Standards Initiative (CCSSI), launched in 2009 and adopted by 42 U.S. states, articulates rigorous grade-level standards and stresses that *all* students—regardless of their language proficiency levels—should be held to the same high expectations it outlines. Thus, it is of utmost importance to identify the challenges and opportunities presented to ELs with each of the CCSS’s domains—and to highlight the understandings about second language learning that are crucial to successfully enacting the vision laid out by the Common Core State Standards.

In the ensuing sections, to further ground the significance of the problem and the approaches I take, I engage in a brief discussion of reasons for the increasing presence of students who are English Learners in mainstream classrooms. Next, I consider why discussion-based pedagogy is deemed to be important with all students but especially with culturally and linguistically diverse students. Then, I explore some of the challenges associated with implementing effective critical conversational practices in ways that support all students in mainstream classroom settings. This description sets the stage for understanding the approaches I took toward codesigning and engaging in design-based

research alongside teachers, which are the focus of Chapter 2.

English Learners in Mainstream Classrooms

Although research suggests that bilingual programs combining academic content in the native language and second language (L2) may be most effective at facilitating the closure of the achievement gap (Thomas & Collier, 2002), increasingly, states are opting for English-only instructional models that call for the inclusion of ELs in mainstream classrooms (EPE Research Center, 2009). In large part, this is because English-only instructional models can easily accommodate districts where the language-minority population is very diverse: Students from different language backgrounds can learn in the same class, and teachers do not need to be proficient in the home languages of their students. Additionally, there is a growing concern that ELs’ “academic and linguistic isolation from the mainstream classroom” (Kanno & Kangas, 2014, p. 851) can result in limited access to grade-level content, as well as low tracking (Bunch, 2006, 2009; Gándara & Orfield, 2012).

Simply integrating ELs into the mainstream classroom, however, in no way ensures students’ access to linguistic and academic development opportunities. For one thing, ELs’ linguistic and academic isolation can be compounded by inequitable instructional practices (Gándara & Orfield, 2012). Additionally, students who are not proficient in English are intellectually capable but need additional supports to meet rigorous academic language and content standards (Gándara et al., 2005)—such as multilevel strategies, linguistic scaffolding, and cooperative learning opportunities to name a few (Carrier, 2005; Goldenberg, 2008; Lawrence-Brown, 2004; Mohan,

Lundeberg, & Reffitt, 2008; Zwiers, O’Hara, & Pritchard, 2014). This calls for a transformed pedagogy in which ELs are afforded equitable opportunities to learn grade-level content while also developing proficiency in English alongside their peers. Moreover, preparing ELs to meet these new standards necessitates collaboration among teachers across disciplines and must become the shared responsibility of second language teachers and mainstream teachers.

Realizing Opportunities Presented by the Speaking and Listening Standards

Oral language proficiency through collaborative talk has been one increasingly important avenue for fostering content learning and language development. August and Shanahan (2006) argued that oral language proficiency underscores advanced academic literacy and supports ELs’ overall academic success. In fact, “oracy,” defined as “the ability to express oneself coherently and to communicate freely with others by word of mouth” (Wilkinson, 1965, pp. 4–5), has a profound effect on the success of *all* K–12 learners. Both native and non-native speakers learn content principally through language, and they need to be able to use oral language proficiently to express their understanding and reasoning across content areas in K–12 settings (Echevarria, Vogt, & Short, 2017). A mounting body of research suggests that numerous benefits are associated with oral language proficiency, including academic literacy, academic participation, positive self-concept, second/foreign language acquisition, academic language development, perspective-taking, knowledge-building, and the use of reasoning skills across content areas (August & Shanahan, 2006; Bailey & Heritage, 2008; Barnes, 1990; Chapin & O’Connor, 2012; Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Geva, 2006;

Goldenberg, 2008; Horowitz, 2007; Lemke, 1985; Mayer, 2012; Moschkovich, 2002; O'Connor & Michaels, 1996; Pica, 1994; Scardamalia, 2002; Snow & Uccelli, 2009; Sohmer, Michaels, O'Connor, & Resnick, 2009; Swain, 1995, 2000; Weissberg, 2006; Wells & Arauz, 2006; Zwiers, 2008). Zwiers (2008) purported that focusing on oral proficiency is essential for equipping ELs with the tools they need to access higher education and career opportunities—and for promoting educational and social equity. In sum, focusing on oral language development has the potential to yield rich benefits for all learners, ELs and non-ELs alike.

Multiple scholars have argued that oral language proficiency and content learning can be fostered through productive academic discussion (Goldenberg, 2008; Lemke, 1985; Michaels & O'Connor, 2015; O'Connor & Michaels, 1993, 1996; O'Connor, Michaels & Chapin, 2015; Sohmer et al., 2009; van Lier & Walqui, 2012; Wells, 1990). Chapin et al. (2009) argued that “Academically Productive Talk” (APT) has the potential to support both ELs and native English speakers in accessing and building knowledge about grade-level content and in acquiring academic ways of reasoning, speaking, and writing (Michaels & O'Connor, 2015). APT is a kind of talk that goes beyond students uttering “right” answers or making facile displays of content knowledge. Instead, talk is “productive” when it cultivates “intellectual socialization” as learners practice taking on “the particular roles and discourse forms that are valued in problem posing and problem solving in school” (O'Connor & Michaels, 1996, pp. 63, 66). Such practices include “externalizing one’s own reasoning, inquiring into the reasoning of others, and comparing positions and perspectives on an issue or problem” (O'Connor & Michaels,

1996, p. 65). Michaels and O'Connor's work (2011, 2012, 2015) has centered on what they call "Academically Productive Talk" *moves*, instructional *talk tools* intended to help students elaborate on inexplicit, underdeveloped ideas; listen carefully to others; deepen their reasoning; and think with others. Michaels and O'Connor (2015) explained that helping students accomplish these foundational goals is fundamental to engaging students in the thinking and speaking practices of their academic settings.

The Common Core State Standards (CCSSO, 2012) in Listening and Speaking (as described in the Common Core anchor standards CCSS.ELA-Literacy.SL.5.1) elucidate skills that are well suited to development through academically productive discussion as the kind elaborated above. The standards emphasize the development of students' complex uses of language and call upon students to articulate their ideas, present claims, build upon and challenge others' ideas, and confirm their understandings through reasoning-based, collaborative discourse. Additionally, the standards expect students to demonstrate interactional competence and to follow language norms conducive to participating effectively in the social context of the classroom (Hymes, 1972; Mehan, 1979).

Although discussion-based approaches for developing the skills envisioned in the standards hold promise for the language development of all learners, they are of particular importance for students who are also developing their proficiency in the English language. Promoting an action-based perspective for language development, researchers van Lier and Walqui (2012) suggested that English learners acquire language more effectively by actively participating in interactive-sense making through discussion

with peers. They suggested that the rigor of the Common Core Standards—which expect students to stimulate thoughtful, well-reasoned exchanges of ideas—provides an opportunity for language growth that cannot only be met through a purely grammatical or functional approach to language development (van Lier & Walqui, 2012). Instead, it requires providing ELs with opportunities to use language in meaningful ways, which in turn supports them in developing complex language and thinking skills (Echevarria et al., 2017). By emphasizing language as it relates to communicative and meaningful academic work—in tandem with the provision of appropriate supports and explicit focus on language—educators can help ELs realize the opportunities for second language development in the standards.

The Challenges of Supporting All Students in Collaborative Discussion in the Mainstream Classroom

Although scholars and educational researchers have affirmed the value of classroom talk and the benefits of instructional talk strategies for promoting language development and academic achievement among ELs and English-proficient students, research shows that, often, classroom practices do little to foster the kind of talk that attributes importance to reasoning and interaction among teachers and students in whole class discussions (Cazden, 1988, 1990; Gibbons, 2006; Johnson, 2004; Michaels & O’Connor, 2011, 2015; Nystrand, 1997; O’Connor & Michaels, 1993, 1996; O’Connor et al., 2015; Walqui, 2006; Zhang & Stahl, 2011; Zwiers & Crawford, 2011).

First, the types of discourse patterns most commonly employed in classrooms do little to promote participation, reasoning, or interaction. Lessons dominated by teacher

talk tend to be the norm (e.g., Alexander, 2008; Lemke, 1990; Lingard, Mills, & Hayes, 2003; Michaels & O'Connor, 2015; Nystrand, 1997; Walsh, 2002; Wells, 1990; Wells & Arauz, 2006). Edwards and Mercer (1987) found that teacher talk constitutes 76% of classroom talk, and most teacher talk entails display questions, explanations, commands/instructions, modeling, and feedback (Cummins, 1994; Forestal, 1990; Mohr, 1998; Ramirez, Yuen, Ramey, & Merino, 1986). Research also shows that teachers most commonly use the traditional Initiate–Response–Evaluate (IRE) discourse pattern identified by linguists Sinclair and Coulthard (1975), in which the teacher asks leading questions and learners attempt to get the “right” answer (Cazden, 1988; Forestal, 1990; Nystrand, 1997; Wells, 1999). Although these IRE steps can be useful in learning contexts in which either knowledge dissemination or “checking and quizzing” and clarification by the “expert” are necessary to advance learning, IRE discourse patterns fail to offer learners the opportunity to take risks with language (Zahner, 2012), engage in extended discourse (Cazden, 1988, 1990), externalize their reasoning (O'Connor & Michaels, 1996), and build knowledge through the exchange of diverse perspectives (Lemke, 1990; Sohmer et al., 2009). Thus, the dominance of IRE discourse patterns in the classroom limits opportunities for productive discussion.

To complicate matters further, ELs—who bring with them an array of experiences, cultural practices, and perspectives that can enrich classroom communities in invaluable ways—often remain silent and disengaged in class discussions with their English-proficient peers (Foster & Ohta, 2005; Penfield, 1987; Ramirez, 1992; Wilhelm, Contreras, & Mohr, 2004). Most newcomer ELs go through a “pre-production silent

period,” an interval of time in which ELs take in the language but are unable or unwilling to communicate orally in the new language (Krashen & Terrell, 1983); however, this silent period should not last indefinitely. Research shows that silence among ELs is often perpetuated because of the stigma and low expectations tied to EL status (Cummins, 1994; Gonzalez, Moll, & Amanti, 2005; Ho, 2005; Iddings, 2005). Further, well-meaning educators who confound language development with intellectual capacity often mistakenly deny ELs the types of cognitively rich learning opportunities that can promote second language development and academic achievement (Bunch, 2006, 2009; Chamot & O’Malley, 1989; de Jong & Harper, 2005; Gersten & Woodward, 1994; Moll, 1988). Missed opportunities for ELs include: participating in authentic discussions; using language in increasingly complex ways; clarifying, refining, and applying one’s thinking in interactive discussion settings; and collaborating in ways that support deep understanding of grade-level content (Swain & Lapkin, 1995; Valdés, Capitelli, & Alvarez, 2011). Scholars generally agree that ELs *do* face academic challenges that can be attributed to the sociocultural and sociolinguistic differences between them and students of the mainstream culture, yet perceiving these differences as “deficiencies” and lowering ELs’ academic expectations in discussion-based learning settings ultimately perpetuates a vicious cycle of silence and underachievement.

Finally, despite the CCSSs’ worthwhile, ambitious list of anchor standards in Listening and Speaking, successfully advancing “high levels of discourse” in today’s increasingly diverse “mainstream” classrooms remains a difficult undertaking (Kibler, Walqui, & Bunch, 2014; Michaels & O’Connor, 2011; Sohmer et al., 2009). The goals

delineated by the CCSS in English Language Arts call for further research on empirically based instructional strategies that support both ELs' and non-ELs' participation, reasoning, and extended interactions in whole class discussions in the mainstream classroom.

Study Significance

Given the enactment of the new CCSS and the growing linguistic diversity in classrooms, finding effective ways to meet the linguistic and academic needs of all students, including ELs, in today's "mainstream" classrooms is of paramount importance. Clearly, the advent of the CCSS provides us with an opportunity to rethink how both EL students and English-proficient students, learning side by side in today's classrooms, can best be supported in developing the language and thinking skills they need to participate equitably and successfully in the heightened levels of discourse that the CCSSI requires of them (Kibler et al., 2014). Although "productive talk" (Michaels & O'Connor, 2015) and "collaborative reasoning" (Zhang & Stahl, 2011) are associated with numerous positive learning outcomes for both ELs and non-ELs, methods of fostering quality talk among diverse learners in today's mainstream classrooms warrant further research.

In this study I investigated the instructional scaffolding strategies that support academic reasoning and extended interactions among diverse learners in today's classrooms. I used the DBR approach because it addresses questions of genuine interest to both educators and researchers, and it draws from both quantitative and qualitative methods to understand how and why theory-driven educational interventions work *in practice* (Anderson & Shattuck, 2012; Design-Based Research Collective, 2003). The

DBR approach makes this piece of scholarship more appealing to a wide audience as it is informed by the combined knowledge, practice, and voices of scholars, researchers, and expert practitioners.

CHAPTER 2:

LITERATURE REVIEW

This literature review is comprised of three parts. First, I provide a rationale for conducting Design-Based Research (DBR) and use the literature to develop the four-phase DBR approach used in this study. Next, I describe the theoretical framework that informs the study's proposed design. In this section, I address three main aspects of this framework: applying sociocultural theory to discussion-based learning, applying sociocultural theory to second language development, and conceptualizing academic language. Finally, I turn to the particular design choices implemented and studied in this dissertation, describing each feature and justifying each design choice with relevant literature.

Researchers generally agree that a gap exists between educational research and practice (Clark, 1988; Fenstermacher, 1986; Ginsburg & Gorostiaga, 2001; Handler & Ravid, 2001; Hoadley, 2004; Kincheloe, 2003, 2004; Lagemann & Shulman, 1999; Osher & Snow, 1997; Robinson, 1998; Stanovich & Stanovich, 2003; van Lier, 1994). A number of scholars have argued that two competing cultures in education are the main source of the divide: the culture of the theorist or researcher and that of the policy maker or practitioner (Clark, 1988; Ginsburg & Gorostiaga, 2001; Kincheloe, 2004). Clark (1988) attributed the divide in part to researchers who “pursue their own narrow and parochial interests, publish in obscure language in obscure journals, and avoid all discussion of practical implications of their work,” and in part to practitioners, who often perceive educational research as “irrelevant” to the real business of the classroom (p. 5).

This divide between educational research and practice has existed for decades.

As a result of this continuing divide, there has been a growing interest in breaking down the traditional barriers of theory and practice and in fostering partnerships between teachers and researchers in which both parties inform each other and build theories together through classroom-based research. Van Lier (1994) argued that such research involves researchers' "participation in the practical affairs of the field" (p. 338). Van Lier (1994) perceived theory building as a process that originates with the researcher but is then "put back into the service of process in practical affairs, and so on, in cyclical reflexive ways" (p. 338). Kincheloe (2003) contended that teachers should join the debate about what constitutes educational research by undertaking meaningful research—a promising avenue not only for bridging the divide between research and practice, but also for improving the quality of education and educational research. Stanovich and Stanovich (2003) have reminded us that *both* researchers and educators are "kindred spirits" that partake in a "what works" discovery process in their daily quests to improve educational practices (p. 35). Thus, it is through merging educational research and practice and redefining relationships between researchers and practitioners that true educational innovation and transformation can happen.

Design-Based Research

The DBR paradigm (Brown, 1992; Collins, 1992) has demonstrated considerable potential as an approach that integrates educational research and educational practice. The design-based research paradigm was advanced initially by Brown (1992) and Collins (1992), who conducted "design experiments" that were formative for testing and

improving educational designs based on principles derived from prior research. In their research, Brown and Collins addressed the theoretical and methodological challenges of studying learning in a rich, complex, and constantly changing classroom environment, and argued for a systematic methodology for conducting “design experiments” that involved working in real-world situations with teachers as coinvestigators.

The term DBR represents a research paradigm comprising many different labels including design experiments (Brown 1992; Collins, 1992); design-based research (Design-Based Research Collective, 2003); design research (Cobb, 2001; Edelson, 2002); and development research (van den Akker, 1999). Though DBR has gone by many names with slightly different versions in various fields (e.g., education, engineering), Wang and Hannafin (2005) proposed a definition that characterizes the broad nature of DBR in education:

a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories. (p. 6)

My interest in DBR as a central approach draws from the ways that researchers have used DBR methods to improve educational practices, while democratizing and increasing practitioners’ participation in research (Bergold & Thomas, 2012) and simultaneously developing “usable knowledge” (Lagemann, 2002). Below, I describe the features of DBR that most directly address my concerns with the research-practice divide as well as the development of design principles most useful to the educational and research context of this dissertation study.

First, DBR is *situated in practice*. Brown (1992), Collins (1992), and Reeves

(2000, 2006) described DBR as a methodology that requires addressing complex problems in real-world educational settings in collaboration with practitioners. Whereas traditional educational research methods are aimed at examining what works (i.e., efficacy), often *in a controlled laboratory setting*, DBR is concerned with understanding and documenting how and why the designed intervention or innovation works *in practice* (Anderson & Shattuck, 2012; Design-Based Research Collective, 2003; Plomp, 2013). Practitioners of DBR seek to trace the evolution of learning in complex, messy classrooms and schools, test and build theories of teaching and learning, and produce instructional tools that survive challenges found in everyday practice (Cobb, 2001). In addition, collaboration in situated practice—whether with a single classroom teacher or an entire school district—can significantly contribute to the development of theory and innovation. Moreover, without interactive collaborations among researchers and practitioners, interventions are unlikely to inform research and effect changes in real-world contexts (Wang & Hannafin, 2005).

DBR is *grounded in theory development and refinement*. That is to say that DBR is guided by theories of what is already known while further refining those theories by considering the conditions and elements of *context* that matter for teaching and learning. The aim of DBR is to integrate and improve both theory and practice; ultimately, the value of theory will be measured by the extent to which design principles inform and improve educational practice (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Wang & Hannafin, 2005). DBR can improve theory through “rich accounts of instructional interventions and their effects across multiple settings and in multiple areas of

instruction” (Design-Based Research Collective, 2003, p. 8). According to Cobb et al. (2003), DBR is guided by robust existing theory about teaching and learning and, in turn, develops “rigorous, empirically-grounded claims and assertions” that advance theory (Cobb et al., 2003, p. 12). In sum, DBR integrates known and hypothetical design principles to render plausible solutions to complex problems, and simultaneously informs the theory in which the study is grounded.

DBR is *flexible, iterative, and integrative*. In DBR, the initial intervention plan is purposely flexible so that designers can make deliberate adaptations when necessary. Early prototypes are tested, formally or informally, to see how well they address the issues in focus. Aspects of the design are repeatedly adjusted or refined until a design meets criteria. That is to say DBR typically involves the iterative design of a learning experience, with ongoing data collection used to refine the design and to understand why certain designed features of the learning environment are working and others are not. DBR is a methodology that requires conducting rigorous and reflective inquiry to test and refine innovative learning environments, as well as to define new design principles (Brown, 1992; Collins, 1992; Reeves, 2000, 2006). Researchers often use a variety of research methods from both qualitative and quantitative research paradigms to analyze an intervention’s outcomes, to refine those interventions, and to validate credibility—further validating its integrative and flexible nature (Wang & Hannafin, 2005). The integrative use of multiple methods may also change within phases of the study depending on the needs of the research.

A central goal of DBR is to *generate new and usable knowledge*. Researchers

using DBR systematically document the design process and create a design case, “a rich description of a problem analysis, a solution, and design procedures for a particular design experience” (Edelson, 2002, p. 117). The extended documentation garnered in the study is ultimately meant to inform and enhance its applicability to other contexts (Sandoval, 2004). DBR is sometimes identified as theoretical innovation grounded in specific experiences to create change (Brown, 1992; Cobb, 2001; Edelson, 2002). In sum, DBR is predominantly concerned with generating usable insights, knowledge about learning and teaching that is useful for the people involved in learning and teaching in everyday settings (Lagemann, 2002).

Overall, the DBR paradigm holds great potential for integrating educational research and practice. First, DBR attempts to build knowledge about and study solutions to the very complex nature of pedagogy in local settings through systematic research-driven efforts to improve practice (Bell, 2004). Second, DBR can potentially foster complementary collaborative partnerships between qualified educators and design researchers that bridge the divide between research and practice. That is, when collaborators—whether it is one single classroom teacher or a whole school district—are more than just willing participants, they can appreciably contribute to the development of theory and innovation (Bereiter, 2002). Third, DBR incorporates integrative research methods that balance quantitative and qualitative approaches to educational research. Finally, validity in DBR is based on its ability to allow scholars to explain real-world phenomena and to solve real-world problems (Barab & Squire, 2004), rather than on its replicability in an idealized laboratory setting.

Approaches to Design-Based Research

Though researchers vary in how they envisage DBR (and there is no single way to do it correctly), most would agree that a systematic plan generally consist of multiple iterative phases in which designers focus the problem, understand the problem, define goals, conceive the outline of a solution, build the solution, and test the solution (Amiel & Reeves, 2008; Anderson & Shattuck, 2012; Easterday, Lewis, & Gerber, 2014; Plomp, 2007; Reeves, 2006). The present study involved a flexible four-phase research framework. The idea was derived from Reeves (2006), who suggested that a DBR study should be conducted in four main phases: analysis, development, iterative cycles of testing and refinement, and reflection (Figure 1).

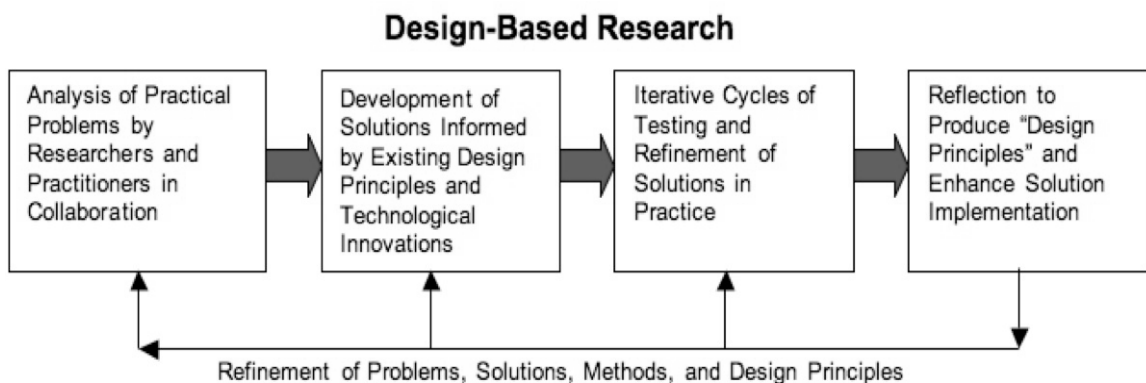


Figure 1. The Design-Based Research Framework (adapted from Amiel & Reeves, 2008, p. 34).

The Analysis of Practical Problems stage includes several steps. DBR begins with an analysis of the learning problem to be solved (Edelson, 2002). Education “problems” are typically defined in terms of some need experienced by a particular group. In the first phase, researchers and practitioners collaboratively conduct a needs

assessment and context analysis in order to identify the educational needs (Reeves, 2006). Typically a needs assessment can be informed by prior research that describes the needs of various subgroups within education; in addition, a needs assessment can be done through direct observation of a particular group.

Then, in the Development of Solutions phase, investigators conduct an initial round of relevant literature review in order to identify existing work and learning frameworks pertaining to the particular domain of inquiry and to develop a theoretical framework for the study. Next, investigators formulate a set of draft design principles and describe how they will be embodied in the learning environments. This learning solution is informed by existing research, theories, and design principles. In DBR, the initial design incorporates theoretical conjectures, or reasoned claims, about learning in the chosen context and how such learning can be supported (Sandoval, 2004). Investigators also prepare flexible guidelines for systematically implementing the codesigned intervention and for collecting and analyzing the data.

The Iterative Cycles of Testing and Refinement phase consists of enactment. This phase comprises data collection and involves iterative cycles of testing and the refinement of solutions in practice. Investigators implement the intervention and carry out a number of iterations of the materials and approach. In other words, elements of the design intervention and of research plans can be subject to change as they progress. Each iteration is a micro phase of the research and is followed by reflection, formative evaluation, and revision aimed at improving the intervention (Plomp, 2007). These micro iterations serve as small modifications made to the overall design, and can include the

implementation of a new learning activity, a type of assessment, a particular scaffold (linguistic, conceptual, cultural, or social), or/and a technological intervention to subsequent lessons—and each lesson in and of itself also constitutes an iteration within the larger scheme of the intervention. Iterations at the macro-level, on the other hand, generally refer to changes to the main design cycle (e.g., theory building; designing; analytic methods) when implemented in other contexts.

In the final Reflection to Produce “Design Principles” phase, researchers aim to determine how the outcome of the investigation meets the predetermined specifications of solving the problem, using empirical methods. Investigators may generate recommendations for future work in this phase. According to Plomp (2007), DBR is a cyclical process: “analysis, design, evaluation and revision activities are iterated until a satisfying balance between ideas (‘the intended’) and realization has been achieved” (p. 13), which finally results in reflections that produce design principles and enhance the implementation of solutions in practice. Additionally, in this last phase, investigators aim to generate refined principles for conceptualizing learning and instruction in order to help communicate relevant implications to practitioners and other educational designers (Design-Based Research Collective, 2003; Plomp, 2013).

The model in Figure 1 reflects the cyclical nature of the “refinement of problems, solutions, methods, and design principles” (Amiel & Reeves, 2008, p. 34), requiring practitioners and researchers to engage collaboratively in the DBR process in a natural setting. It is the structure that I adopted to guide this work.

Connections Between DBR and the Professional Learning Community Model

DBR is compatible with and differs from modes of action research that are often taken up in schools. This is especially pertinent as the elementary school where I conducted the DBR investigation was engaged in a particular mode of action research. The school was engaged in a district-wide, staff-driven, professional project based on DuFour, DuFour, Eaker, and Many's (2006) professional learning community (PLC) model for transforming schools into results-oriented professional learning communities. The primary objective of the PLC model is to ensure not only that students are taught well, but also that students are learning well (DuFour, DuFour, Eaker, & Karhanek, 2010). In other words, the focus is not only on teaching methods, but also on results. DuFour et al. (2006) suggested that school staff ask themselves key questions such as: What practices and characteristics of school have helped students achieve at high levels? How can such practices and characteristics be adopted in our school? What commitments must we make in order to help each other in creating such a school? What indicators could we monitor to assess our progress? Staff members are encouraged to engage with colleagues in the ongoing exploration of these questions. In sum, the PLC model is an action-oriented improvement plan, in which teachers are required to collaborate with colleagues and engage in collective inquiry, dialogue, and experimentation in order to deepen knowledge and improve teaching practices.

The DBR approach resembles some of the action-oriented features of the PLC model. Some of these shared features include (a) a shared mission, vision, and values; (b) commitment to improving educational practices in local teaching and learning

settings; (c) teacher-learning teams engaging in collaborative inquiry; (d) action orientation (i.e., learning by doing); (e) implementing interventions to solve realistic problems; and (f) results orientation (i.e., assessment based on results rather than intention) (DuFour et al., 2006).

That said, there are also clear distinctions between the collaborative inquiry culture of PLCs and DBR. First, DBR involves a partnership between teachers and researchers, whereas PLCs involve “teacher teams” engaged in collective inquiry. In addition, in DBR, researchers, rather than practitioners, usually take the initiative in the research process in terms of determining the overarching research questions, the research design, and the scope of the study (Wang & Hannafin, 2005), and then the researchers and practitioners work to mutually inform one another during the course of the investigation. Finally, unlike some less-formal types of action-oriented research, DBR is strongly based in prior research and theory and usually incorporates rigorous methods from both qualitative and quantitative research paradigms to test and build theories of teaching and learning (Collins, Joseph, & Bielaczyc, 2004; Shavelson, Phillips, Towne, & Feuer, 2003; Wang & Hannafin, 2005).

To summarize, this DBR approach used in this study comprised an interactive, iterative, and flexible four-phase research framework. Based on Amiel and Reeves’s 2008 DBR model, the approach involved a process in which researchers and practitioners together identify and analyze problems; develop solutions informed by theories and existing design principles; reflect upon, test, and refine solutions in practice to produce design principles and to enhance the implementation of solutions in practice. In addition,

the approach integrated some of the features of the PLC model in place at the local school, which required teachers to engage in a reflective process of structured debriefing and problem solving in collaboration with others in a professional learning community.

Because DBR is based on theory and theory refinement, it is important to understand both the overarching theoretical framework and principles and the more specific design principles that guided this study. I next turn to describing the theoretical framework that guided the specific design principles that were put into place as well as the analytic framework applied to understand how the designed learning environment was working.

Theoretical Framework

In this theoretical framework, I present the sociocultural view of teaching and learning, I examine second language development through the sociocultural lens, and I explore the various ways in which academic language has been conceptualized. Later in Chapter 2, I draw on the literature from this theoretical framework in order to describe and to provide a rationale for the design choices implemented in this DBR study.

Sociocultural Theory

In his explanation of sociocultural theory (SCT), Vygotsky (1962) posited that learning and higher mental functions initiate from our interactions and communications with others. He wrote, “All that is internal in the higher mental functions was at one time external” (Vygotsky, 1991, p. 36). Actually, Vygotsky considered mental functioning as a mediated process between a human’s psychological and social worlds. Vygotsky (1962) theorized that learning in school settings takes place through the interactions that

students have with their peers, teachers, and other experts.

In Vygotsky's SCT, learning is inherently a social process that is activated through the zone of proximal development (ZPD). Vygotsky's concept of ZPD refers to the "distance between the actual development 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" (Vygotsky, 1978, p. 86). Vygotsky made an important distinction between "actual" level of development (what a learner can do independently) and "potential" level of development (what a learner can achieve with the assistance provided by a more skilled or knowledgeable other). The ZPD has clear implications for teaching. Newman, Griffin, and Cole (1989) referred to the ZPD as a "construction zone" and defined it as the changes that take place in socially mediated instructions (p. 2). Vygotsky was mainly interested in tapping into that learning space (the ZPD) to help learners develop new skills, concepts, and levels of understanding.

Scaffolding in SCT. The ZPD is often used in tandem with the term *scaffolding* (Wood, Bruner, & Ross, 1976). Wood et al. (1976) defined scaffolding as "those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (p. 90). Scaffolding is directly related to ZPD in that it is the support mechanism that helps learners successfully reach new understanding and competencies. Rush, Eakle, and Berger (2007) explained how instructional scaffolds can include both the curricular materials and the teaching process. Coleman and Goldenberg (2012)

provided examples of scaffolding strategies, which include building background knowledge, explicit instruction, linguistic supports, visuals, repetition, role-play, the use of primary language, and peer interactions. The purpose of scaffolding is to ease the negative emotions and self-perceptions (e.g., frustration, intimidation) that students may experience when endeavoring to perform a difficult task without the assistance, direction, or understanding they need to complete it. The teacher's role in scaffolding the task may be reduced over time as new levels of development are attained, and as students eventually develop greater independence in the learning process (Vygotsky, 1978; Young & Miller, 2004).

Varieties of scaffolding include cultural, social, linguistic, and conceptual (Pawan, 2008). Cultural scaffolding involves acknowledging and accessing students' prior knowledge, experiences, and learning styles in order to support learners in successfully navigating different cultural classroom practices (Pawan, 2008). Social scaffolding (e.g., group work, teacher–student one-to-one assistance, etc.) is when teachers assist students in learning how to engage in activities that involve social skills in an academic setting. Linguistic scaffolding (e.g., explicit instruction of vocabulary, simplified language, etc.) occurs when teachers assist students in learning how to use language to interact in a particular academic setting or to carry out a task using the literacy practices of a particular discipline. Conceptual scaffolding (e.g., modeling, think-alouds, etc.) is when the teacher assists the students in understanding the specialized concepts that are being taught (Pawan, 2008).

Reasoning. Additionally, sociocultural theory, particularly from Vygotskian tradition, posits that individual reasoning ability has its origin in dialogue with others, through the particular ways of participating in specific social contexts and ways of using language (Wertsch, 1991). Early cognitive research by Inhelder and Piaget (1958) focused on the shifts to formal operational thinking that occur around age 11 or 12 and are marked by the ability to use abstract thinking (e.g., deductive reasoning, hypothetical thinking). Vygotsky's model of development through internalization, however, emphasizes that "all that is internal in the higher mental functions was at one time external" (Vygotsky, 1991, p. 36). Rogoff (1990) perceived this process of internalization as a process of cultural development that results from cognitive apprenticeship. Other scholars whose work is grounded in SCT have argued that reasoning is a form of social practice in which children learn to think and speak in certain ways as a result of being inducted into social practices and ways of using language (e.g., exploratory talk, accountable talk) by their teachers (Boyd & Kong, 2017; O'Connor & Michaels, 1993; Resnick, Salmon, Zeitz, Wathen, & Holowchak, 1993; Soter et al., 2009; Wegerif & Mercer, 2000; Wertsch, 1991).

In this study, instructional scaffolding relates to the conversation that the student(s) and teacher have as part of the learning situation, as well as the scaffolding strategies used to facilitate effective discussion among culturally and linguistically diverse learners in the mainstream classroom. This entails dialogue in which the teacher uses instructional discourse in ways that shape opportunities for students to participate, reason, engage with the ideas of their peers, and use academic language to perform the

functions that comprise productive discourse settings. In other words, teachers can frame discussions in a way that maximizes learners' opportunities to use extended discourse, reason with one another, and use language in school-appropriate ways, while simultaneously monitoring student understanding and progress. In turn, the conversation serves as a form of scaffolding for learning, in that students have opportunities to develop reasoning skills and use language in ways that demonstrate their disciplinary understanding. Therefore, SCT is one conceptual lens for understanding how class discussion, coupled with effective supports in the form of instructional talk moves and academic language scaffolding, can serve as a rich community of practice (Lave & Wenger, 1991) that shapes individual student learning in powerful ways.

Applying Sociocultural Theory to Second Language Development

In the sociocultural view of second language acquisition, scholars have recognized that fostering oral proficiency through meaningful talk is vital to second language development (Bruner, 1986; Hite & Evans, 2006; Johnson, 2004; Lantolf, 1994, 2000, 2006; Long, 1996; Newman & Holzman, 1993; Pica, 1994; Swain, 1985, 1995; Toohey, Waterstone, & Julé-Lemke, 2000). In Vygotsky's theory, language acquisition "provides the paradigm case" of learning leading development, because in this activity the "aspirant speaker must 'borrow' the knowledge and consciousness of the tutor to enter a language" (Bruner, 1986, p. 78) through the fundamentally human process of meaning making in collaborative activity with other members of the community (Newman & Holzman, 1993, p. 87). Researchers adopting a sociocultural view have treated language development as originating in the social interactions and relationships

between people via participation and meaningful oral interactions in a variety of communicative learning contexts (Donato, 1994, 2000; Foster & Ohta, 2005; Gánem Gutiérrez, 2008; Lantolf, 1994, 2000; Lantolf & Thorne, 2006; Pica, 1994; Smith, 2007; Snow, 1999; Swain, 1985, 1995; Swain & Lapkin, 2002; Zhang & Stahl, 2011).

The sociocultural view is unlike traditional approaches to language teaching and learning rooted in Chomsky's notion of linguistic competence, in which language is perceived as a system of rule-governed, hierarchically arranged structures (Chomsky, 1965). In SCT, linguistic development is a byproduct of learning to use language in discourse, focusing on *meaning*—"not stimuli and responses, not overtly observable behavior, not biological drives and their transformation, but meaning" (Bruner, 1990, p. 2). Thus, teachers can facilitate second language development by providing students opportunities for meaningful, interactive, reasoning-focused classroom talk (Gee, 2005, 2012; MacDonald & Molle, 2015).

In the sociocultural view of language development, students gain the linguistic competence (Chomsky, 1965) to participate in these social practices through interactions and practice with more knowledgeable others, and this competence eventually becomes part of students' cognitive resources (Hymes, 1966; Vygotsky, 1987). When a learning context requires learners to engage in meaningful interactive discussion (Long, 1996) with more knowledgeable others, learners are naturally pushed to "produce more comprehensible, coherent, and grammatically improved discourse" (Gibbons, 2006, p. 15). In studies investigating how children acquire English, Fillmore (1989) discovered that students are more likely to succeed at acquiring English when they interact directly

and frequently with people who know the language well enough to show how it functions and how it can be used. Fillmore and Snow (2000) noted, “Expert speakers not only provide access to the language at an appropriate level, they also provide access to what the units in the language are and how they combine to communicate ideas, information, and intentions” (p. 33). Thus, when a teacher effectively facilitates rich discussion that includes both ELs and English-proficient learners, it can help students who are developing proficiency in English reach new levels within their ZPD.

Moreover, Swain (1985, 2000) asserted that “comprehensible output,” in which language is produced in order to process language more deeply, is just as important as “comprehensible input” (Krashen, 1987), in which language acquisition occurs when the learner is exposed to level “I + 1,” the learner’s interlanguage plus the next stage in language acquisition. In one study, Swain (2000) described the way two eighth-grade French immersion students collaborated in dialogic interaction to resolve linguistic issues. Swain (1985) proposed that “producing language may be the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intended message” (p. 247). In other words, dialogic interactions give learners the opportunities to “notice” (Schmidt, 1990) linguistic features, resolve linguistic problems, and develop their language abilities.

Sfard (1998) proposed two metaphors for learning that can be applied to second language learning: the acquisition metaphor (AM), grounded in cognitivist theory, and the participation metaphor (PM), grounded in SCT. In the AM, the focus of learning is on the accumulation of knowledge as if it is a material commodity. In the PM, however,

learning is “a process of becoming a member of a certain community” (Sfard, 1998, p. 6). With reference to second language acquisition, the AM centers on the accumulation of a new set of grammatical, lexical, and phonological forms. The PM, on the other hand, perceives language development as originating in the social interactions and relationships between people via participation in a variety of communicative contexts (Lantolf & Thorne, 2006).

In Canale and Swain’s (1980) model for communicative competence, these scholars emphasized sociolinguistic competence—the learner’s ability to use language appropriately in various social contexts—as a key component of communicative competence. Wolfson (1989) helped us better understand sociolinguistic competence: “Each community has its own set of conventions, rules, and patterns for the conduct of communication, and these must be understood in the context of a general system which reflects the values and the structure of society” (p. 2). Thus, it is fair to say that for students to gain communicative competencies, they need to be exposed to and practice the language functions and conventions of a particular setting. Moreover, for talk to build communicative competence, learners need to do more than supplying one-word answers or isolated sentences (verbatim from text): Students need to be actively engaged in meaningful, extended discourse in authentic discourse settings.

MacDonald, Miller, and Lord (in press) supported the “language as action” approach (van Lier & Walqui, 2012) grounded in SCT and argued that language development is driven by students’ “authentic, context-based need for language” (p. 5) and can be facilitated through “classroom activities that provide students opportunities to

engage in disciplinary practices” (p. 6). As Heritage et al. (2015) affirmed, “Only an emphasis on language as action . . . engages students in the meaningful learning of new disciplinary practices while simultaneously strengthening their language uses in those practices” (p. 32). Lee, Quinn, and Valdes (2013) stated that students’ language development is fueled by “meaning-making, on hearing and understanding the contributions of others and on communicating their own ideas in a common effort to build understanding” (p. 226). Gee (2012) argued that it is critical that ELs participate in the discourse practices of the mainstream community to advance their language development. Nevertheless, both “language as action” and “the participation metaphor” remain undervalued in public schools today (Johnson, 2004).

Finally, language development and cognitive development are often mistakenly considered as separate entities with little bearing on one another. Adherents of SCT have purported that “language and cognition develop together and progressively. As ideas and relationships become more complex, so does language” (Walqui & Heritage, 2012, p. 2). In other words, providing ELs with equal access to the same grade-level content through effective instruction, while simultaneously providing scaffolded instruction that requires them to engage in reasoning-focused discourse and higher-level thinking is important not only for propelling content learning, but also L2 development.

In sum, within the framework of sociocultural theory is the notion that second language development is most effective when

- language instruction is no longer envisioned as the teaching of discrete elements of a second language (e.g., verb tenses, vocabulary) isolated from context of

meaningful and engaging academic work;

- explicit focus on language occurs in conjunction with, and in the service of, meaningful academic work;
- students have opportunities to interact in meaningful ways with more knowledgeable others in a variety of authentic contexts;
- students are provided with scaffolded opportunities to practice using language and academic registers in ways relevant to the discourse practices of their school communities; and
- language and cognition develop together; thus, students are provided with scaffolded opportunities to engage in reasoning-focused discourse.

Engaging ELs in effective, whole class, collaborative discussion (as defined by the CCSS) can potentially activate all of the above principles of language development.

Conceptualizing Academic Language

In the following section, I review some of the ways in which academic language has been conceptualized, prior to looking more specifically at the particular focus of academic language for this study. Though there is no official or formal definition, academic language broadly encompasses the language needed by students to do the work in schools (and later in the workplace). Although the academic language term is often applied to students who are developing their proficiency in English, the Common Core State Standards place significant academic language demands on students as a whole, as all students need to acquire academic language to thrive in academic settings. In the following paragraphs, I draw on extant literature to explore the multiple and complex

features of academic language.

With regard to second language development, Cummins (1979, 2000, 2008) has distinguished between two kinds of language proficiencies, basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP). BICS refers to language proficiency that is necessary for communicating in cognitively undemanding social situations, such as in the cafeteria or on the playground. CALP, on the other hand, refers to more abstract, complex, and context-reduced language that eventually permits ELs to access grade-level content and to participate successfully in both oral and written modes in academic disciplinary settings. Cummins (2000) has argued that many ELs are fluent in the conversational English needed for everyday interaction, but have difficulty navigating the more cognitively demanding genre of English used in textbooks, classrooms, and other academic contexts. It is generally agreed that BICS skills are usually acquired in the ELs' first few years in the United States, but academic English skills are acquired after at least 7 years in the country (Cummins, 2008). The distinction between BICS and CALP remains controversial: for one thing, the boundary between BICS and CALP may not always be cut and clear as the language of learning and thinking can traverse both arenas; additionally, the BICS and CALP distinction is sometimes criticized for not considering the more complex nature of language varieties and multiple literacies (Scarcella, 2003; Valdés, 2004). Cummins nonetheless made an important and useful distinction between the context-reduced, cognitively demanding nature of academic language and the context-embedded, cognitively undemanding nature of conversational English that is helpful for

understanding the complex demands of academic language and for helping students meet those demands.

Nagy and Townsend (2012) examined recent literature to provide a broad, all-encompassing definition of the academic language important for all students' success in schools. They used the metaphor of "words as tools" and emphasized that academic language should not be taught as "just individual words," but rather as "specialized language, both oral and written, of academic settings that facilitates communication and thinking about disciplinary content" (p. 92). Nagy and Townsend purported that features of academic language can include content-specific vocabulary; informational-dense language; a higher proportion of nouns, adjectives, and prepositions; Latin and Greek vocabulary; morphologically complex words; nominalizations; rhetorical devices (e.g., imagery, metaphor, repetition); complex sentence structures with embedded relative clauses; sophisticated organizational strategies used to communicate complex ideas; variation in the terms used to refer to the same person or idea; and the passive voice (Biber, 2006; Fang, 2006; Halliday, 1998; Nagy & Townsend, 2012; Scarcella, 2003; Schleppegrell, 2012; Snow & Uccelli, 2009; Zwiers, 2008). Moreover, Nagy and Townsend emphasized that academic language development "must occur in authentic contexts, with students having many opportunities to learn how target words interact with, garner meaning from, and support meanings of other words" (p. 98). Nagy and Townsend drew on a recent body of scholarship (Fang & Schleppegrell, 2008; Graves, 2006; Stahl & Nagy, 2006; Zwiers, 2008) to conclude that fostering these various features of academic language goes far beyond the usual idea of direct instruction.

Instead, it “consists largely in providing students with multiple opportunities to use the instructed words, both receptively and productively, generally in the context of discussion about academic content” (Nagy & Townsend, 2012, p. 98).

Other scholars have identified academic language from the perspective of language functions. Dutro and Moran (2003), as well as Tretter, Ardasheva, and Bookstrom (2014) used the metaphor of “bricks and mortar” to clarify the functions of such language. While the bricks in this metaphor represent vocabulary specific to the content and concepts being taught, the mortar represents the words and phrases that connect the bricks and are equally important components of academic language (e.g., connectors: *because*, *therefore*, *however*; prepositions and prepositional phrases: *in*, *on*, *in front of*; general academic vocabulary: *analyze*, *compare*, *prove*).

Kinsella (2005) and Zwiers (2008) also described academic language from the perspective of language functions. Academic language encompasses language functions needed to meet the language demands of a specific academic task (e.g., comparing, summarizing, generalizing, sequencing events, describing, persuading, agreeing/disagreeing, hypothesizing, etc.). Increasing competence in any language functions obligates the speaker or writer to use increasingly complex language and structures to participate in content learning, instead of waiting to master language before one can participate in academics, by supporting them to put ideas together in a wide array of ways. In this respect, language functions serve as tools that support content learning and participation in disciplinary settings (Kinsella, 2005; Zwiers, 2008).

In Scarcella’s (2003) comprehensive conceptual framework for understanding and

analyzing academic English relevant to K–12 teaching contexts, she examined the relationship between everyday English and academic English across three dimensions: linguistic (phonological, lexical, grammatical, sociolinguistic, and discourse components); cognitive (knowledge/schema, higher order thinking, strategic, metalinguistic components); and sociocultural/psychological (norms, values, beliefs, motivations, interests, practices, and habits). The linguistic dimension includes (a) the *phonological component* encompassing knowledge of the pronunciation of consonants, vowels, consonant clusters, words stress, and intonation patterns; (b) the *lexical component* comprising knowledge of vocabulary and how and when to use words (e.g., prefixes, roots, suffixes, parts of speech, as well as the contextual constraints governing words); (c) the *grammatical component* including the accurate use of morphological and syntactic forms and uses of language (e.g., command of verb tenses, subject-verb agreement, the use of definite and indefinite articles, modal auxiliaries, sentence structures, etc.); and (d) the *sociolinguistic component* covering knowledge of speech styles used in particular social contexts (“register”) as well as competence in use of the various language functions (e.g., to persuade, summarize, justify, hypothesize, give examples, etc.) necessary for participating in disciplinary learning. The cognitive dimension includes knowledge/schema theory; higher order thinking skills; strategic competence (i.e., strategies such as use of context clues that may be called on in order to improve progress in developing language); metalinguistic skills, which is the ability to think about language use in order to improve linguistic performance (e.g., students consciously use grammar rules to correct their speech). The sociocultural and

psychological dimension comprises norms, values, beliefs, motivations, interests, practices, and habits associated with defining and understanding academic language.

Moreover, Scarcella (2003) described academic English as a form of language that is “needed to challenge the tenets of those in power who use it . . . without knowledge of academic English, individuals may be excluded in participation in educated society and prevented from transforming it” (p. 1). Kanno and Kangas (2014) have also argued that proficiency in academic language is a form of linguistic capital that “has to be developed through pedagogical training in the school” (p. 853). Thus, the teaching and learning of academic language has also been described as an equity imperative.

Finally, in the assets-based, “language as action” perspective (van Lier & Walqui, 2012), which draws from sociocultural theory, academic language is not perceived as discrete language skills taught in isolation from academic work but rather, language is developed through meaningful engagement in academic tasks. Students come to know academic English and to engage with academic registers through shared experiences during which participants use language to construct knowledge and engage in sense making together (Gee, 2005; MacDonald & Molle, 2015). In other words, academic language is not something that simply comprises mastery (on an inner cognitive level) of intricate syntactic structures and morphologically complex vocabulary words before one can be “ready” to use them. Instead, academic language resides in shared, meaningful experience and is fostered through engagement in academic discourses. As MacDonald et al. (in press) described, academic language development is “driven by students’ authentic, context-based need for language that is more clear or precise or objective or

nuanced” (p. 5). Thus, this view of language operates in a sociocultural context—not in isolation—and the classroom environment often serves as the sociocultural context for learning academic language where distinct communities of practice with established social, academic, and cultural ways of being (Lave & Wenger, 1991) use language in particular ways.

As explored in this section, academic language is complex and encompasses a broad range of linguistic, cognitive, and sociocultural dimensions (Scarcella, 2003), not to mention a wide range of theories explaining best approaches for developing academic language. For this study, I primarily draw on van Lier’s and Walqui’s (2012) “language as action” perspective as well as Scarcella’s (2003) sociolinguistic component of academic language competence in use of the various language functions necessary for participating in disciplinary learning. In the next section, the Proposed Design, I draw on this literature in order to provide further detail on as well as a rationale for the academic language focus of this particular DBR study.

Summary

In this theoretical framework, I presented the sociocultural view of teaching and learning, I examined second language development through the sociocultural lens, and I explored the various ways in which academic language has been conceptualized. In the ensuing section, I rely on the literature from this chapter to describe and to provide a rationale for the design choices implemented in this particular DBR study.

The Proposed Design

Grounded in sociocultural theory as it pertains to education and second language development, we codesigned an intervention informed by the literature on “Academically Productive Talk” (Chapin et al., 2009); “Academically Productive Talk Moves” (Michaels & O’Connor, 2011); the “Language as Action” perspective (van Lier & Walqui, 2012); and Scarcella’s (2003) sociolinguistic, discourse component of academic English. The codesigned intervention included four components, each informed by design principles that were developed for this intervention:

1. Implementing “Academically Productive Talk” (APT) strategies to support participation, reasoning, and dialogic discourse for all students and to shape opportunities for second language development.
2. Explicit teaching of academic language functions for communicating and thinking in discussion contexts in tandem with multiple opportunities to practice.
3. Extending discussion across multiple texts under a single theme to support critical thinking in discussions.
4. Implementing self- and peer assessment to promote evaluation of progress and goals—and to support productive discourse.

Although the third and fourth design components were important to the codesigners and part of the initial design, I will not focus on these components in the analysis for this dissertation. I am including them here only to provide a complete picture of the design and of the instructional context of this study.

Design Choice 1: Implementing APT Moves

The first design choice was to implement “Academically Productive Talk” (APT) strategies in order to veer away from traditional IRE sequences and to support participation, reasoning, and dialogic discourse for all students while also shaping opportunities for second language development. Additionally, this was important for planning purposeful discussions with objectives that aligned with the four APT goals.

The limitations of the IRE discourse pattern. Although educational researchers have long argued for the value of talk in the classroom for fostering understanding and language development (Alexander, 2008; Bakhtin, 1981, 1986; Gibbons, 2006; Goldenberg, 2008; Hyland, 2000; Lemke, 1990; Mercer, 1995; O’Connor & Michaels, 1993, 1996; Wells, 1999), they have also grappled with identifying the kinds of talk-based strategies and discourse patterns that are most effective for promoting understanding. Goffman (1974, 1981) suggested that classroom discourse patterns relegate a particular “status” to all those involved in the “participation framework” (Goffman, 1974, 1981; Goodwin, 1990). Goodwin (1990) furthered this notion when she explained that teachers determine the “rights” and “responsibilities” of participants in a discussion to create a “participation framework.”

Traditionally, whole class academic discussions have been framed around a discourse pattern in which the teacher asks leading questions and students try to respond with the “right” answer. Linguists identified this discourse pattern as IRF or IRE, a sequence of steps consisting of teacher initiation, student response, and teacher feedback or evaluation (Mehan, 1979; Sinclair & Coulthard, 1975). In the IRF/IRE discourse

pattern, the educator holds status as the primary keeper of knowledge. This “participation framework” is often criticized for being a monologic, unidirectional, teacher-centered form of discourse, in which the learner says what the teacher wants to hear rather than communicating his or her reasoning (Lemke, 1990; Nunan, 1991; Nystrand, 1997; Walsh, 2002; Wells & Arauz, 2006). Although the IRF/IRE sequence can be useful in specific learning contexts for which knowledge delivery and clarification by the expert is necessary to advance learning, its efficacy ultimately depends on the nature of the learning goals (Mortimer & Scott, 2003; O’Connor & Michaels, 2007; Sohmer et al., 2009). For example, IRF/IRE interactions may be suitable when a teacher is primarily concerned with eliciting a previously taught key term, a fact, or a linguistic structure; giving instructions; or setting the stage for a task. The IRF/IRE discourse pattern falls short, however, when the aim is to create a dialogic learning environment in which students are provided with space to participate, reason, justify, and negotiate meaning about the concepts they are learning.

The inclusion of ELs in mainstream classrooms calls for increased attention on how IRE discourse patterns can be doubly limiting for students who are also developing second language proficiency. Research has shown that interaction is critical for promoting both L2 and content learning outcomes (Mercer, 1995, 2002; Nunan, 1991; van Lier, 2004; Walsh, 2002; Zhang & Stahl, 2011). IRE discourse patterns limit learners’ opportunities to interact, verbalize complex reasoning, and produce extended discourse in their non-native language, all key elements to L2 development. In the field of second language acquisition, a discussion-based, dialogical approach based on

Vygotsky's and Bakhtin's ideas has been described as "a unique opportunity to heal the schism that currently separates the second language learner's social environment from his or her mental functioning" (Johnson, 2004, p. 170). Perez (1996) noted that in such "instructional conversations," the teacher facilitates participation and higher-order thinking through "conversational uptakes, connective comments that respect the student and afford linguistic scaffolds that foster more and better discussion of academic topics" (Perez, 1996, as cited in Mohr & Mohr, 2007, pp. 441–442). Gibbons (2006) explained how dialogic exchanges afford students greater freedom of expression:

Unlike the IRF sequence, which frequently closes off the exchange and sandwiches the student's contributions between the two controlling moves by the teacher, dialogic interactions have the potential to build up to a discourse sequence and hence open up the discourse in ways which are likely to enable second language development. (p. 117)

She further explained that teachers' careful facilitation involves recasts and open-ended questions to propel dialogue forward and to promote greater participation, interaction, rigorous thinking, and language development among ELs.

Implementing APT goals and moves for productive discussion. In the present study, we implement the Chapin et al. (2009) model in order to use research-based strategies to promote a discussion environment in which students are encouraged to listen to and build on each other's comments. Their model comprises four foundational goals that underpin "academically productive talk": (a) helping individual students share their own thoughts by gently pressing for clarification, elaboration, and explanation; (b) helping students orient and listen carefully to one another; (c) helping students deepen their reasoning by asking for evidence for claims and arguments; and (d) helping students

engage with and build on the reasoning of others and encouraging them to interpret and use each other’s statements. Table 1 summarizes the APT scaffolding framework and includes the four goals, the nine talk moves associated with the goals, and examples from discourse.

Table 1

“Academically Productive Talk” (APT) Scaffolding Framework

APT Goal	APT Moves	Example
1. Help individual students share, expand, and clarify their own thinking.	Time to think; Say more; So, are you saying...	“Okay, can you say a little more about that?” “Well, what do you mean by that?” “So, are you saying global warming isn’t a <i>serious</i> threat?”
2. Help students listen carefully to one another.	Rephrase/Repeat	“Okay, who can say what Mia said in a different way?” “Can anyone repeat or paraphrase what Tomas just said?”
3. Help students deepen their reasoning.	Ask for evidence or reasoning.	“Why?” “How did you come to that conclusion?” “Do you think it always works that way?” “What evidence do you have to support that point?”
4. Help students think with others’ ideas.	Agree/Disagree; Add on; Explain what someone else means.	“Who agrees or disagrees with what Anna said, and why?” “Does anyone want to explain what Anna means?” “Who has something to build on/add to what Anna just said?”

Note. Adapted from Chapin, O’Connor, & Anderson, 2009.

O'Connor and Michaels (1996) argued that for students to gain facility in school-based thinking and speaking practices, “they must receive social support in the form of scaffolded opportunities to perform and practice in relevant ways of talking and thinking” (p. 2) appropriate to learning in schools. O'Connor and Michaels (1993, 1996, 2015) qualitatively investigated and depicted a number of disciplined “talk moves” used by accomplished teachers to facilitate “academically productive” classroom discussions (Michaels et al., 2008; O'Connor et al., 2015).

“Talk moves” are defined as “families of utterances that help teachers in the moment-to-moment micro-interactional challenges of orchestrating student discussion” (O'Connor et al., 2015, p. 2). These utterances have several functions. They are (a) interactional, in terms of positioning speakers or specific academic content in the structure of the discussion; (b) socializing or intellectual, in terms of helping learners express their views and reason with others; and (c) linguistic, in terms of serving a language function (Michaels & O'Connor, 2015). O'Connor and Michaels (1996) found that these instructional moves play an important role in “shifting the discourse pattern” so that learners can take on “the particular roles and discourse forms that are valued in problem posing and problem solving in school” (p. 63).

APT moves include (a) giving students time to think; (b) prompting students to say more; (c) revoicing (e.g., “So are you saying . . . ?”); (d) asking students to rephrase or repeat someone else’s reasoning (e.g., “Can anyone repeat what Tommy said?”); (e) asking students to explicate their reasoning and provide evidence (e.g., “What evidence do you have to support that point?”); (f) challenging or providing a counter-example to

press students for further reasoning (e.g., “Does it always work that way?”); (g) asking students to agree or disagree with others (e.g., “Does anybody disagree with that claim?”); (h) asking students to apply their own reasoning to someone else’s reasoning (e.g., “Can anyone take that suggestion and push it a little further?”); and (i) asking students to explain someone else’s thinking (e.g., “Who can explain what Jen means when she says . . . ?”) (Michaels & O’Connor, 2011; see Table 1). When used skillfully and strategically, talk moves can serve as tools to help teachers respond to the challenges they face in facilitating discussions and help foster meaningful student learning (Michaels & O’Connor, 2011).

Studies have shown that APT moves not only bolster the development of students’ reasoning skills, but also result in content learning gains (Chapin & O’Connor, 2012). In Project Challenge (Chapin & O’Connor, 2012), conducted in one of the lowest performing urban school districts in Massachusetts, students were challenged to go beyond simple mathematical computation and to explain their mathematic thinking through “productive” discourse. The intervention was given to four cohorts of 25 students each, beginning in the fourth grade and lasting 4 years. After one year, 57% of Project Challenge participants scored in the “advanced” or “proficient” ranges on the MCAS, compared to 38% in Massachusetts overall. After two years, students in Project Challenge were scoring better than 87% of students in the normal sample for the California Achievement Test of Mathematics. In addition, at the end of sixth grade, over 82% of each Project Challenge class scored “advanced” or “proficient” on the Massachusetts Comprehensive Assessment System (MCAS) mathematics test. Finally,

in a post-hoc, quasi-controlled comparison of students who had been eligible for Project Challenge but were not selected, the differences between Project Challenge students and their matched controls were significant and effect sizes were large (1.8). The evidence from Project Challenge suggests that reasoning-based discourse promotes students' general competencies in math and has implications for how discussion can promote subject knowledge more generally.

In another study, teachers participated in a 10-week professional development (PD) program called *Talk Science* (Michaels & O'Connor, 2011) aimed at helping teachers promote scientific reasoning through purposefully planned discussion. The participants included 11 fifth-grade teachers from five schools in the northeastern United States. Researchers collected science interviews, talk interviews, classroom discourse, and study group meetings from 14 science classrooms. The Talk Science program included video-rich cases that focused on effective scientific discussion, video-rich cases that helped teachers become familiar with the rationale for "Accountable Talk" in the science classroom, and the implementation of the nine APT moves (Michaels & O'Connor, 2011). The findings of the study indicated that through participation in the program, changes occurred in teachers' knowledge, perspectives, and practice. Teachers began to incorporate discursive strategies in ways that shifted the

In sum, we implemented the Chapin et al. (2009) model in order to shape a discussion setting in which students clarify their ideas; to probe and deepen expressed reasoning; and to help students apply their thinking to others' ideas. These studies shed light on (a) the critical roles that both instructional discourse and participation in

“Accountable Talk” play in fostering reasoning and content learning among students; and (b) the importance of teachers adopting an analytic stance in their use of discursive strategies to support productive talk and to guide students’ learning. We drew on this body of knowledge and these lines of research to support Design Choice 1.

Design Choice 2: Academic Language Development

The second choice involved the explicit teaching of academic language functions for communicating and reasoning in discussion contexts in tandem with multiple opportunities to practice using the language in an authentic and meaningful context. This involved determining what particular language to support and how to support it. Below, I justify both of these choices.

Academic language focus in this study. The academic language focus of this study is two-fold: (a) We embraced van Lier and Walqui’s (2012) perspective, grounded in the sociocultural view of language development. That is, academic language veers from decontextualized concepts of language isolated from academic work: It is fostered in the context of engagement in disciplinary activity, and support for that development must occur in the context of that activity (Bunch et al., 2013). In other words, academic language is not a “product” that students must have in order to engage in disciplinary tasks, but rather is an acquisition “process” that is developed through meaningful interaction and collaboration; thus it is important to shape opportunities for academic language development.

(b) This study also draws on the *sociolinguistic* component of Scarcella’s (2003) framework for academic language and focused on the language functions and structures

relevant to expressing one's reasoning and communicating with others in academic discussion settings. Scarcella argued that language functions are critical features of the sociolinguistic component and exist in both oral and written communication. Although language functions can include everyday functions, such as apologizing and complaining, they also include academic functions (e.g., claiming, clarifying, building on the ideas of others, persuading, justifying, giving examples, hypothesizing, etc.). Fathman, Quinn, and Kessler (1992) defined language functions as "specific uses of language for accomplishing certain purposes" (p. 12). In other words, the function of language is dependent on its purpose in a given lesson. In the present study, we explicitly taught and scaffolded—through multiple iterations—the language structures needed to engage in collaborative, reasoning-focused discourse in tandem with the implementation of "Academically Productive Talk" strategies.

Carrier (2005) defined sentence frames as "ready-made chunks of language that help language learners develop fluency and communicate concepts without getting over-involved in grammar rules" (p. 7). Wood (2002) explained how sentence frames can be more easily stored and recalled as a whole multiword unit rather than as individual words. Zwiers (2008) referred to sentence frames as "academic expressions": "the set of words, grammar, and organizational strategies used to describe complex ideas, higher-order thinking processes, and abstract concepts" that can help students clarify what they are trying to say (p. 20). Zwiers provided examples such as "I feel that . . ." or "evidence includes . . ." or "The author used that analogy because . . ." (p. 117).

Explicitly instructing ELs in how to use both sentence stems and frames can be

useful for several reasons. First, linguistic markers can serve as scaffolds and may help ELs express their understanding about the content they are learning without stalling to find the proper word choices and grammatical structures to frame their ideas. Wood (2002) has explained how storing and retrieving multiword units in long-term memory reduces the cognitive load during initial language processing and supports the speaker in focusing on learning content.

The second reason why the explicit instruction of sentence frames and stems is useful is because students benefit from learning specific language functions to communicate their understanding. The Sheltered Instruction Observation Protocol (SIOP) model is a research-based and validated protocol that features the integration of both language and content objectives in order to make content accessible to ELs (Echevarria et al., 2017). Part of the protocol involves determining which language functions learners need to communicate their understanding. For example, if a task requires students to compare, to sequence, or to persuade, then the language functions can be developed to support the purpose and objectives of the lesson. With reference to sentence frames, much of the literature (Carrier, 2005; Tretter et al., 2014; Zwiers, 2008) has centered on considering the overall core concept of a lesson and the learning objectives to determine which language functions to include in the lesson.

Finally, in diverse learning contexts, it is important to recognize that *both* ELs and non-ELs are non-native speakers of academic language (Fillmore, 2014; Zwiers, 2008). Thus, *all* learners benefit from instruction that supports students' linguistic expression of complex thinking and reasoning with others. Moreover, incorporating sentence frames

may help foster students' sociolinguistic competence as students gain practice in using the appropriate school-talk register in authentic academic discourse contexts (Gibbons, 1998; Scarcella, 2003).

Therefore, part of the design for this study was based on the research summarized above and included the explicit teaching of the particular language structures (i.e., the words and sentence stems students need to communicate and reason in discussion) relevant to the four APT goals laid out by Michaels and O'Connor. For example, if the language function is to share one's opinion, the language structure uses the sentence starters *I think*, *in my opinion*, and *from my perspective*. If the language function is to think with others, the language structure uses the sentence starters *in addition to what X said* and *building on what X said*. See Appendix D (Student Cheat Sheet: Academic Language Functions) for a complete list of the academic language structures.

Although this literature and the conclusions of prior research justified our reasoning for providing students with the functional language necessary to engage effectively in APT, relatively little research has been done to test if and how this approach is actually effective. This DBR study is designed in part to fill that gap.

Design Choice 3: Extending Discussion Across Multiple Texts

The next two design choices are included to provide an overview of the codesigning and thinking that gave impetus to the project. They are important to fully understanding the educational context but were not analyzed in this dissertation.

Based on the principle that discussions of a topic can be deepened across multiple texts over an extended period (Parra et al., 2016), the selection of appropriate, grade-

level, complex texts coupled with question development are key elements that lend themselves to “productive” discussions. Although one juicy text may be plenty to spur on a productive discussion, “discussions can be extended across multiple texts or text sets, or a single big question can even be used to drive an entire unit” (Parra et al., 2016, p. 128).

Bruner’s concept of the spiral curriculum (1978) supports this notion of discussions extended across “multiple texts” or a “single big question.” The spiral curriculum can be defined as a course of study in which students examine the same topics over a period of time, but with each encounter increasing in complexity and reinforcing previous learning. Bruner believed that the curriculum was important for “shaping learning” and should be organized in a spiral manner (increasing in depth and complexity), so that the student continually builds upon the concepts they have already learned.

Key features of the spiral curriculum include the student revisiting a topic, theme, or subject over a period of time; the complexity of the topic or theme increasing each time it is revisited; and new learning having a relationship with old learning and being placed in context with the old information. Advocates of the spiral curriculum argue that the benefits include having the information reinforced and solidified each time the student revisits the subject matter, allowing a logical progression from simplistic ideas to more complex ones, and students applying early knowledge, learning, and thinking processes to later ones.

Moreover, Bruner (1990) emphasized the role of discourse as key to helping

students “revise” their beliefs through the ongoing unfolding of the spiral curriculum. Bruner explained that the role of the instructor is to encourage students to “discover” principles as students engage in dialogue with the teacher and other children, in order to explicate and revise their beliefs through discourse. Likewise, Scardemalia (2002) argues that knowledge building can be considered as *deep constructivism* that involves making a collective inquiry into a specific topic, and coming to a deeper understanding through interactive questioning, dialogue, and continuing improvement of ideas. Parra et al. (2016) explain that while one juicy text may be plenty to spur on a productive discussion, “discussions can be extended across multiple texts or text sets, or a single big question can even be used to drive an entire unit” (Parra et al., p. 128). We set out to extend the discussion of what it means to be a “good citizen” by revisiting and drawing links to the overarching theme on a weekly basis with a group of culturally and linguistically diverse fifth graders.

Before beginning this DBR study, the teachers had already begun exploring the topic of “Citizenship: Rights, Rules, and Responsibilities” with their students as one of the curricular goals of the district. Then, as part of codesign, we set out to develop students’ understanding of what it means to be a citizen by revisiting the theme of citizenship in weekly discussions over the course of the investigation. The teachers selected textual materials that were linked to the theme of citizenship in distinct, yet related ways, and students were encouraged to draw connections among the texts and to the main theme.

Thus, over the course of the DBR study, the following question also guided the

codesign: How do students' ideas about citizenship evolve over the course of the codesigned intervention? Discussion transcripts and writing samples from throughout the study were collected to identify any shifts in students' thinking about citizenship. Although this particular piece was part of the initial impetus of the design and was important to the codesigners, I will not focus on this design choice in my analysis of the study.

Design Choice 4: Implementing Self- and Peer Assessment

The next design choice that is important to understanding the educational context but was not studied in this dissertation is the implementation of self- and peer assessment.

Andrade and Du (2007) defined self-assessment as:

a process of formative assessment during which students reflect on and evaluate the quality of their work and their learning, judge the degree to which they reflect explicitly stated goals or criteria, identify strengths or weakness in their work, and revise accordingly. (p. 160)

Boud (1995) asserted that self-evaluation encourages reflection on one's own learning and promotes responsibility, independence, and student ownership of the learning. Peer assessment involves students providing feedback to other students on the quality of their work. Falchikov (2007) argued that peer feedback can encourage collaborative learning through interchange about what constitutes good work.

In this study, we conjectured that another important principle of supporting productive discourse is to encourage through self- and peer assessment. Self-evaluations, self-assessments, and similar exercises can serve as metacognitive tools that potentially give students an increased awareness of how to participate effectively in critical academic conversations. Productive discussions do not just happen: They require disciplined

moves, language to support those moves, and student awareness of the range of types of contributions.

Over the course of this study, students engaged in some self-assessment in order to gain awareness of how they too hold responsibility for shaping productive discourse. For example, students were asked to assess the types of contribution they (or their peers) used most often, and their personal goals for future discussions. Thus, another line of inquiry that guided the study was: How, if at all, does student engagement in self- and peer assessment support shifts in student participation in whole class discussion while also encouraging student to take responsibility for the quality of their participation in discussions?

Summary

These proposed design features were shaped by the theory and prior research examined in this literature review. We conjectured that these design features would work together to establish a learning environment in which participation, reasoning, and collaborative talk are fostered in multiple ways. First, it is important to acknowledge why talk matters and to recognize the kinds of discourse patterns that support students' participation in individual and collaborative reasoning in whole class discussion settings. Second, it is critical to implement the instructional talk moves that can facilitate student engagement in heightened reasoning and in dialogic discourse. Third, it is important to scaffold academic language and provide ELs and non-ELs with the opportunity to practice using those language functions and structures in authentic discussion contexts. Next, we think it is important to implement self- and peer assessment in order to promote

learner responsibility for the quality of a discussion. Finally, we conjectured that deeper understanding and reasoning is built across multiple texts and discussions as students revisit one theme from a variety of angles and perspectives.

Additionally, in this chapter, I also explained my rationale for selecting the DBR approach with particular attention to the importance of bridging the research-practice divide, I explored the central features of DBR that supported this dissertation study, and I used the literature to elucidate the four-phase DBR approach used in this study. In the next chapter, I describe the context of this study in greater detail, and I explain the methodology used for approaching the research questions and for analyzing the data.

CHAPTER 3:

METHODS

In this DBR study, we set out to identify the challenges associated with conducting whole class, text-based collaborative discussions in a culturally and linguistically diverse mainstream fifth-grade classroom; codesign a learning environment informed by preexisting design principles and research-based practices; and identify and account for shifts in whole class discourse and in individual student talk over the course of the codesigned intervention. In this chapter, I present the research questions and review the DBR phases that guided this study. Next, I describe the context of the study, including information about the school, the instructional context, and my partnership with the teachers at the school. Finally, I explain the methods I used to address each question, describing the data sources, the combined qualitative and quantitative methods for analyzing the data, and the analytical tools used.

Research Questions and Procedures

This study was carried out during regular class time in the participants' weekly Discussion Fridays class, which comprised of both ELs and non-ELs and which met every Friday afternoon for one 50-minute period each week. Data collection for the study began in December 2016 and ended in June 2017. Data sources included audio recordings of weekly whole class discussions, field notes from class observations, and notes from monthly meetings (Design Team meetings) with the teachers/codesigners.

This DBR study was divided into four phases (Reeves, 2006), described below.

Phase 1: Needs Assessment

In the first phase of the study, we worked collaboratively to conduct a Needs Assessment and identify the challenges of engaging diverse learners in whole class discussions in their Discussion Fridays class. In addition to identifying the challenges experienced in this particular classroom, we also discussed other common challenges that students encounter when attempting to participate effectively in text-based, collaborative whole class discussion, informed by our past teaching experiences. In Phase 1, we also surveyed relevant literature to begin the process of developing a principled, research-based solution (Bannan-Ritland, 2003).

The following question guided the preliminary Needs Assessment (Phase 1) and the codesigning processes (Phase 2) of the study:

Q1. What are the challenges associated with engaging culturally and linguistically diverse learners in whole class, collaborative academic discussions (as described in the Common Core anchor standards CCSS.ELA-Literacy.SL.5.1) in this “mainstream” classroom at the fifth-grade level?

Phase 2: Development of Solutions

Based on initial analysis in answer to this question, we codesigned a contextually sensitive, theoretically based, research-informed instructional design solution aimed at addressing students’ needs (Barab & Squire, 2004; Cobb et al., 2003). We conceptualized a plan to implement the instructional scaffolding strategies aimed at addressing the common issues identified in Phase 1.

Phase 3: Implementation and Reflection

In the third phase of the study, we implemented a series of instructional adaptations aimed at addressing the challenges identified in Phase 1. During this phase, we collected data to answer Q2 and Q3. After each lesson, we followed a “structured debriefing” sequence (Gibbs, 1988), consisting of design, teach/implement, and debrief in order to recollect, review, and analyze events that took place in the classroom. It was through this regular and repetitive “structured debriefing” process that we could reflect on if and how the intervention was addressing the goals and modify the implementation of the design accordingly.

The following set of questions guided Phases 3 and 4:

Q2. In conditions where teachers systematically implement (a) “Academically Productive Talk Moves” and (b) the explicit instruction of academic language functions (e.g., language used by students to tell, restate, build on, or challenge) to scaffold student communication and reasoning in discussion, how do the discourse patterns of the whole class change? How, if at all, does the talk of students shift over time, with particular attention to (a) participation, (b) reasoning, (c) engagement in collaborative talk, and (d) use of language functions?

Q3. How, if at all, does the individual talk of English learners shift over the course of the intervention with particular attention to (a) participation, (b) reasoning, (c) collaborative talk, and (d) use of language functions?

Phase 4: Data Analysis and Generation of Design Principles

The purpose of the final phase was to conduct a retrospective analysis of the data using quantitative and qualitative approach. First, using quantitative and qualitative methods to assess the baseline transcripts, I substantiated the students' needs that had been identified in Phase 1. Then, I assessed the remaining data to conclude whether and how the codesigned intervention effectively addressed those needs over the course of the study. The final goal in Phase 4 was to generate generalizable design principles based on the findings, principles that can be adapted and used in similar classroom contexts.

It is important to note that the overall codesign comprised several other lines of inquiry that are important to understanding the full scope of the DBR project and the instructional context of the study, which extended beyond the scope of the analysis for this dissertation.² Below, I describe only the analyses that I conducted for this dissertation.

Context of the Study

This section outlines the context of the study, namely the school, the instructional context, the background of the researcher–practitioner partnership, and the roles of each in the study.

² For example, part of the research design involved implementing opinion-writing tasks to investigate the influence of discussion on students' opinion writing development. Another part of the codesign involved employing a "spiral curriculum" (Bruner, 1960) to help students explore the theme, "Citizenship: Right, Rules, and Responsibilities," which was especially important to the teachers as it addressed one of the school district's goals (to foster an understanding of global citizenship).

The School

This study was situated at a Level 2 public elementary school in a semi-urban district in Massachusetts. Level 2 means that the school does not meet all of the performance targets based on the Performance and Progress Index (PPI) to reduce the proficiency gaps, but is not performing at the bottom 20% of schools. The school's percentile, indicating how a school is performing overall compared to other schools with a similar grade range, was at approximately 40%. This indicates that student scoring in Massachusetts Comprehensive Assessment System (MCAS) performance categories falls below the state average at this school. The school served a multilingual, multiethnic population of approximately 700 students in grades PK–5. At the time of this study, the Massachusetts Department of Elementary and Secondary Education (MADESE) classified about 30% of the study body as First Language Not English, approximately 15% as English Language Learner, around 25% as Economically Disadvantaged, close to 45% as High Needs, and nearly 20% as Students with Disabilities (MADESE, 2019). The ethnic demographics of the school were similar to those of the typical school in Massachusetts: about 65% White, nearly 15% Hispanic, approximately 12% Asian, approximately 3% Black, close to 5% Biracial, and approximately 1% American Indian (MADESE, 2019).

The Instructional Context

This study was conducted in consultation with teachers at the elementary school: Mr. M, the ESL teacher with more than 20 years of teaching experience at the school, and Ms. P, the fifth-grade general education teacher with more than 25 years of teaching

experience at the school. One year prior to this study, Mr. M and Ms. P had developed a class, titled Discussion Fridays. The teachers designated one 50-minute period per week to co-teach a discussion class, in which Mr. M would “push in” to provide regular support to the ELs in Ms. P’s mainstream classroom. The teachers employed a variety of strategies, scaffolds, and approaches (e.g., think-pair-share; debate; small group work; whole class discussion, Fishbowl discussion, etc.) for engaging students with diverse needs in discussion. In this course, the teachers strived to improve the capabilities of all students of various language and learning backgrounds, including ELs and students on IEPs, to access grade-level content and to develop academic language skills through academic discussion of multimodal texts.

In the ESL push-in/pull-out program model, which was the model in use at this elementary school, ESL specialists typically “push in” to the classroom for a portion of the day and provide support to their ELs within the context of the mainstream classroom. The focus of this model is on ensuring that students receive full access to the general education curriculum while limiting any disruption to their daily schedule (such as pulling students out of the classroom), and the model includes implementing specially designed classroom modifications (i.e., the provision of scaffolded materials tailored to the needs of the ELs, student seating arrangements). Ideally, in this model, the general education teacher and the ESL specialist work in close collaboration to design and differentiate instruction based on their shared expertise to meet the varied needs of diverse learners.

Mr. M and Ms. P had established a balanced and cooperative co-teaching

relationship with clarity of roles (Arguelles et al., 2000). They shared the responsibility for planning lessons to provide thoughtfully scaffolded, differentiated instruction to the ELs and non-ELs (while still maintaining the same learning goals for all students) in a manner not always possible for one teacher. For example, Mr. M provided expertise in the area of academic language development, which benefited all learners, ELs and non-ELs alike, while Ms. P provided insights into the kinds of challenges students encountered in accessing the grade-level content in their daily classwork. Given the diversity and needs of students in the class, Mr. M and Ms. P pooled together their knowledge of the specific needs of the students and their teaching approaches to maximize the positive impact of students having more than one teacher in the same classroom.

In the particular classroom that I worked in, the implementation of this model differed from standard practice in several other ways as well. In contrast, in the standard approach, ELs are often separated from the large group during servicing hours because specialists believe it is more beneficial to form small groups and provide individualized instruction to “their” students in a quiet section of the room. Mr. M and Ms. P, however, co-taught a class in which ELs were not isolated from mainstream students. Instead, the students and co-teachers worked together within heterogeneous groupings during class time. Likewise, students with IEPs were not isolated from mainstream students in the classroom; rather, the IEP staff supported the students with IEPs by sitting with them both in their smaller heterogeneous groupings or pairs and in whole class learning contexts as they follow the lessons of the day.

Building Alliances: History of the Design-Based Research Triad

The beginning of the partnership. In the early stages of my doctoral journey, I became particularly interested in learning more about how the CCSS's call for a focus on discussion-based teaching/learning approaches is playing out in public schools where ELs are being educated in mainstream classrooms alongside native speakers of English. To find out more about the specific challenges associated with diverse learners in K–12 discussion settings, I contacted a former colleague, Mr. M, who had extensive experience teaching fifth-grade ELs in an English-only instructional setting, and whom I knew to be an excellent educator. Moreover, having been colleagues at a university ESL program that used a theme-driven, content-focused, discussion-based pedagogical approach to teaching English for academic purposes, I was aware that Mr. M and I already shared an understanding of some of the challenges and learning opportunities associated with facilitating discussion with linguistically diverse learners— and that this line of inquiry might be one that was interesting to both of us.

In March 2016, I met with Mr. M and shared my interest in conducting a DBR study on discussion-based teaching. I explained that I was particularly interested in the specific challenges of carrying out whole class discussions with ELs and the instructional scaffolding strategies (e.g., instructional talk moves, the explicit teaching of academic language functions to support reasoned dialogue, etc.) that would help students of various learning and language backgrounds in public school settings achieve the skills required by the CCSS. Further, I explained that I was also interested in understanding to what extent, if any, whole class discussion influences the development of students' individual

opinion writing. Incidentally, Mr. M explained how he and a general education teacher (Ms. P) had developed a discussion class, titled Discussion Fridays, designed to support diverse learners' access to grade-level content through discussion-based learning approaches. We continued to exchange our thoughts on the importance of and the many challenges associated with implementing discussion-based approaches to help students realize the standards envisioned in the CCSS, especially in today's rapidly diversifying mainstream classrooms. It was at that time that we began to consider forming a teacher-researcher partnership for a DBR study in Mr. M's and Ms. P's "mainstream" fifth-grade Discussion Fridays class.

In May 2016, I was invited to observe one of the Discussion Fridays classes. After the observation, I met with both the general education teacher, Ms. P, and the ESL teacher, Mr. M, to discuss again the prospect of developing the project as a *triad* and to discuss the DBR study's overarching research questions, the methodological approach, and the proposed timeframes and phases. At that time, Ms. P also expressed interest in participating in the project. As the general education teacher, she spent a large portion of the day with the students, and she expressed that she had encountered challenges in getting the diverse groups of learners to access grade-level content (i.e., science talk) through meaningful discussion. As a team, we decided that it would be a useful undertaking to explore these challenges to better understand if and how various instructional scaffolding strategies support productive discussion among diverse learners. During the summer, we exchanged preliminary ideas on instructional scaffolds that we could incorporate in the coming academic year with the new group of fifth-grade learners

in the Discussion Fridays class.

In sum, both teachers emerged as eager participants in this study, as the study itself naturally aligned with the overall purpose of their Discussion Fridays class. The teachers—well aware of the challenges and learning opportunities associated with facilitating productive, whole-class discussions in today’s diversifying classrooms—asserted that their practice naturally comprised a daily discovery process of trying out and assessing “what works” in the classroom (Stanovich & Stanovich, 2003). It followed, then, that both teachers were interested in engaging in a systematic method of research that entailed drawing connections to existing theory and developing empirically-based claims regarding the instructional scaffolds that promote effective collaborative, whole class discussion in mainstream settings with ELs and non-ELs.

The merging of the DBR and Team Action. In November 2016, I met with the principal and the two teachers to discuss the project and to ask permission to conduct the DBR study in Mr. M’s and Ms. P’s co-taught Discussion Fridays class. I explained to the principal that two distinguishing features of DBR include research being grounded in real-world settings and working closely with practitioners in those settings. Fortunately, the principal was interested in both the study’s focus on discussion-based teaching for the purpose of propelling students’ (both EL and non-EL alike) participation and oral reasoning processes in their content classrooms and in the collaboration among researchers–practitioners to propel research-based practices at the local elementary school.

At that meeting, I also learned that the school was engaged in a district-wide,

staff-driven, professional project based on DuFour et al.'s (2006) professional learning community (PLC) model for transforming schools into results-oriented professional learning communities. As described in further detail in Chapter 2, the PLC model is an action-oriented improvement plan, in which teachers are required to collaborate with a colleague/s and engage in collective inquiry, dialogue, and experimentation in order to deepen knowledge and improve teaching practices. After I described the nature of DBR study, the principal expressed that the DBR approach was very much in line with Team Action's (the pseudonym I have assigned to the school's district improvement plan) goals. Thus, the study's relevance to the district improvement plan, along with the teachers' interest in the project, was enough to convince the principal to permit the DBR collaboration.

Before beginning the DBR investigation, I was invited to attend a staff meeting at the elementary school, where I gained a deeper understanding of how Team Action was based on DuFour et al.'s (2006) professional learning community (PLC) model for transforming schools into results-oriented professional learning communities.

In sum, Team Action, along with the particular district's goals, helped to shape the contextual backdrop of this DBR study, and the DBR was both relevant and complementary to the district's focus on fostering a "professional learning community."

Teacher–practitioner roles. Before beginning the investigation, as a team, we agreed on a general framework for daily instruction, which also included the proposed design elements, and each lesson would follow the same general organization to maintain a consistent class structure over the course of the study (see Table 2). In addition, we

agreed to draw texts from the Strategic Education Research Partnership's (SERP; n.d.) original Word Generation Curriculum for some of the Friday discussions in the early, middle, and late parts of the investigation to control for the variable of the level of difficulty of the texts used throughout the investigation.

Mr. M and Ms. P maintained their regular roles as co-teachers, engaged in the weekly text selection and co-planning of structured lesson plans at the micro level, and they shaped the curricular goals of their Discussion Fridays class ("Citizenship: Rights, Rules, and Responsibilities") to meet the district's goals, and together we planned how and when we would implement the particular codesign elements (and their iterations) under study. We shared literature that formed the theoretical and research-based backdrop of the study. Literature included work by the following scholars: "Shifting Participant Frameworks: Orchestrating Thinking Practices in Group Discussions" (O'Connor & Michaels, 1996); "Conjecture Mapping: An Approach to Systematic Education Design Research" (Sandoval, 2014); "Talk Science Primer" (Michaels & O'Connor, 2012); "Design-Based Research: An Emerging Paradigm for Educational Inquiry" (Design-Based Research Collective, 2003); and "Instruction for Diverse Groups of English Language Learners" (Walqui and Heritage, 2012).

During class sessions, Mr. M and Ms. P co-taught the first half of each Friday class while I observed and took field notes. I often provided support to the students when they were in pairs or groupings by monitoring as they worked and answering any questions. During the second half of each Friday class, which was allotted to whole class discussion, I participated in the facilitation of the discussions along with the teachers.

We recorded audio from these discussions on a weekly basis, and I then transcribed the discussions.

Design Team meetings. As a three-person team, we met for one hour on the third Wednesday of each month to discuss the project during the designated staff professional development time. We used the time to debrief the weekly Discussion Friday discussions; review transcripts; discuss and reflect on the challenges students face, particularly with regard to achieving the standards required by the CCSS; assess and reflect on the efficacy of the previously implemented strategies; make any necessary modifications to the proposed intervention plan for the upcoming weeks; and exchange and discuss relevant literature as well as research-based teaching strategies.

After all data had been collected, I coded the transcripts, prepared the approaches for conducting the retrospective empirical analysis of Phase 4, and conducted the analysis. As a Design Team, we met again after the results of this retrospective analysis were clear and used the data-based findings to generate design principles and consider the design's applicability to other educational contexts.

Table 2

Discussion Fridays: Framework for Daily Instruction with DBR Design Elements

I.	Introduce a complex text related to the theme, “Citizenship: Rights, Rules, and Responsibilities.” State the overarching content objective for each discussion, which is to build upon and redefine existing notions of “citizenship” in light of each new topic/text (See Appendix L for further details).
II.	Explicitly state the overarching language objective for each discussion as described in the Common Core anchor standards CCSS.ELA-Literacy.SL.5.1 A, B, C, and D (See Appendix L for further details).
III.	Explicitly teach key textual vocabulary via morphological analysis and/or contextualized examples of the key lexical items. (Students are encouraged to use the vocabulary words in focus in the day’s discussion.)
IV.	Pair/small group task: Students engage in tasks that support their understanding/comprehension of the text and simultaneously give students opportunities “time to think” about the content prior to whole class discussion.
V.	Explicitly teach the academic language functions for propelling reasoning and communication in discussions. Implement scaffolds (in various forms) to support students’ use of the language in discussion setting.
VI.	Whole class discussion: Teachers facilitate large group text-based, dialogic discussion, systematically implementing the four APT strategies over the course of the study
VII.	Think & link: In each discussion, students are encouraged to establish links: text-self, text-text, text-world, and text-theme. (e.g., <i>How does today’s talk contribute to our understanding of the theme?</i>)
VIII.	Exit slips or self/group-evaluations: Students assess both their individual and the group’s participation in whole class discussions.
IX.	Bulletin board: Students post ideas from each Friday discussion to the class bulletin board.

Participants

The fifth-grade inclusion class in 2016–2017 was comprised of 18 students: Seven of the students were monolingual English speakers, three of the students were non-EL bilingual speakers, five of the students were current ELs, one student was a former EL, and two students were monolingual English speakers with special needs. Of the 18 students in the class, 15 students agreed to be participants in this study. Four of the students were classified as ELs, whose performance based on Composite Score on WIDA

ACCESS testing was characterized as Level 3 (“developing”) or Level 4 (“expanding”). Language proficiency at Level 3, the “developing” level, is characterized as possessing general and some specific language of the content areas; using expanded sentences in oral interaction or written paragraphs; and producing oral or written language with phonological, syntactic, or semantic errors that may impede communication, but retain much of its meaning. Language proficiency at Level 4, the “expanding” level, is characterized as having specific and some technical language of the content areas, using a variety of sentence lengths of varying linguistic complexity in oral discourse or paragraphs, and making syntactic or semantic errors that do not impede the overall meaning of the communication when presented with oral or written connected discourse. Level 6 indicates a level of proficiency comparable to native English speakers. As shown in Table 3, the EL participants’ composite scores on the Access for ELLs test ranged from 3.6 to 4.4, and the native languages consisted of Farsi, Armenian, Pashto, and Portuguese. The remaining 11 student participants were non-ELs. Two of the 11 students had special needs and were accompanied by an IEP support team member.

Table 3

English Learner Participants

Amin	Farsi	3.8, WIDA ELP Level 3
Sargis	Armenian	3.6, WIDA ELP Level 3
Dario	Portuguese	4.4, WIDA ELP Level 4
Fatima	Pashto	4.1, WIDA ELP Level 4

Design Process and Design Implemented

Next, I describe the process for Phases 1 and 2, which involved visiting the class on four days and collecting data for understanding the challenges and proposing solutions with the teachers. The complete data collection process is further described below.

Then, I show how the major design elements described in Chapter 2 were implemented to address these challenges.

Before codesigning a solution and implementing an intervention, I observed four classes (December 2, 2016; December 16, 2016; January 6, 2017; January 13, 2017) and took field notes comprising descriptive and reflective notes on all days. The whole class discussions on December 16 and January 13 were recorded and transcribed as baseline transcripts. In addition, my collaborators and I met to clarify our roles in the project, exchange relevant literature, debrief the classes that had been observed thus far, and conduct the initial Needs Assessment of the students as evidenced by their participation in the early whole class discussions.

To conduct a Needs Assessment that would inform our design, we began by reviewing the specific benchmarks for participating effectively in high-level discourse as defined in the CCSS, which include (a) engaging effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 5 topics and texts; (b) building on others' ideas and expressing one's own clearly; (c) coming to discussions prepared and having read or studied the required material; (d) explicitly drawing on that preparation and other information known about the topic to explore the ideas under discussion; (e) following agreed-upon rules for discussions and

carrying out assigned roles; (f) posing and responding to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others; and (g) reviewing the key ideas expressed and drawing conclusions in light of the information and knowledge gained from the discussions (CCSS.ELA-LITERACY.SL.5.1. A. B. C. D).

With these standards as the backdrop to our discussion, we pooled our knowledge and teaching experiences to generate an analysis of what we perceived to be commonly encountered obstacles to facilitating productive discourse in classes with diverse learners (Table 4). It is important to note that in part, our interest in the project and the initial Needs Assessment was driven not only by the particular issues in this classroom, but by what we perceived to be common challenges to effective participation in similar classroom contexts across the country. We felt this was important because we wanted to design and implement research-informed interventions that would be adaptable and effective in other similar classroom contexts.

Then, we focused on the specific needs of the particular group of students in this study. We based the initial analysis on the teachers' experiences with this particular group of students since the beginning of the academic year and our post-class debriefings and on-the-spot analysis of whole class discourse and individual students' participation in whole class discussions. For this informal analysis, we debriefed the early discussions while drawing evidence from the class discussions on December 16, January 6, and January 13; field notes; and other artifacts (i.e., student surveys completed before the study) that helped shape our initial understanding of the students' needs.

Table 4 displays an overview of the Needs Assessment generated in Phase 1, after narrowing down the focus of the DBR. (See Appendix H, Preliminary List of Needs Assessment in Collaboration With Teachers, for a more extensive needs assessment generated in collaboration with the teachers, prior to narrowing down the focus of the DBR.) Table 4 illustrates the particular challenges on which I chose to concentrate in this present study. I chose to focus on these challenges because they are significant, first-step components of effective collaborative discussion as described by the Common Core.

Table 4

Needs Assessment for the Whole Class Conducted in Collaboration With Teachers (Phase 1)

Student Participation

- Silence, one-word, phrasal, or simple sentence responses (i.e., “yeah”; “human rights”).
- ELs are generally reticent in discussion in mainstream settings.

Reasoned Talk

- Students restate facts.
- Students do not state their positions or express their views clearly.
- Students do not verbalize their reasoning or justify their thinking with examples and evidence.

Collaborative Talk

- Students speak but do not frame comments in response to previously made comments.
- Students do not appear to listen or respond their peers’ ideas.
- Students do not reason together and build on one another’s comments.

Academic Language

- Students do not use language functions to enter discussions and to frame their comments in response to previously made comments.
 - Students need academic language scaffolds (sentences stems and frames) to facilitate communication and reasoning in collaborative discussions settings (e.g., “I agree with”; “from my perspective”; “in addition to what X said”).
-

Following this process of collaboratively identifying the needs of the students, we then generated a plan to address these needs in Phase 2 (development of solutions). The codesigned intervention examined in this study was comprised of two components, each

informed by existing design principles and research-based practices considered important to the proposed intervention. The codesign involved implementing APT talk strategies to support participation, reasoning, and dialogic discourse and explicitly teaching and scaffolding the academic language for engaging in collaborative discussions.

Design Element One

As described in Chapter 2, a major focus of design was to move beyond IRE interaction patterns that focused teachers' ideas and correct responses to the elicitation and deepening of student reasoning. To do this, we implemented Michaels and O'Connor's (2011, 2012) nine "Academically Productive Talk" (APT) talk moves systematically over the course of the study (see Table 1, Chapter 2, p. 49).

Before each class, we designated who of the triad would be responsible for using specific talk moves. We then implemented the talk moves systematically (beginning with goals 1 and 2 and then adding goal 3 and goal 4) over the course of the investigation (see Table 5 for Codesigned Intervention Summary). We did this to ensure that all of the talk moves were being implemented, that we each had opportunities to practice the various moves, and to ensure that there was a systematic way of tracking and analyzing the shifts in student talk accordingly.

Design Element Two

For this design element, we relied on the sociolinguistic component of Scarcella's (2003) framework for academic language, and we focused on the language functions and structures relevant to expressing one's reasoning and thinking with others in discussion settings. Further, we were interested in understanding if and how the scaffolding and

explicit teaching of language functions (words and sentence stems) facilitated participation, reasoning, and collaborative talk. We also examined to what extent, if any, the explicit teaching of language functions stuck over the course of the study.

The words and sentence stems that were implemented into the lessons complemented the instructional talk moves used by the teachers and included language necessary to perform the following functions: (a) share, expand, clarify (e.g., “From my perspective”; “My point is this”); (b) listen and repeat (e.g., “Put differently, what I hear ___ say is . . .”); (c) give evidence (e.g., “For instance”; “This is evident because . . .”); (d) agree and add on (e.g., “In addition”; “Building on ___’s idea . . .”; “I have a connection to what X said . . .”); (e) disagree and counter (e.g., “On the other hand”; “however”); (f) think and link (e.g., “I’d like to draw a connection to . . .”). Through multiple iterations, the teachers implemented this language in a variety of ways, including offering student-friendly definitions and examples, modeling the use of the functions prior to discussions, providing handheld index cards and academic language cheat sheets for reference by students during discussions, and offering friendly reminders to use the language during discussions. The academic language cheat sheet developed for this project was a tool for students to use which provided sentence starters (linguistic examples) for the various types of contributions students can make in a discussion (see Appendix D, Student Cheat Sheet: Academic Language Functions). These types of contributions corresponded with the APT talk moves.

Other Design Elements

Other design elements included the use of texts from the Strategic Education Research Partnership's (SERP; n.d.) original Word Generation Curriculum for fifth grade for half of the Friday discussions in the early, middle, and late parts of the investigation. Reader's Theater texts present multiple perspectives on a high-interest topic. The texts can be characterized as scripts with various parts divided among readers. Several students would present the text to the class while all students read along with the presenters. Then, all students had the opportunity to reread the text prior to their small group tasks, which also preceded the whole class discussions. See an example of one of these texts in Appendix E, Reader's Theater Sample Text.

To meet the teachers' class objectives (to help students redefine and expand on their existing notions of what citizenship means) and to meet the overarching district's curricular goals ("to promote local and global citizenship"), each text used in Discussion Fridays was related to the theme of "Citizenship: Rights, Rules and Responsibilities" (as expressed by the teachers at the beginning of the study). In each discussion, students were also encouraged to draw connections to previously discussed texts and topics by "thinking and linking" ideas across Friday talks and to post emerging ideas to the class bulletin board.

Another design element involved the use of self-assessments (in the forms of short exit slips and more detailed self-assessments) in order to encourage self-reflection and learner responsibility for the quality of a discussion (see Appendix I, Student Self-Assessment).

Summary

In sum, the intervention designed to address the Needs Assessment comprised the systematic layering in of APT talk strategies and the explicit teaching and scaffolding of the language functions for engaging in collaborative discussions, together with multiple opportunities to practice using them in an authentic setting. Other design elements included the use of texts from the Strategic Education Research Partnership's (SERP; n.d.) original Word Generation Curriculum for fifth grade, revisiting the theme of citizenship in each Friday discussion, and the use of self-assessment to encourage self-reflection.

Table 5

Codesigned Intervention Summary

Date	Text	Implementation of Strategies/Interventions
9/16– 11/16		Discussion Friday was a course in progress: It began in September (2016) at the beginning of the academic school year.
12/2/16		Pre-Design Student Surveys
12/16/16	Reader’s Theater	Baseline Talk Moves not formally implemented.
1/6/17		Teachers introduce the theme of “Citizenship: Rights, Rules, and Responsibilities” to students. Teachers review the purpose of Discussion Fridays—to think critically about the theme of citizenship through weekly discussion topics related to citizenship. Teachers have introduced key academic language for propelling collaborative talk.
1/13/17	Other	Baseline APT Talk Moves not formally implemented.
1/20/17	Other	APT Focus: Expand moves & Listen moves.
1/27/17	Reader’s Theater	APT Focus: Expand moves & Listen moves.
3/10/17	Other	APT Focus: Expand, Listen, Dig Deeper, Think with Others moves. AL: Explicit instruction/scaffolding of language for giving evidence, agreeing, disagreeing (sentence strips on white board).
3/24/17	Reader’s Theater	APT Focus: Expand, Listen, Dig Deeper, Think with Others. AL: Explicit instruction/scaffolding of language for giving evidence, agreeing, disagreeing (handheld index cards plus reminders). Self-Assessment: exit slips for building on each other’s ideas.
4/7/17		Self-Assessment: students conduct self-assessment.
5/5/17	Other	APT Focus: Expand, Listen, Dig Deeper, Think with Others moves. Academic Language: Explicit instruction/scaffolding of academic language (comprehensive cheat sheet provided with all previously taught functions and structures).
5/19/17	Reader’s Theater	APT Focus: Expand, Listen, Dig Deeper, Think with Others moves (cheat sheet provided with all related AL functions and structures).
6/1/17		Self-Assessment: Students conduct final assessment and final post-design survey.

Data Collection

The primary focus of this analysis is to understand shifts in discourse over the course of 7 months (December 2016–May 2017). During this time, 13 discussions were observed and recorded. In each discussion, students engaged in text-talk on a topic related to the theme of “Citizenship: Rights, Rules, and Responsibilities.”

Data Sources

Multiple forms of data were collected and are described below.

Audio-recorded lessons. Each lesson was fully audio recorded from beginning to end. During small group or pair work, I used several handheld recorders to capture some of the work and talk of small group and individual student talk.

Discussion transcripts. For each lesson, an audio recording was made of the whole group discussion, using the omnidirectional mode for recording—which picks up sound equally from all directions. All audio data were then transcribed.

Field notes, including reflections. Field notes from this project consisted of two categories: (a) notes from class observations, and (b) notes from Design Team meetings. The main purpose of these field notes was to inform my interpretation of the discussion transcripts throughout the analytical process.

Class observation notes. I used the audio-recorded (full) lessons to assist me in writing up weekly class observation field notes. These notes were based on my general observations of each class and consisted of both descriptive (a record of events) and reflective (challenges and accomplishments) information. The challenges and accomplishments were centered on the work and talk of the class during whole class

discussions; in addition, I paid particular attention to four focal English learner students whose talk I chose to examine more closely and later compare to the discourse of the whole group. I recorded my observations and thoughts on their participation, both before and during the whole class discussions. Moreover, I noted and reflected on how and when the teachers implemented various threads of the intervention plan.

Design Team meetings. As previously described, the two teachers and I met on the third Wednesday of each month to debrief the classes and to confer on a variety of aspects related to the general planning of Discussion Fridays (e.g., syllabus planning, scheduling) and the DBR process (e.g., Needs Assessment, development of the intervention plan). These meetings began in November 2016 and continued through June 2017. The notes from these meetings serve as a record of how, when, and why instructional adaptations were implemented over the course of the investigation.

Additionally, sometimes planning and discussion about the project extended into our email communications and brief meetings prior to each Discussion Fridays class, during which we would review our plans for implementing new scaffolding strategies and any other instructional adaptations. Notes and records from these communications were also used to inform analysis and interpretation of the raw data found in the discussion transcripts.

Other artifacts. Other forms of data that I referenced (during the memoing process) to better understand the challenges in shifts in the talk of individual focal students included student surveys and student self-assessments. In student surveys, students responded in writing to a survey, once before beginning the study and once at

the end of the study. The purpose of the surveys was to gain an understanding of the learners' beliefs about discussion-based learning and to determine whether and how their beliefs might be contributing to some of the challenges and successes they encountered (see Appendix J, Pre- and Post-Study Survey). With self-assessments, students evaluated various aspects of their participation in class discussions over the course of the study (see Appendix G, Decision Rules: Coding Talk Moves).

Texts Difficulty and Sampling Plan

For this study, we were planning to do an intervention in which students would be engaging in a text-based discussion on a new, relatively short text for each Friday Discussions class. Although this was not a controlled experiment, I were still concerned that text difficulty could potentially influence how easily the text is understood by the fifth-grade students in the classroom, and that could in turn influence students' participation in discussion. I wanted to use texts that provided some level of *consistency* (not necessarily easy) in terms of how easily the texts were understood by the group of 11- and 12-year-old participants in the study. To that end, the teachers and I agreed to draw texts from the Strategic Education Research Partnership's (SERP; n.d.) original Word Generation Curriculum for fifth grade for half of the Friday discussions in the early, middle, and late parts of the investigation. We used four Reader's Theater texts, which based on eight readability formulas have a readability consensus of "fairly easy to read" (readers' age 12 to 14 years old). In general, readability tools use the same core measures (i.e., word length, sentence length) to calculate how difficult a passage in English is to understand. I believed that this approach would help to control for the

variable of the level of difficulty of the texts used throughout the investigation. See an example of one of these texts in Appendix E, Reader's Theater Sample Text.

Additionally, when I was selecting the discourse transcripts for the sampling plan of this study—which comprises eight discussion transcripts— I included transcripts from four text-based discussions using Reader's Theater texts and I included transcripts from four other text-based discussions that did not use Reader's Theater texts. When showing trends in the figures and tables, I alternate between Reader's Theater transcripts and teachers' text selection transcripts as a way to account for and understand how the difficulty of text selections might have influenced the students' participation in discussion. In other words, this design could inform if and how text difficulty might be causing shifts in student discourse.

Analytic Approach

Retrospective data analysis involved a combined qualitative and quantitative approach. The research questions focused on first substantiating the challenges and then on understanding shifts in discussion for the class as a whole and for EL students, as well as understanding if and how the supports put in place supported those shifts. Analytic procedures therefore involved both quantitative analysis to describe change and closer qualitative analysis to understand how change played out and what instructional features supported shifts.

My closest analysis was of eight transcripts. The discussion transcripts were divided into sets (four sets, two discussion transcripts per set) based on which strategies were introduced and implemented, and each set included one discussion of a Reader's

Theater text from the Strategic Education Research Partnership's (SERP; n.d.) original Word Generation Curriculum (for fifth grade) and one discussion of a text that was the teachers' choice and part of the 5th grade curriculum.

My analytic approach made use of a variety of forms of analysis. I relied on low inference proxy measures (e.g., student word count, teacher word count, average words per turn, count of reasoning words, count of students referencing their peers by name or pronoun) to make observations in terms that are as concrete as possible regarding amount of talk by students and teachers, students' verbalization of reasoning, engagement in collaborative talk, and use of language functions. I also coded other important aspects of discourse that can be quantitatively represented (APT talk moves). Then, to make sense of the counts and percentages, I also relied on high inference descriptors and analysis garnered through the qualitative process of memoing. Finally, I also pursued correlational analyses in order to examine the possible relationships between elements of the codesign and shifts in talk. To make use of these different forms of analysis, I took the following steps:

1. Coding the transcripts using tools to code: teachers' facilitation of discussion; students' use of reasoning words; students' dialogic moves; students' use of explicitly taught language functions (see below for further detail).
2. Assessing the data quantitatively and using the quantitative analysis to inform my interpretation in the memoing and vice versa (Speziale & Carpenter, 2007).

3. Using other forms of data to extract further meaning from the coded transcripts and using that information to further develop the memos.
4. Examining the memos over time and generating themes that emerged from the trends and shifts in the memos.
5. Providing tentative explanations.
6. Refining those tentative explanations with each new cycle of analyses.

Analytic Tools and Procedures

In this section, I describe the tools I used to analyze the discussion transcripts, how I applied these tools to transcripts, and how I supplemented them with other data and forms of analysis to answer each of the three research questions. Because I used the same basic process/analysis techniques for all three questions, I will first describe the procedures I used for Q1, and then I will note the ways in which I deviated from these procedures to answer Q2 and Q3 at the end of this section.

Transcripts of whole class discussions were analyzed to investigate teachers' facilitation of, and students' participation during, the discussions. Transcripts were segmented into teacher and student turns as the grain size for analysis. Sets of codes were developed to explore teachers' and students' talk. Finding useful tools to describe changes in classroom talk was essential to my analysis both of initial challenges and of shifts in discourse over the course of the study: I describe these four tools—APT Goals and Moves Tool; Reasoning Words Tool; Collaborative Talk Tool; and Academic Language Tool—in the next section.

Coding instructional talk. The first aspect of discourse I focused on was the teachers' instructional talk. I drew on research from "Accountable Talk" (Michaels et al., 2008; Resnick, Michaels, & O'Connor, 2010) and "Academically Productive Talk" (Chapin et al., 2009) and coded for the nine APT moves. This analysis was important because I wanted to understand whether and how the talk moves supported shifts in students' participation and reasoning, and I needed a tool that would allow me to track the use of talk moves before and after we implemented them. I used the tool in Table 6 to chart the use and frequency of APT moves over the course of the study. The coding of the nine moves was further categorized into different sets of talk moves based on the four APT goals.

Table 6

APT Goals and Moves Tool

CODE	Goals and APT Moves	Description	Example
G1: Expand Moves	Goal: Help students share, expand, or clarify their thinking. APT Moves: Time to think, Say more, So, are you saying	This set of moves prompts individual students to explicate their thinking.	“Okay, can you tell me more?” “What do you mean by that?” “Could you give an example to help us better understand?” “So, are you saying that global warming is a serious threat?”
G2: Listen Moves	Goal: Help students listen to one another. APT Moves: Who can rephrase or repeat?	This set of moves prompts students to listen carefully to their peers’ ideas.	“Okay, can someone paraphrase what Daniel just said?” “Who can tell us, in your own words, what Anna just said?”
G3: Dig Deeper Moves	Goal: Help students deepen their reasoning. APT Moves: Ask for evidence or reasoning.	This set of moves encourages students to provide reasons, justification, or evidence for their own claims.	“But do you think it always works that way?” “What evidence do you have to support that point?” “Why do you say that?”
G4: Think With Others Moves	Goal: Help students think with others’ ideas. APT Moves: Agree/disagree; Add on; Explain what someone else means	This set of moves encourages students to engage with their peers’ ideas for building on and evaluating the collective knowledge of the classroom community.	“Anyone want to add to, agree, or disagree with what Joe just said?” “Does anyone want to explain what Anna means?” “Who has something to build on/add to what Anna just said?”

Adapted from APT Talk Moves, Chapin, O’Connor, & Anderson, 2009.

A supplementary flow chart (see Appendix F, Flow Chart: Coding Talk Moves) was developed to guide the coding process of APT talk moves. Note that the flow chart hierarchically begins with Goal 4 and then continues down to Goal 3, Goal 2, and Goal 1. The flow chart is organized in this way in order to facilitate a clear and systematic coding process. In addition, I developed a list of detailed decision rules (see Appendix G,

Decision Rules: Coding Talk Moves) to accompany the Flow Chart and to establish a reliable system for coding the teacher turns.

Inter-rater reliability. In order to refine and test the validity of the tools used to code the APT moves, it was important to establish inter-rater reliability. To do this, I trained a rater on how to use the coding tools (flow chart and decision rules) using two practice transcripts. Then, we separately coded the teacher talk on four transcripts (50% of the transcripts) following the training period. I determined reliability by percent agreement (Hintze & Matthews, 2004), which involved dividing the number of exact agreements in observation by the total number of observations. I calculated the percent agreement on which teacher turns were coded G1, G2, G3, G4, or No Code. Agreement between raters of 80% and 90% was necessary for establishing reliability (Hartmann, Barrios, & Wood, 2004). I determined that agreement between raters of 85% was necessary for establishing reliability.

Coding student talk. I focused on three features of student discourse as part of the analysis of whole class discourse.

Amount of talk. To establish a proxy measure of student participation over the course of the study, I segmented the transcripts into teacher and student turns. Parsing the transcripts in this manner allowed me to track the number of words uttered by students and teachers in each transcript. Using these counts, I tracked whether the ratio of student talk to teacher talk shifted for the whole class over the course of the study and the average words per turn per student. I wanted to know if and how the proposed intervention supported a shift in students' oral participation. This was important because,

according to World-Class Instructional Design and Assessment (WIDA; 2012) performance definitions, oral discourse levels among K–12 learners range from Level 1 (“bridging”; words, phrases, chunks of language) to Level 6 (“reaching”; multiple complex sentences for organized, cohesive, and coherent expression of ideas). Students are expected to use grade-appropriate language to achieve these oral discourse standards. Moreover, longer instances of student talk often result in opportunities for greater elaboration, reasoning, and high-level thinking (Mercer, 2008; Nystrand, Wu, Gamoran, Zeiser, & Long, 2003). Thus, it was important to track the amount of talk using the above methods and tools.

Reasoning words. Tracking the amount of words used by students and teachers, however, did little to tell me about students’ engagement in the reasoning process. To explore this aspect of student discourse, my procedure involved initial identification of the key reasoning words, commonly used modals, adverbials, conjunctions, and verbs that, when used in an appropriate context, signal reasoning (Boyd & Kong, 2017; Soter et al., 2009; Wegerif & Mercer, 2000; Wegerif, Mercer, & Dawes, 1999). Table 7 shows the reasoning words tracked in this study. Reasoning words were organized according to presumed function: speculating/proposing, positioning claiming, analyzing generalizing (Soter et al., 2009). I identified these reasoning words in the transcripts using the “Find” feature in Word and then reviewed each occurrence of each reasoning word in context to determine if the word was used in service of reasoning. I also identified specific parameters for when not to code these words as reasoning words, as shown in Table 7. For instance, modals used in the deontic or dynamic senses were not identified as

reasoning words. The same modal can have an epistemic (expressing the speaker's opinion about the truth of a proposition or what may be, including likelihood and certainty), deontic (concerned with obligation, permission, offering, requesting, granting, commanding), or dynamic (expressing ability or willingness) meaning. Only the epistemic modals were coded as reasoning words. Moreover, epistemic modals that occurred when students quoted the text directly were not counted because ultimately, I was tracking when students used this type of language to express their *own* reasoning.

I used the tool displayed in Table 7 to code and tally the reasoning words (RW) used by students over the course of the study, which served as low proxy indicators of reasoning (Boyd & Kong, 2017; Soter et al., 2009; Wegerif & Mercer, 2000; Wegerif et al., 1999). Tracking the reasoning words was important because I wanted to understand whether students were verbalizing their own reasoning, rather than just uttering content words, phrases, or information that did not necessitate student thinking and reasoning and whether this changed over the course of the study. Moreover, I wanted to know if higher incidences of reasoning words can be attributed to increased participation in APT after all four goals had been implemented.

Table 7

Reasoning Words Tool

Category and Code	Words	Examples of Coded Words	Examples of Words NOT Coded
Positioning & Claiming (PC)	think thought agree disagree	S: “I <u>think</u> people should be responsible for their behavior.” S: “I <u>agree/disagree</u> with that idea because...”	S: “I can’t <u>think</u> of the word...” (“Think” is not used in the context of claiming or positioning.)
Speculating & Proposing (SP)	could can would should might improve may maybe if	S: “That <u>could</u> happen soon.” S: “That <u>may</u> cause isolation.” S: “That <u>can be</u> a solution.” S: “This situation <u>might</u> improve.” S: “That <u>should</u> be what teachers do.” S: “That <u>wouldn’t</u> solve the problem.” S: “ <u>If</u> people talked to him at lunch, he <u>wouldn’t</u> feel isolated.”	S: “I <u>could</u> ski when I was young” (ability). S: “ <u>May</u> I help you?” (offering). S: “She <u>can</u> speak three languages” (ability). S: “You <u>should</u> stop that now” (commanding). S: “When I was young, we <u>would</u> visit my grandparents every summer” (repetition in the past).
Analyzing & Generalizing (AG)	because/ cause so but	“We should still help <u>because</u> it makes us better people and citizens.” “They can’t speak the language, <u>so</u> then, that would make people feel isolated.” “Yeah, laws are important to have, <u>but</u> laws are not always fair.”	S: “He’s <u>so</u> interesting.” (In this context, ‘so’ is an adverb, similar in meaning to ‘very.’ It does not indicate a reasoning process at work.) S: “I think <u>so</u> .” S: “ <u>So</u> , um, in my opinion...” (In this context, “so” is a filler rather than a word linking a reason to an assertion.) S: “ <u>But</u> can I say something now?” (In this context, there is no obvious contrast to the previous statement.)

(Adapted from Boyd & Kong, 2017; Soter et al., 2009; Wegerif et. al., 1999)

Collaborative talk. The next feature of student discourse that I coded was students’ explicit references (by name or pronoun) to other students’ contributions. This step was important because of our interest in collaborative talk (as described in the Design Process and Design Implemented section, pp. 78–86). I wanted to use a low

inference proxy measure of this type of collaborative talk. To capture collaborative talk and the “building on others’ ideas,” I generated the following coding scheme (see Table 8) as a low inference proxy measure.

Table 8

Collaborative Talk Tool

Code	Description	Examples
Student references a name or pronoun (SRS)	S refers to another S’s contribution and explicitly references the name or pronoun of the student being referenced.	<p>S: “Like what <u>Anna</u> said, it was three times a day. That kind of sounds like, I think people might get the idea that it's an obligation.”</p> <p>S: “Building on/adding to what <u>Anna</u> said, it was three times a day. That kind of sounds like, I think people might get the idea that it's an obligation.”</p> <p>S: “Like what <u>she</u> said, it was three times a day. That kind of sounds like, I think people might get the idea that it's an obligation.”</p> <p>S: “<u>He’s</u> (reference to a peer) saying that everyone should treat others fairly.”</p> <p>S: “<u>Mario</u> means...”</p> <p>S: “I want to branch off from what <u>she</u> said...”</p> <p>S: “I didn’t get/understand/hear what Mario/he/she just said.”</p>

(Adapted from O’Connor et al., 2015)

Academic language functions. The next feature of student discourse that I coded was students’ use of explicitly taught academic language versus nonexplicitly taught academic language functions for communicating and reasoning in discussion contexts. This aspect of my research was important because I wanted to know whether and how the explicit teaching of language functions supported any shifts in student reasoning, engagement in collaborative talk, and use of language. I coded for a specific list of language functions that were explicitly taught to the students as part of the proposed codesign; additionally, I used distinct codes for variations of those language items as

students also developed their own ways of expressing the explicitly taught language functions. Table 9 summarizes the discourse features related to language functions that I coded. I identified all of the specific academic language using “Find” feature in Word and then reviewed each occurrence in context, to determine if each word or phrase was used in service of communicating and thinking with others in whole class discussion.

Table 9

Academic Language Tool

Code	Language Functions	Explicitly Taught Words and Phrases	Nonexplicitly Taught Words and Phrases
AL1	Words and phrases to share, expand, or clarify in a discussion.	<i>AL1-ET</i> From my perspective; in my opinion; as far as I’m concerned; what I’m saying/trying to say is; my point is...	<i>AL1-NT</i> I mean... It seems to me that... I’m trying to clarify...
AL2	Words and phrases for listening and/or repeating.	<i>AL2-ET</i> In other words; put differently; what I hear X saying is; this is how I understood what X said; X’s saying...	<i>AL2-NT</i> Can you repeat what X said? I didn’t (or don’t) hear (know) what X said. I can’t put it in my own words.
AL3	Words to give evidence or reasons and/or to exemplify.	<i>AL3-ET</i> For instance; for example; according to the text/author; this is evident in; according to the author/text...	<i>AL3-NT</i> He/she/it (the text) says... X told us...
AL4	Words and phrases to agree, disagree with, add onto, or explain what others have said.	<i>AL4-ET</i> I agree/disagree with X; building on X’s idea; in addition (to what X said); I’d like to add (on) to what X said; moreover, furthermore, in connection to (what X said); on the contrary; on the other hand; however; I have a different view from X; I see it another way...	<i>AL4-NT</i> Like (what) X said... About to what X said... To what X said... I like X’s idea... I’d like to branch off... He’s trying to say... He/she means... I don’t understand/get was X said/means...

(Language functions categorized according to the four APT strategies, Chapin, O’Connor, & Anderson, 2009)

Analytic Tools and Procedures: Q1

Now, I will discuss how I used the tools and qualitative analysis to answer RQ1, which investigated the challenges associated with engaging diverse students in whole class, collaborative discussion. While we had begun to engage with this question during our design process (as described earlier), I continued here to conduct a more nuanced retrospective analysis to substantiate the challenges we identified in the Needs Assessment.

My formal analysis consisted of retrospectively examining the discussion transcripts from Phase 1 using quantitative and qualitative approaches. This part of the formal analysis helped me ascertain whether and how the particular needs identified during the Needs Assessment phase were actually evidenced in the transcripts, field notes, and other classroom artifacts. In addition, this part of the formal analysis provided a baseline against which to compare any shifts documented in the later data from the study. Next, I explain how I used the coding above, along with the field notes, to engage in the memoing process.

I used the coding above, along with the field notes (class observations and Design Team meetings) from Phase 1 of the study, to inform the qualitative interpretive process of memoing. Then, quite iteratively, the memoing processes informed the quantitative processes and the quantitative results further informed the qualitative processes. Lines of inquiry in the memoing process included:

- What is the ratio of teacher talk to student talk?
- Is the discourse of the whole class more IRE or more dialogic?

- What kinds of instructional talk do the facilitators use?
- Which, if any, APT talk moves are evidenced in the early transcripts?
- How would I characterize the instructional talk in the early transcripts?
- How would I characterize the student talk in the early transcripts?
- Do students express their reasoning?
- What types of reasoning words are evidenced in the transcripts?
- Do students engage with the thinking of their peers? If so, how is this evidenced?
- How does the participation of the ELs compare with the participation of the non-ELs?
- What are the trends in student discourse?
- What are the trends in instructional discourse?
- Do students use, with more frequency, the explicitly taught academic language?
- Do students use other variations of the explicitly taught academic language? If so, what does this suggest?
- What are some of the shifts that I anticipate seeing in the later transcripts?

Then, I identified themes and sub-themes, based on patterns that emerged from the coded data, and proceeded to make claims. I used passages from the transcripts to illustrate and to support the claims. Additionally, I used numerical data from the quantitative results to confirm the patterning in the data. As previously stated, the quantitative results further informed the qualitative processes and vice versa, and this was an iterative process.

Analytic Tools and Procedures: Q2

To answer this question, I repeated the analysis process from Phase 1, but to understand how the talk of the whole class shifted over time, I analyzed the discussion transcripts from January 20, January 27, March 10, March 24, May 5, and May 19. I chose these particular transcripts because I wanted to understand if and how implementing the particular design elements in focus supported shifts in whole class discourse, with particular attention to participation, reasoning, dialogic discourse, and use of academic language. The discussion transcripts were divided into sets based on which strategies were introduced and implemented. Table 5 (Codesigned Intervention Summary) was used to describe when particular strategies were introduced in relation to the days of instruction and to inform the development of a sampling plan that might shed light on changes in discourse in relation to instructional strategies.

I selected discussion transcripts from January 20 and January 27 as a set because the talk moves associated with goals 1 and 2 had been implemented at that stage of the project. In addition, one of the texts used in this set was a Reader's Theater text. (This was the case for each set of two: one of the texts for discussion was a Reader's Theater text and the other was a teacher's choice.) Then, I selected the discussion transcripts from March 10 and March 24 as another set because talk moves associated with goals 3 and 4 had been implemented at that stage of the project.

Finally, I selected transcripts from May 5 and May 19 as a final set because at that stage of the study, all of the APT talk moves (Goals 1, 2, 3, 4) had been implemented.

In addition, the explicit teaching of language functions (using various approaches)

had been repeated over the course of the study (see Table 5, Codesigned Intervention Summary). For example, in one class, the teachers modeled the use of particular language functions and posted sentence strips with linguistic examples on the board. The teachers explained the functions of the language stems and students were explicitly instructed to use them to preface the comments made within the discussion. In another class, teachers gave students handheld index cards (two cards per student) and instructed them to hold the cards and use them as reminders during discussion. In the latter part of the study, academic language cheat sheets had also been implemented (see Appendix D, Student Cheat Sheet: Academic Language Functions).

For each day, I coded the discourse using the tools described above and then developed a memo to extract further meaning from the coded transcripts. I subdivided the memos into the four themes/categories I was examining: (a) participation, (b) reasoning-based talk, (c) collaborative talk, and (d) use of explicitly taught language. I first used the quantitative data to help me describe student discourse, including changes I noticed in each of the four categories. Some questions I asked included: Is student talk increasing or decreasing as different scaffolds are being introduced? Is there evidence that students are building on the ideas of others?

Then I used my field notes to inform this qualitative process. In other words, I used my field notes to supplement information that may not be obvious in the transcripts such as a particular student having a “bad day,” student absences, or any distractions (e.g., fire alarm, the principal’s announcement on the overhead speaker) that may have influenced the discourse on that day. Additionally, in the memos I included any

instructional adaptations that were made since the last transcript was analyzed and provided the rationale for doing so.

After coding the transcripts, I identified themes and sub-themes, based on patterns that emerged from the coded data, and proceeded to make claims. I used passages from the transcripts to illustrate and to support the claims. Additionally, I used numerical data from the quantitative results to confirm the patterning in the data. I went back and examined evidence that linked possible shifts in student discourse or ongoing challenges to design choices. However, I also recognized that it would be difficult to definitively link design choices to shifts in discourse and proceeded cautiously. In other words, sometimes multiple changes took place simultaneously, so it was important to look at the data systematically and to triangulate my analyses with my committee members to maintain objectivity.

Analytic Tools and Procedures: Q3

To answer this question, I focused on four individual EL students to determine whether and how shifts in whole class discourse were playing out in the individual talk of ELs over the course of the study. The EL focal students consisted of two students classified as “developing” and two students classified as “expanding” based on the ACCESS/WIDA levels. Each student had a different language background, as demonstrated in Table 3. Although these ELs’ performance on WIDA/ACCESS testing was characterized as “developing” or “expanding,” which means that they possess intermediate to high-intermediate proficiency in English, two of the students continued to be reticent in discussions in their mainstream academic settings. The more proficient

students were more active participants in class discussions but tended to display limited reasoning skills and engagement in dialogic discourse in discussion settings. That is to say, these students often stated opinions or called out facts, but they did not explicate their reasoning or engage with and build upon their peers' ideas.

For this stage of the analysis, I used the same previously coded transcripts and memos, but concentrated on the codes for these focal students to examine whether and how shifts in whole class discourse applied to the individual talk ELs. I specifically examined whether and how there were shifts in their participation, reasoning, and engagement in dialogic discourse, as well as their use (if any) of explicitly taught academic language.

For each EL, I developed individual memos to elaborate on the themes identified in the coding process and to make claims about the student. To compare across the codes over time, I looked for instances when students demonstrated shifts in discourse that were specific to their challenges. For instance, if a student mostly expressed individual reasoning in earlier transcripts but did not engage in reasoning with others, I looked to see if there were any shifts in his/her engagement in thinking with others. I used my field notes (class observations and Design Team meetings) and other classroom artifacts (student surveys, self-assessments, and exit slips) to inform this qualitative process. I also used my field notes to supplement information that may not have been obvious in the transcripts, as before.

After coding the transcripts, I went back and examined evidence that linked possible shifts in student discourse to design choices. For example, I might have found

that a focal student responded well to a particular talk move or a language scaffold. If it was unclear which aspect of the codesigned instruction the shift could be attributed to, I noted this in the memos and tried to use other data (e.g., field notes) to inform my understanding. I developed a separate memo for each student for each day of instruction.

The process involved:

1. focusing on the student's discourse in the transcripts;
2. describing and interpreting the codes in the individual memos;
3. using other forms of data (e.g., whole class discourse memos, field notes) to extract further meaning from the coded transcripts and record these reflections in the individual memos;
4. examining the memos over time and generating themes that emerged from trends and shifts;
5. providing tentative explanations; and
6. refining those tentative explanations with each new cycle of iteration and analysis.

Finally, I extended the analyses to see if and how the shifts in the focal EL students' discourse compared with the trends and shifts in the whole class discourse and used these analyses to refine my explanations. For each claim, I looked across the data and examined if the claim worked in the same way for the EL students as it had for the whole group. I looked for both confirming and disconfirming evidence. If there was a difference, I refined the claim to reflect that difference.

CHAPTER 4:

PHASE 4: SUBSTANTIATING THE NEEDS ASSESSMENT

In this section, I describe the results of the analysis used to understand the way that students were engaging in classroom discussion prior to our systematic implementation of the codesign. Doing so allows me to substantiate whether the needs I identified with teacher colleagues were supported in the data and to provide a baseline description to compare shifts in discussion to Chapter 5. I begin with a general analysis of the whole class discourse in Chapters 4 and 5. Later, in Chapter 6, I will be looking more specifically at how the findings in Chapters 4 and 5 play out for the English learner students.

After reviewing the CCSSs in Listening and Speaking for the fifth grade, the codesigners and I envisioned a teacher-facilitated, yet student-centered, discussion setting in which students grapple with complex texts and reason aloud about the topics they are learning. We imagined students engaging in the giving and taking of information with one another through active turn-taking. Students would explore their agreements and disagreements respectfully by sharing their perspectives, justifying their thinking, drawing connections to their personal lives and the world outside, listening to one another, and building on previous comments through multiple exchanges. As described in Chapter 3, as part of the larger DBR study, we sought to address the particular set of challenges presented in Table 4 by implementing APT talk moves and by explicitly teaching academic language for communication and reasoning in discussion settings.

The structure of this chapter is as follows. First, I substantiate the challenges in the Needs Assessment from Phase 1 with evidence drawn from the early baseline transcripts and other data sources (e.g., field notes, memos) via quantitative and qualitative analyses. I rely on numerical data to characterize the participation patterns that existed before we systematically implemented the codesign. I then conduct an analysis of the early transcripts to explain the participation patterns in greater depth.

Substantiating the Challenges Using Quantitative Data

To substantiate the challenges, I focus on both teacher talk and student talk in order to begin identifying recurring patterns and relationships among the two. To ascertain whether the data supported our initial Needs Assessment, I used a series of low inference data measures to understand the talk with regard to the following five aspects. (These measures were previously introduced in the Methods section.) The following outline lists the multiple level analysis used in this study:

1. Teacher Talk: I examined the nature and extent of teachers' use of APT moves to support students' learning.
2. Student Participation: I examined the ratio of student talk to teacher talk, the percentage of students participating, and the number of turns and average words per turn in student and teacher talk.
2. Student Reasoning: I examined the frequency of reasoning words (claiming and positioning, speculating and proposing, and analyzing and generalizing).
3. Students' Collaborative Talk: I examined collaborative talk, as measured by students' referring to one another by name or pronoun.

4. Students' Academic Language: I examined students' use of explicitly taught academic language for discussion (e.g., "in my opinion, "in addition to what X said . . .") over the course of the study.

Assessing the Use of APT Moves in the Baseline Transcripts

Although we had intentionally not begun to systematically implement the scaffolds under investigation in the baseline transcripts, it was difficult to completely control for all conditions. For one thing, instruction occurred in a real-world setting in which teachers were continually attending to and addressing the authentic academic needs of students through their regular classroom practices. Additionally, the class had already been in progress for several months prior to this study, and teachers had already been using some of the talk moves (that came naturally to them) in their existing practice. They had also begun drawing students' attention to words and phrases useful for communicating in discussion settings. Thus, given this backdrop, it was necessary to understand the purposes for and to track the extent of which these particular scaffolds (teachers' use of APT talk and the scaffolding of language functions) were present in the classroom practices during the early "baseline" discussions, and I do this in the subsequent paragraphs.

It is important to disclose that although I refer to the instructional discourse as "teacher talk" in my analyses of the data, this "teacher talk" comprised the talk of the general education teacher, the ESL teacher, and support staff for students on IEPs. In addition, I also participated in the facilitation of discussions throughout the investigation. That is to say, I treated the "teacher talk" as if produced by one person when conducting

the analysis.

Figure 2 displays the frequency of four types of APT moves by date, normalized transcript time to 15 minutes to ease comparison on December 16 and January 13 (before the intervention). As shown in Figure 2, teachers most often used Dig Deeper talk moves, that is, instructional talk moves that help individuals provide evidence or reasoning for their thinking. To a much lesser extent, teachers also used Think with Others talk moves, moves that encourage students to think with and build on their peers' ideas.

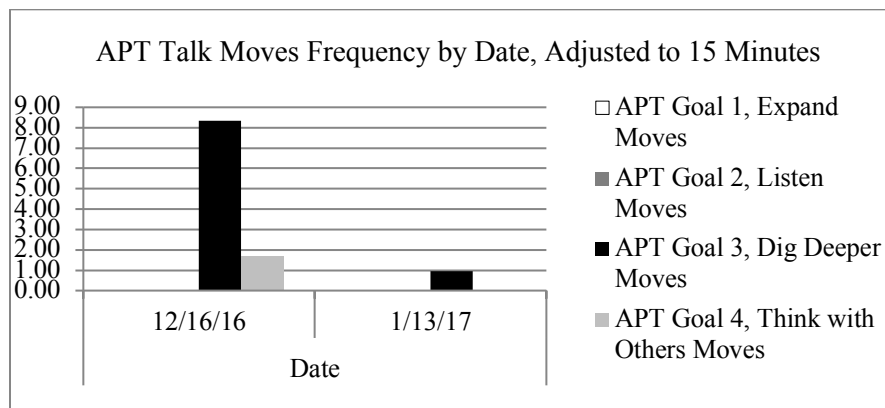


Figure 2. Teachers' use of APT moves before intervention.

Student Participation (Amount of Talk)

Ratio of student to teacher talk. In the early classes, teachers talked more than students. Figure 3 demonstrates that teacher word count was significantly higher than student word count per 15-minute time period: The word count of teacher talk was almost double that of student talk on both December 16 and January 13.

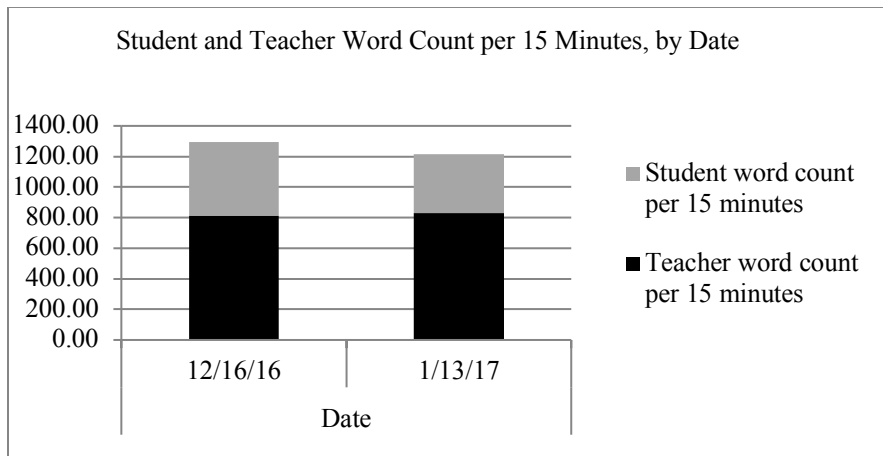


Figure 3. Student and teacher word count per 15 minutes in baseline transcripts.

Percentage of students participating. I wanted to understand more about how *many* students were participating because these were “collaborative” discussions, which entail students listening to one another, sharing diverse perspectives, and building on each other’s ideas. Thus, it was important that more than just one or two students were participating in the discussion. I calculated the percentage of students participating over the course of the study, accounting and adjusting for any absences on each day. As shown in Table 10, student participation in the baseline transcripts was 53% on December 16 and 86.66% on January 13. Although approximately only one-half of the students participated in the first class, the second class had the second highest level of

participation over the course of the study (as evidenced in comparison to later data presented in Chapter 5).

Table 10

Percentage Participation in Baseline Transcripts

Class Date	Percent Participation
December 16, 2016	53.33 %
January 13, 2017	86.66 %

A higher percentage of students participated in the January 13 transcript, yet the ratio of student talk to teacher talk stayed about the same. In fact, there was a slight decrease in overall student talk (12%) in the second transcript, although there was a higher percentage of students participating, indicating that in terms of total words, teacher talk was approximately twice as many words as student talk. The data show that students were participating less than teachers, regardless of the percentage of participating students. In other words, the issue of low student participation (low student total word count) was not a simple matter of the number of participating students. Even when close to 90% of the students participated, the total talk that students contributed was still low in comparison to teachers' talk.

Average words per turn. To gain a deeper understanding of how student talk and teacher talk were playing out in the early transcripts, I also calculated the number of turns taken by teachers and students and the average words per turn. Table 11 shows that although there was an equal number of teacher turns and student turns per discussion,

student turns were generally shorter than teacher turns in these early transcripts. This demonstrates that equal number of turns do not necessarily equate to equal amount of talk; that is, students often still uttered short contributions in comparison to the teachers, as displayed in the transcripts (see Example 1). Although teachers and students took an equal (or almost equal) number of turns, teacher turns were almost twice as long as student turns in the early transcripts.

Table 11

Average Words per Turn for Students and Teachers in Baseline Transcripts

Date	Total Word Count per session		Total # of Turns per session		Average Words per turn	
	Teacher	Student	Teacher	Student	Teacher	Student
12.16.16	488	288	32	32	15	9
1.13.17	828	387	63	61	13	6

In sum, the numerical data show that the teachers were talking more in the baseline transcripts. A higher student participation rate and equal numbers of student/teacher turns did not necessarily yield a larger amount of student talk.

Reasoning words. We were interested not only in the *quantity* but also the *quality* of talk in terms of student engagement in the reasoning-based, collaborative discourse described in the CCSS standards. As described in the previous chapter, I used the reasoning words tool in Table 7 as a low proxy measurement to quantify student reasoning in the baseline transcripts. I examined the transcripts for three categories of reasoning words, according to function: speculating/proposing (e.g., *would*, *could*,

might), positioning/claiming (e.g., *think, agree/disagree*), and analyzing/generalizing (e.g., *because, but, so*) (Soter et al., 2009).³

Table 12 shows the usage of reasoning words across the two baseline transcripts, normalized to 15 minutes of transcript time. These numerical results show that before implementing the codesign, occurrences of reasoning words were relatively low: On average, students used about 11 reasoning words in total (across all students) per 15-minute discussion. Table 12 shows that a higher number of total speculating/proposing words (e.g., *would, could, might*) across all students were uttered on December 16, 2016 (8 words) than on January 13, 2017 (1 word). In addition, no positioning/claiming (e.g., *think, agree/disagree*) words were uttered on December 16, whereas in total, two positioning/claiming words were uttered on January 13. The same total number (6 words) of analyzing/generalizing words was uttered on both days. In general, these numbers speak to the relatively low incidence of reasoning words in the early baseline transcripts. This suggests that not only were students talking much less than teachers, but also that when students did talk, they were not articulating their reasoning and taking risks with language in ways that go beyond typical information-recall statements.

³ It is important to keep in mind, however, that reasoning words uttered by students as they read aloud from the text verbatim (as in direct quotations) were not coded and counted as reasoning words. Although I coded reasoning words presented in students' oral paraphrases of the text, I chose not to count reasoning words when students were reading the text verbatim because I was tracking reasoning words students used to *verbalize* their *own* reasoning.

Table 12

Reasoning Words According to Function in Baseline Transcripts, Adjusted to 15 Minutes

	12/16	1/13
Speculating & Proposing		
Would	1	1
Could/Can be	0	0
Should	5	0
Might/maybe	0	0
If	2	0
Positioning & Claiming		
I think	0	2
I agree/disagree	0	0
Analyzing & Generalizing		
Because	3	5
So	3	0
But	0	1
TOTAL	14	9

Reasoning words in the texts. To better understand and begin accounting for any shifts in reasoning words seen across the transcripts, I also calculated the occurrences of the above reasoning words in the actual texts that formed the basis of the text-based discussions in the baseline transcripts. Table 13 shows these counts: a total of 32 words on December 16 and a total of 4 words on January 13.

Table 13

Total Number of Reasoning Words in Texts Used for Discussions in Phase 1

	12/16	1/13
Speculating & Proposing		
Would	6	0
Could/can be	2	1
Should	4	0
Might/maybe	3	0
If	9	0
Positioning & Claiming		
I think	3	2
I agree/disagree	0	0
Analyzing & Generalizing		
Because	0	0
So	1	0
But	4	1
TOTAL	32	4

These numbers suggest that the higher number of speculating/proposing reasoning words uttered by students on December 16 (8 words) could potentially be attributed to the overall higher number of speculating/proposing reasoning words within the text that the students were referencing in the discussion that day. Remember that, though I did not count reasoning words read aloud, I did count reasoning words that were paraphrased from the text (e.g., “Because she [character in the text] told you, um, that other people should be responsible?”). That said, it was still too soon to understand if and to what extent the reasoning words uttered by students could be attributed to the occurrences of those reasoning words in the text or to other factors such as the kind of talk the teachers were fostering through the use of strategies. I continued to track the reasoning words in the texts over the course of the study in order to be able to make claims regarding shifts

in talk. Further results will be reported in Chapter 5.

Collaborative talk. Because of our interest in students' engagement with their peers' ideas, I also examined collaborative talk in the baseline transcripts using a low-inference proxy measure. To measure collaborative talk, I coded students' explicit references (by name or pronoun) to other students' contributions (see Table 8 in Chapter 3). This step was important because the CCSS.ELA-LITERACY.SL.5.1 states that students should "engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly" and "make comments that contribute to the discussion and elaborate on the remarks of others" (CCSS.ELA-LITERACY.SL.5.1). On December 16 and January 13, there were zero instances of students referencing one another's contributions by name or by pronoun.

Academic language for communicating and reasoning. Finally, because of our interest in whether students were using the explicitly taught language items conducive to high levels of discourse, I examine the students' use of this type of academic language in the baseline transcripts. Over the course of the study, I tracked if, and to what extent, students began to incorporate these kinds of academic language into their contributions to whole class discussions as teachers regularly engaged (on a weekly basis) in explicit instruction of these language items and while also implementing the full range of "academically productive talk moves" over time. Additionally, I wanted to understand whether any later shifts in discourse could be attributed to students taking on these language structures. During Phase 1 of the study, as noted in my field notes, students had

had some exposure to and explicit instruction of these language structures. In the baseline transcripts (December 16, 2016 and January 13, 2017) there was no evidence of students using academic words and phrases to express their views and to communicate with others in the discussions even though students were encouraged to use them when participating in the weekly class discussions.

Summary. In sum, the numerical data show that conversation was dominated by teacher talk in the baseline transcripts, regardless of the percentage of participating students. Although talk was interactive and teachers and students engaged in equal turn-taking, teachers' turns were usually twice as long as students' turns. Moreover, students' short, one-word, and phrasal responses and the low incidence of reasoning words suggest that students were not engaged in extended, reasoning-based discourse. Finally, the transcripts did not show evidence of students interacting with one another and collaboratively building on each other's ideas, as measured by students referencing one another's names and comments in the discussion.

Analysis of Examples From Classroom Discourse in Baseline Sessions

To better understand the nature of the talk prior to our systematic implementation of the scaffolds under study and to explore the underlying reasons for the participation patterns represented by the numerical data, I conducted a qualitative analysis of the transcripts. Through the analysis, it became evident that although the ultimate goal of discussion in Discussion Fridays was to facilitate participation, reasoning, and collaborative talk, early in the investigation (and in the academic year) other often important, yet competing, purposes for discussion led teachers to use forms of

instructional talk that contributed to the participation patterns discussed in the previous sections. To substantiate this explanation, I examine several episodes of whole class discussion, with particular attention to how the goals of the talk and subsequent teacher moves employed influenced student participation, reasoning, and engagement in collaborative talk. In particular, I noticed that teachers used discussion to support students in unpacking complex text, to instruct students on how to use textual evidence to support their claims, to elicit specific information from students, and to maintain student focus and participation in talk.

Episode 1: Unpacking Complex Text

One purpose I saw was that discussion was used to help students unpack the complex text. In an effort to support this work, teachers asked focused questions that narrowed the content down to specific issues that the teachers wanted the students to reflect on and understand. In the following example from 1/13/17, the objective of the discussion was to guide students' comprehension of an excerpt from Martin Luther King, Jr.'s speech "The Quest for Peace and Justice," which students had had the opportunity to listen to twice and discuss in small groups before the discussion. Teachers provided students with a prepared handout that contained excerpts from the speech the students had listened to, as well as images and guided questions to scaffold the students' understanding of the ideas presented in the text. The central idea of the focal text was this: Although modern human beings have achieved so much in terms of scientific and technological progress, they still suffer from "poverty of spirit," as reflected in the injustices of the world. After students had time to examine some of the textual language

and discuss the content in small groups, the teachers posed the question “Why, according to Martin Luther King Jr., have we not learned ‘the simple art of living together?’” and facilitated a whole class discussion. A portion of the discussion is excerpted below:

⁴Example 1, from January 13, 2017

Line Speaker: Discourse

16 **T: In that title, “The Quest for Peace and Justice,” what is this quest for?**

17 Ben: He wants a quest for peace and justice, for all black people.

18 **T: So, when you look at your paper, you can think about this, in the top section, what do you see here? Yeah.**

19 Layla: A building, a rocket ship, a bridge, and an airplane.

20 **T: What do we call *these*?**

21 Layla: Things

22 **T: These are things, what don’t you see in this picture?**

23 Ian: Humans.

24 **T: You don't see any people. On the other side, what do you see here?**

25 Layla: Humans.

26 **T: What are these humans asking for? What are they asking for, Dario, in the pictures, Dario? What are the people asking for in the pictures? Can you read what it says?**

27 Dario: “March in Washington for jobs and freedom.”

28 **T: What else?**

29 Dario: Equal rights.

30 **T: Are people asking for airplanes, bridges, and spaceships? No. What are they asking for?**

31 Sargis: Equal rights.

32 Dario: Jobs.

33 **T: Jobs, food, and...? (2 second pause)**

34 Amin: Equal rights.

Although the whole class discussion was interactive, with students actively responding to the teachers’ questions, the teachers guided the discussion with questions that converged on particular answers in order to help students achieve a basic

⁴ Note that the names used for the students are pseudonyms, and no matter who the teacher is (ESL teacher, general education teacher, IEP support staff, or myself stepping in as discussion facilitator, I use the letter T to represent the talk of the teacher/facilitator. See Appendix A for transcription conventions.

understanding of this complex text. In doing so, students had less opportunity to produce elaborated responses and to express complex thinking. For example, such questions can be seen in lines 16, 18, 20, 22, 24, and 26 below. In line 16, the teacher asks a question for which the answer is already provided in the title, essentially drawing attention to the key words in the title. The teacher asks, “In that title, ‘The Quest for Peace and Justice,’ what is the quest for?” Ben responds with “[. . .] a quest for peace and justice” and then adds “for all black people.” Then, in line 18, the teacher asks students what they see in the “top section” of their handout. The teacher is drawing students’ attention to images on the prepared handout as these images are intended to support students’ understanding of the language and concepts in the text. In lines 19, 21, and 23, students call out one-word answers and phrases rather than using complete sentences to express more complex thinking. Although these questions aim to guide students’ understanding of an important contrast presented in the text, which students appear to need in this particular context, the questions do not provide students with opportunities to articulate their ideas and explore diverse perspectives.

In terms of instructional moves, the teacher used questions that converged on a narrow list of lexical or phrasal answers. For example, in line 20, the teacher asks, “What do we call these?” The student responds, “Things.” Here the teacher wanted students to categorize these items as technological advancements or as material objects in order to elucidate Dr. King’s message, which is that although the human race has made much scientific progress, there is still a grave “spiritual and moral lag” that must be attended to. However, the question also suggests that there is one correct answer: the teacher ratifies

“things” by accepting the answer and moving on; taking it as connecting to the technological advances that are part of the contrast the teacher seeks to make. Then, the teacher moves on to the other side of the contrast, guiding students to identify the non-material, social justice issues that MLK is illuminating, asking in Line 26, “What are these humans asking for? What are they asking for, Dario, in the pictures, Dario? . . . Can you read what it says?” Dario replies, “March in Washington for jobs and freedom” (reading verbatim from the handout). Again, we see convergent questions, shorter turns from students, and students being invited to provide answers rather than expressing and developing their views through longer turns of extended discourse. This structure is an example of the IRE sequence (Mehan, 1979), in which the teacher asks a question, the student responds, and the teacher evaluates by moving on to a new question (signaling that the answer provided was correct, as in line 25) or continuing to pose more and more focused questions until a desired answer is provided (as in line 31, 32, 34).

I interpret the questioning approach as primarily concerned with scaffolding the concepts in the text and helping students understand the deeper meaning of the text, rather than providing space for students to analyze, synthesize, evaluate, and make sense of the text on their own. This comprehension goal outweighs the larger goal in place, which is to support students in engaging in reasoned, collaborative discourse. As a result, the students might not have had the opportunity to express their own interpretations and thoughts and justify their interpretations with reasoning and evidence from the text. In this transcript, as in the general quantitative baseline analysis, there are no incidences of students using reasoning words. This might also speak to the *tension* between providing

students with enough conceptual scaffolding in order to guide students' understanding of the text and allowing students to grapple with and make sense of the text through their own attempts at interpretation and reasoning. Even though the teacher's larger guiding question ("Why, according to Martin Luther King, Jr., have we not learned 'the art of simple living together?'"") is a higher order question that encourages students to think beyond literal terms and make their own attempts at interpretation, the teachers continue to use instructional moves that help the students establish a basic understanding of the material because students appear to need that additional conceptual scaffolding.

Finally, if students are not expressing their own interpretations to make sense of the text, they are also not making sense of the text collaboratively with their peers. As shown in lines 22–34, there is a ping-pong-like pattern of interaction: teachers ask a question and students respond to the question, followed by teachers raising a new question, and students again responding to the next question, and so on. In this excerpt, students followed the lead of the teachers, who held the interpretive authority, to walk them through the text. Therefore, there appeared to be little opportunity for students to agree and disagree with each other (no teacher moves; no instances of students doing this). In this transcript, as in the general quantitative baseline analysis, there are no incidences of students referencing each other by name or pronoun.

In general, this is a typical and sometimes necessary way of interacting in schools, as these concrete, text-based questions are important for helping students grasp content that may be difficult for them to understand. Nevertheless, we see that the instructional discourse does not yield the kind of reasoning-based, collaborative discourse elucidated

in the Common Core Listening and Speaking standards. This kind of talk was representative of other episodes throughout the early transcripts (and at times reemerged in later transcripts). This also suggests that although some of the talk moves were present in early transcripts (see Figure 2) to help students unpack complex text, they were not yet being wielded in ways that shaped opportunities for students to engage in reasoning-based, collective thinking.

Episode 2: Retrieving Textual Evidence

Another goal that characterized the talk of discussions during this period was for students to understand what “textual evidence” is and develop the habit of retrieving textual evidence to support their claims in a whole class discussion setting. As I show below, the focus on textual evidence often led to the IRE discourse sequence in a way that restricted students’ chance to produce elaborated answers, to articulate their reasoning, and to engage with their peer’s ideas.

In the episode I examine here, the focal text being discussed “Should Students Share Responsibility for Each Other’s Behavior in School?” (Word Generation, Unit 5.03, Reader’s Theater; SERP, n.d.) centered on four characters who exchange their differing perspectives on the “Good Behavior Game,” a game invented by a research team at the University of Kansas: In this game, if any one individual in a group is disruptive, the whole group loses a point. The characters in the text consider the pros and cons of playing this “game” in their school setting (e.g., if one student is disruptive in class, would it be fair to take away recess for the whole class?). The four characters’ names in the Reader’s Theater text are Christina, Stavros, Tomoko, and Elena.

In this discussion, the teachers asked students to identify each character's perspective (Cristina's, Elena's, etc.), and then to discuss whether they believe that students (in general) should share responsibility for each other's behavior in school. Although the larger question was intended to promote reasoned, collaborative discourse, the teachers mainly emphasized the importance of students using textual evidence to verify the claims made about the characters in the text because the students had not yet learned this skill. The teachers did so in order to encourage evidence-based talk, which was important to establish prior to engaging students in collaborative talk. Lines 39 through 48 exemplify this exchange.

Example 2, from 12/16/16

- Line **Speaker: Discourse**
- 39 **T: Teams. What about for Stavros? What do you think Stavros' perspective is? Amin, what did you have for Stavros?**
- 40 Amin: Um, he said teams should include everyone except, no. Teams are never fair, so he doesn't want to play a game.
- 41 **T: And what does Stavros say that makes you think that?**
- 42 Amin: Stavros says, um - (2 second pause)
- 43 **T: Okay, what number is it?**
- 44 Ian: Five.
- 45 **T: Yeah.**
- 46 Amin: Yeah. "Let me get this straight, he, accidentally" (2 second pause) {Amin struggles with reading the next word in the text.}
- 47 **T: Knocked over.**
- 48 Amin: "knocked over the /tr-tr-/ trashcan when he wanted to sharpen his pencil. If he were on my team, the good behavior game, then he would lose a point." Because, um, if he was on a team, they'd lose.
- 49 **T: Okay. Does anybody else have another piece down from Stavros?**
- 50 Ian: Yes. Teams are never fair, so he doesn't want to play the game.
- 51 **T: What number is that?**
- 52 Ian: uh, fourteen.
- 53 **T: Line number 14 there. He says, "I don't want to"...?**
- 54 Ian: Play.
- 55 **T: "I don't want to play." {T repeats line from the text.} So, you could find a piece of evidence, which is pretty straight-, you know which is clear. Then, what's Tomoko's perspective? Sara, what's Tomoko's**

perspective?
 56 Sara: In the Japanese school it's everyone's responsibility.
 57 **T: Okay, and what line number did you find it from?**
 58 Sara: um, twelve.
 59 **T: 12, and what does Tomoko say?**
 60 Sara: "In Japan teachers would say that we had to solve our problems together," "and if two of us were fighting, everyone would be expected to participate in first figuring out what happened."

Consider the very first set of questions and responses in lines 39–44. The teacher asks for Stavros's perspective, then responds to Amin's response by asking him to find textual evidence, including the line numbers. A student (Ian) in the class calls out the actual line "five" from the text, and Amin goes on to read verbatim from the text in lines 46 to 48. This pattern is repeated numerous times through this transcript.

In the above example, the primary moves used were Dig Deeper moves, which support students to provide evidence and/or deepen their reasoning. However, in this case, the move was embedded in an IRE discourse sequence. Consider how the teachers asks questions such as "What does Tomoko say?" or "What line number did you find that from?" This focus on textual evidence signaled to students a primary activity of hunting for "correct" samples of evidence in the text, while teachers evaluated the provided evidence before moving on to the next question. This led, perhaps inadvertently, to an IRE pattern where the teacher checks to see if students are identifying relevant textual evidence. For example, the following exchange takes place in an early section of the discussion:

Example 3, from 12/16/16

Line	Speaker: Discourse	Code
14	T: Okay, can anybody tell us what Christina says? Yeah, can you tell us, Max? What does she say?	I

- 15 Max: She said, “Every student should be responsible for he or her behavior.” R
- 16 **T: Okay. That’s what she said. Did Max give us some evidence? Did Max give us some evidence?** E
- 17 Ss: Yes. R

In the above examples, we know that the teacher accepted the evidence when he or she responded with an “okay” or simply moved on to the next question.

Although students were providing evidence-based responses, the discourse itself did not eventually yield the kind of extended, reasoning-based, collaborative discourse for which the CCSS calls. First, students’ participation was often limited to the sought-after line number or quotation from the text, and teacher talk outweighed student talk. For example, in lines 43–60, the teacher asks, “Does anybody else have another piece from Stavros?” The student responds, “Yes. Teams are never fair, so he doesn’t want to play the game.” The teacher asks, “What number is that?” The student responds, “uh, fourteen.” The teacher confirms the answer by saying, “Line number 14 there. He says, ‘I don’t want to’ . . . ? (2 second pause)” and invites the student to complete the sentence. Ian says, “Play.” The teacher than again validates the student’s response: “‘I don’t want to play.’ {T repeats the line from the text.} So, you could find a piece of evidence, which is pretty straight-, you know which is clear. Then, what’s Tomako’s perspective? Sara, what’s Tomako’s perspective?” In these exchanges, the teacher asks for evidence, the students retrieve evidence or line numbers from the text in short responses, and the teacher moves to the next question after validating a response. In this discussion context, the use of Dig Deeper moves alone for the purpose of getting students to retrieve information from the text does not yield elaborated responses.

Second, because students were generally pulling out quotations from the text to support a point within the IRE sequence, they did not have opportunities to verbalize their reasoning. That is, they paraphrased the character's reasoning, rather than themselves reasoning about the various perspectives presented in the text or whether or not a character was justified for having a particular opinion. When students were uttering some of the speculating/proposing reasoning words, they were mostly referencing phrases from the text verbatim or paraphrasing the text. For example, in Line 60, Sara says, "In Japan teachers *would* say that we had to solve our problems together," "and if two of us were fighting, everyone *would* be expected to participate in first figuring out what happened." Although this passage shows the student using some speculating/proposing reasoning words, the student read the words verbatim from a text rather than express her own reasoning. This tendency can be seen again in another example from the same transcript:

Example 4, from 12/16/16

Line Speaker: Discourse

27 **T: Evidence. So, Christina wants to be responsible for her own behavior. That's what she said. What about for Elena? What's Elena's perspective? Did you answer it, SQ? What do you think Elena's perspective is?**

28 Sara: Um, every student has some, um should work on a team.

29 **T: Okay. Do you have a piece of evidence to support that? What does Elena say in the text?**

30 Sara: It says "So he won't have so many accidents" here "maybe next time Nelson needs a pencil, someone from his team will offer him one."

31 **T: Okay, so you have every student should help Nelson when he makes a...?**

32 Amin: a mistake?

33 **T: A mistake. Did anything have anything different for Elena's perspective? Yes, Ian, what did you have?**

In the above examples, the teachers emphasized the importance of using textual evidence and supported students to practice this skill. Although students used reasoning words when they drew evidence from the text (which is certainly a key component of reasoning), they seldom used reasoning words to verbalize their own reasoning. At one point in the discussion, a student did use his own words to justify his own point about the character in line 48: “Because, um, if he was on a [the same] team, they’d lose.” There is some evidence of the student beginning to articulate his reasoning. However, Amin did not have a chance to continue and further develop his reasoning. As seen in line 49, the teacher proceeds to turn the discussion to others, “Does anyone else have another piece of evidence from Stavros?” This shows that the teacher’s main concern in this discussion was for students to learn how to retrieve relevant pieces of evidence from the text to support a point.

Third, although referring to textual evidence to support one’s claims is certainly a characteristic of quality collaborative text-talk, the discussion never actually became collaborative because of the competing learning goal. This was a general trend in the early transcripts, where students interacted with teachers to answer the teachers’ questions and provided textual evidence to support their claims when the teachers asked them to. The interactive patterns between teacher and student did not yet allow for students negotiating, building on, and agreeing or disagreeing with one another’s ideas.

For example, early on students mainly addressed the teachers’ comments and questions without addressing their peers or referring to other students’ comments. Teachers asked questions that led students to scan for and retrieve specific textual

information. In some instances, teachers asked, if “anybody else has anything different.” For example, in line 29, the teacher asks: “Okay. Do you have a piece of evidence to support that? What does Elena say in the text?” In Line 33, the teacher asks another question: “Did anybody else have anything different for Elena's perspective? Yeah Ian, what did you have?” This pattern repeats throughout the transcript. Though this kind of questioning could potentially invite students to build on each other’s ideas, instead this becomes part of a serial questioning pattern leading students to offer their own answers or responses and to practice identifying textual evidence. This is especially evident when students read out verbatim quotes, line numbers, or complete the teacher’s sentence from the text as seen in lines 52, 53, 54, 58, 60. It becomes evident that though students are learning how to develop their reasoning with textual evidence, they do so without actually explaining or verbalizing their reasoning. Although this form of questioning allowed students to share out their answers, students do not appear to be responding to, building on, or evaluating one another’s ideas.

In one instance early in the transcript in line 6, the teacher did in fact call on other students to “help out” another student in identifying textual evidence from the text. Later, in line 14, the teacher once again tries to get more students to “help out” with the same question: “Okay, can anybody tell us what Christina says? Yeah, can you tell us, Max? What does she say?” Although these examples are evidence of the teacher attempting to get students to talk with each other, instead, students appear to be trying to say what they think is the “right” answer rather than engaging in meaningful negotiation with one another and or exploring diverse perspectives. This is evident in lines 9 and

then 14. After Max finally identifies the relevant piece of evidence from the text, the teacher validates this response in lines 15 and 17 and credits Max.

Example 5, from 12/16/16

Line Speaker: Discourse
2 **T: So Thao, one more time, what does she [the character in the text] think?**
3 Thao: Every student should be responsible for his or her behavior.
4 **T: Okay, so what piece of evidence did you have? What does Christina say that makes you think that every student should be responsible for his or her behavior...?**
5 Thao: um (2 second pause)
6 **T: Oh, someone wanna help out Thao? Yeah, Fatima, a piece of evidence. What does she say in the reading?**
7 Fatima: um, in this, um (2 second pause)
8 **T: In this, what does she say that makes you --**
9 Fatima: Because she told you, um, other people should be responsible?
[crosstalk]
10 **T: What does Christina say?**
11 Fatima: I don't know.
12 Mark: I forgot.
13 **T: Okay, can anybody tell us what Christina says? Yeah, can you tell us, Max? What does she say?**
14 Max: she said "every student should be responsible for his or her behavior."
15 **T: okay that is what she said. Did Max give us some evidence?**
16 Aisha: yes.
17 **T: it says right there. Max can you read what it says?**
18 Max: "Every student should be responsible for his behavior."

As I noted earlier, the objective of this lesson was to help students learn what it means to identify relevant textual evidence and use it to support claims. This learning objective is valuable. After all, students cannot have an effective discussion if they do not understand the text or know what textual evidence is and how to use it to support a claim. Although these exchanges are useful and necessary for fostering effective discussion, at this early point in the investigation, students are not yet producing the kind of talk the CCSS requires, in which students build and support claims with evidence while *also* engaging with and examining their peers' ideas.

Episode 3: Elicitation and Engagement

Other purposes for “discussion” included eliciting specific information from the students in order to reinforce key points and/or to maintain student engagement and focus. In other words, sometimes the process of inviting students to provide words was used to emphasize the importance of a term or idea. Other times, the teachers used this technique to ensure that the class was paying attention and following along. In the following example, the teacher wanted to make sure that the class understood the curricular focus of Discussion Fridays.

Example 6, from 1/6/17

Line Speaker: Discourse

83 **T: You have to listen. If you’re gonna make connections between what people say, you’re gonna have to listen. Remember, you have this idea, Victor, of citizenship. What are the three words that go with citizenship?**

84 Victor: Rules, responsibilities, and rights.

85 **T: Rules responsibilities, and rights. Over time you’re gonna want to think about how do rules, responsibilities, and rights refer to...? (2 second pause)**

86 Ss: You. Us?

87 **T: What’s the big idea?**

88 Victor: Citizenship.

89 **T: Citizenship.**

90 **T: Dario, what’s the idea we’re talking about?**

91 Dario: Connect to other people.

92 **T: Great, what’s the topic were talking about?**

93 Dario: Citizenship.

Although this interactive discourse pattern was necessary to clarify and draw attention to particular information and to keep students engaged with the curricular focus throughout the discussion, it also resulted in limited oral participation, reasoning, and collaborative talk among students and illustrates the participation patterns that emerged from the numerical data.

In another example of IRE-type discourse, teachers elicited specific relevant text-world connections to aid students in understanding the content of the day. In this example, the teacher focused on the characteristic of perseverance, its role in individualism and community pursuits, and how it relates to the theme of citizenship. Once again, the teacher guided the flow of information in the discussion in an IRE-type manner and by often eliciting particular words or phrases from the students.

Example 7

Line Speaker: Discourse Text from 2/3/17

91 **T: I'm looking at that word "perseverance." T and I were talking about this the other day. Something happened this week that made me think of the word perseverance. Can you think of something that may have happened this week, in the news?**

92 Sara: I don't watch the news.

93 **T: That made you think the word "perseverance." Sara, can you think of anything? It was big news. Big, big, big news.**

94 Sara: I really don't know.

95 **T: Fatima?**

96 Fatima: The Super Bowl.

97 **T: What do you mean about the Super Bowl? What's that got to do with perseverance?**

98 Fatima: They worked together.

99 **T: Who worked together?**

100 Fatima: The big team.

101 Ss: The Pats.

102 **T: What team?**

103 Fatima: The Patriots.

104 **T: The Patriots worked together to do what?**

105 Ss: Win! Win!

106 **T: Win what?**

107 Ss: The Super Bowl.

108 **T: Mark, can you tell me anything about perseverance? What does perseverance mean?**

109 Mark: Hardworking.

110 **T: Hard working. How were the New England Patriots hard working, Mark?**

111 Mark: Because they took time. They practiced and practiced. Practice makes perfect.

112 **T: Did you watch the game?**

- 113 Mark: I did not watch the game.
114 **T: Did you hear a lot of talk after the game?**
115 Mark: I heard about it.
116 **T: What did you hear about the game?**
117 Mark: I heard about the Patriots.
118 **T: Were they winning in the beginning?**
119 Mark: No, yeah, they were.
120 **T: Were they winning in the very beginning?**
121 Mark: Not the very beginning. They were losing so they had --
122 **T: Not in the very beginning. So what did they have to do that begins with a P?**
123 Mark: Practice!
124 **T: Practice. And the other word up there that -**
125 Mark: Perseverance.
126 **T: They had to persevere. Okay, who else wants to talk about that?**

This exchange substantiates the findings of the Needs Assessment, while further supporting the participation patterns that surfaced from the numerical data. Student turns were short, often consisting of words, phrases, or simple sentences. For example, students called out words like “win,” “the Patriots,” “practice,” and “perseverance” to answer convergent questions with limited or singular answers. Moreover, the teacher, not the students, brought in the text–world connection. Thus, students did not draw their own connections: instead, they were guided to unpack the teacher’s connection. Although the exchange between teacher and students was interactive and involved rapid turn-taking, students filled in the blanks of what seemed to be an already-made conclusion about teamwork, perseverance, and beating the odds.

Summary

In summary, teacher talk outweighed student talk in the baseline transcripts, regardless of the percentage of participating students. Although talk was interactive and teachers and students engaged in equal turn taking, teachers’ turns were usually twice as

long as students' turns. Moreover, students' short, one-word, and phrasal responses and the low incidence of reasoning words in their talk suggest that students were not engaged in extended, reasoning-based discourse. Finally, there was little evidence of students collaboratively building on each other's ideas.

Qualitative analysis further illuminated the numerical data. First off, we were gathering data on what discussions were like early in the investigation prior to beginning the systematic implementation of our codesign. Moreover, early in the investigation, teachers used discussion to carry out a multitude of learning objectives, including to teach students *how to* draw textual evidence to support their ideas, to emphasize correct answers and to guide students' comprehension of a text, to teach the meaning of a content-specific vocabulary word in context, to clarify instructional directions, and to elicit recall and specific information (textual or other) deemed relevant by the teachers to emphasize a concept. These kinds of learning objectives may best be achieved through authoritative-interactive communication—when the teacher guides the talk in a specific direction, such as to make an instructional point or to introduce a concept that students are unlikely to discover on their own (Mortimer & Scott, 2003). In fact, Mortimer and Scott (2003) found that effective, dialogically oriented teachers navigate across multiple communicative approaches for different instructional purposes. Nonetheless, when the goal is to help students engage in and practice participating in *collaborative, reasoning-based discourse*, discussions may require emphasis on different forms of instructional talk and other scaffolds (e.g., providing linguistic scaffolds, building background information, etc.) to shape opportunities for participation, reasoning, engagement with

each other's ideas, and language development.

Although it was important to the teachers to address these competing instructional goals early on, these early participation patterns simultaneously set the stage for our systematic implementation of APT strategies and the scaffolding (via multiple iterations) of language functions for communication and reasoning. We were particularly interested in understanding if and how specifically aligning the use of instructional discourse to the overarching discussion goals delineated in the CCSS resulted in shifts in student talk. We also wanted to understand to what extent, if any, the provision of functional language scaffolds supported shifts in student talk. In the next chapter, I discuss how student discourse shifted in response to the implementation of these particular strategies.

CHAPTER 5:
RETROSPECTIVE ANALYSIS: EXAMINING SHIFTS IN WHOLE CLASS
DISCOURSE

In response to the needs identified in the previous chapter, my codesigners and I implemented APT talk strategies and the explicit instruction and scaffolding of academic language for communication and reasoning as described in Chapter 3. In this chapter, I briefly review the implemented strategies. I then describe shifts in classroom discourse that occurred, possibly in response to these strategies, using methods that parallel those used in the previous chapter. That is, I first use quantitative measures to document shifts in student participation, reasoning, and academic language use. I then further examine these shifts through qualitative analysis and interpreting the transcripts. Ultimately, the purpose of this analysis is to refine our initial design conjectures and develop useful principles for educators trying to foster collaborative, reasoning-based discourse in similar classroom contexts.

Scaffolds in the Codesigned Intervention

Recall from Chapter 3 that the codesign involved two main components: (a) implementing APT moves to support participation, reasoning, and dialogic discourse and (b) explicitly teaching and scaffolding academic language (discussion stems and frames) to support high-quality dialogic exchange of ideas (see Chapter 3 for further details of these scaffolding strategies and their implementation). The Codesigned Intervention Summary (Table 5) presents a schedule of when particular strategies were introduced.

The systematic implementation of the four types of talk strategies began on January 20, 2017 with Expand and Listen/Repeat goals, then moved to Dig Deeper and Think with Others goals, and ended on May 19, 2017 (the final class discussion).

Another part of the codesign included the explicit teaching and scaffolding of the particular language structures (i.e., the words and sentence stems students need to participate and communicate in the discussion), through multiple iterations, that complemented the four APT goals. For example, if the language function is to share one's opinion, the language structure uses the sentence starters *I think, in my opinion, and from my perspective* (see Appendix D, Student Cheat Sheet: Academic Language Functions, for a complete list of language structures explicitly taught to students over the course of the study; see Chapter 3 for a full description of the strategies used by teachers to introduce and support these structures).

Quantitative Analysis

In the following section, I examine shifts in teachers' use of APT moves as well as shifts in student discourse with particular attention to participation (amount of talk), utterance of reasoning words, engagement in collaborative talk, and use of explicitly taught academic language.

Examining Shifts in Instructional Discourse

I first focused on identifying how teachers implemented the planned talk strategies. Figure 4 displays the frequency of four types of APT moves (Expand, Listen, Dig Deeper, Think with Others) in teacher discourse throughout the study. As described in Chapter 3, in the early conversations (12/16 and 1/13, included here for reference),

teachers most often used Dig Deeper moves to help students provide textual evidence for their thinking. By contrast, teachers only very rarely used strategies that helped individual students share and elaborate on their thinking (Expand moves), listen carefully to their peers (Listen moves), and think with and build on their peers' ideas (Think with Others moves).

A trend in the transcripts over time was the considerable increase in the use of the Expand and Think with Others moves. The data show that teachers incorporated the four types of APT talk moves regularly in each discussion from March 10 through May 19. However, teachers used Listen and Dig Deeper moves to a lesser extent.

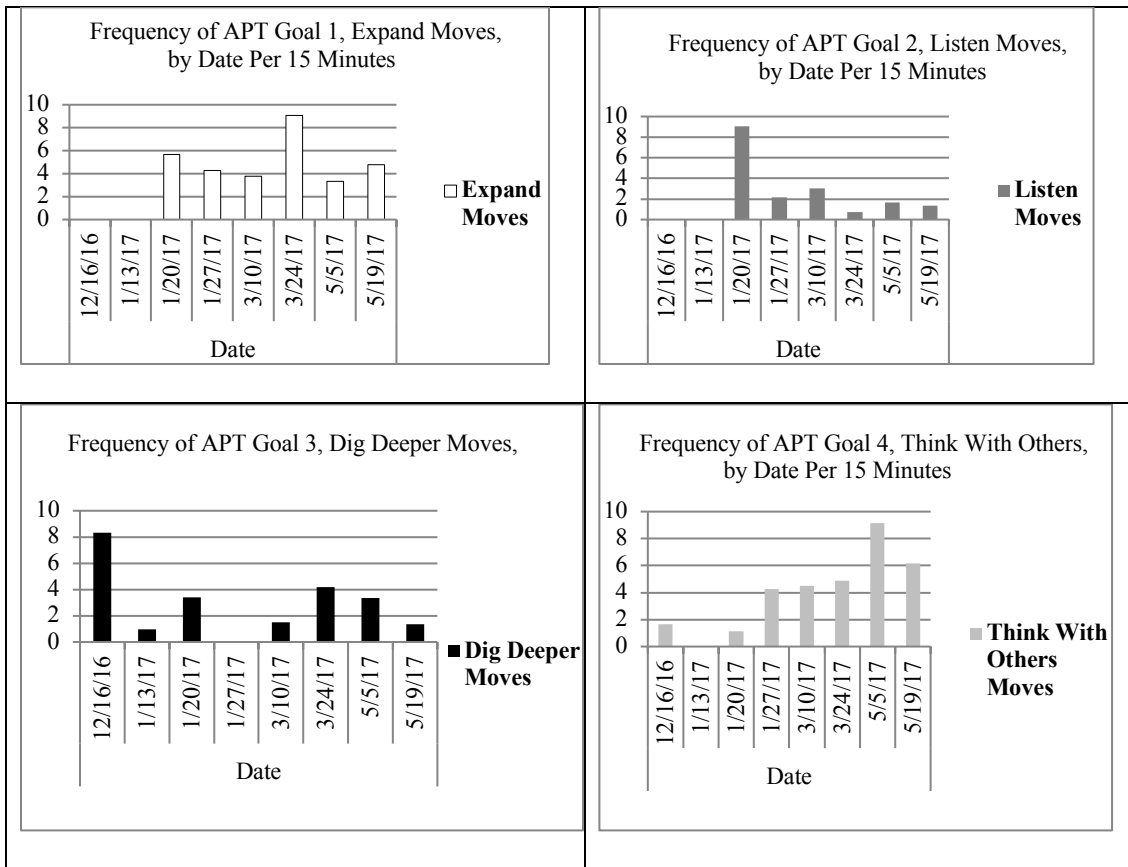


Figure 4. APT moves frequency over the course of the study.

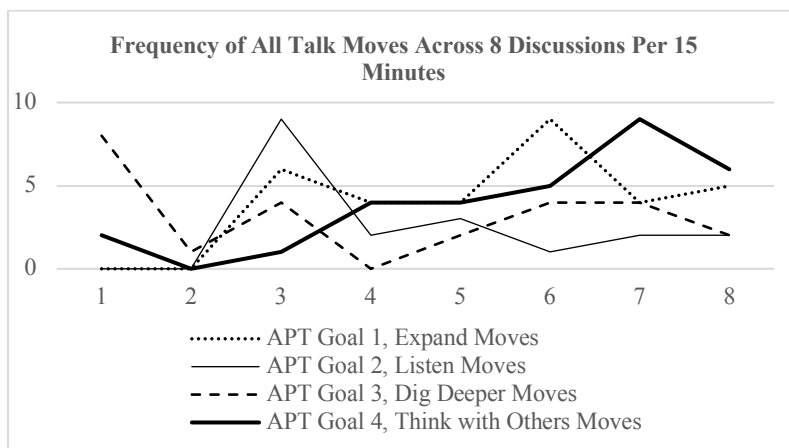


Figure 5. All APT moves frequency over the course of the study.

Examining Shifts in Student Discourse

Next, I was interested in understanding shifts in how much students were participating, reasoning, and engaging in dialogic discourse, and in measuring students' use of the explicitly taught academic language. This parallels the challenges first identified in the Needs Assessment (see Table 4, p. 84).

Student participation in discussion. Student participation increased over the course of the study, as evidenced in student–teacher word count ratios, average words per turn for students and teachers, and the percentage of students participating in discussions throughout the study.

The first notable change was that students began to talk more. In general, student word count per 15 minutes increased during the study. Moreover, student word count in relation to teacher word count per 15-minute interval also increased. Figure 6 demonstrates that although teacher word count was almost double that of student talk on both December 16 and January 13, student word count surpassed teacher word count on January 27, March 24, and May 5. In addition, student word count was almost double that of teacher word count on May 19. That is, by the end of the study, not only were students talking more per 15-minute interval than in the baseline transcripts, but students were also talking more than teachers.

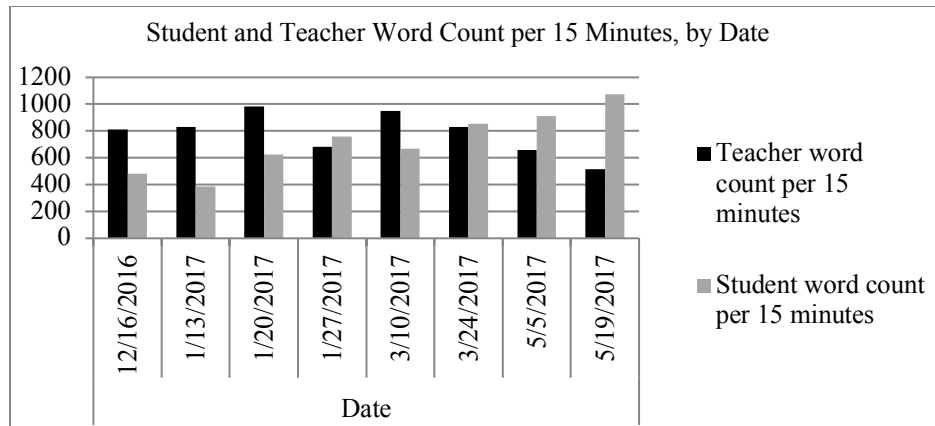


Figure 6. Student and teacher word count per 15 minutes over the course of the study.

Displaying the data differently, Figure 7 shows that the ratio of student talk to teacher talk was .59 on December 16 and .47 on January 13. Although in the early transcripts, the amount of student talk was nearly half that of teacher talk, the trend in the line graph shows a general increase in student talk over time, with students expressing twice the words of teachers on May 19.

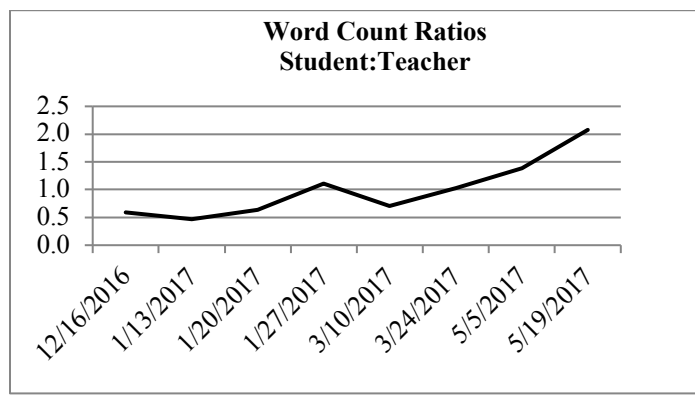


Figure 7. Student/teacher word count ratio over the course of the study.

In addition, students took longer turns over time. This change is evident by comparing average words per turn by students and teachers before and after the implementation of the codesign. In general, as seen in Table 14, average words per turn for students increased from 9 words per turn on December 16 to 22 words per turn on January 27. Over the last five days, students' turns ranged from an average of 17-40 words. In fact, it was on the last day observed, May 19, students averaged 40 words per turn. As Figure 8 shows, although student turns were shorter than teacher turns in the first three transcripts, students' average words per turn surpassed that of teachers in most of the remaining discussions.

Table 14

Average Words per Turn for Students and Teachers Across the Study

Date	Total Transcript Minutes	Total Word Count per session		Total # of Turns per session		Average Words per turn	
		Teacher	Student	Teacher	Student	Teacher	Student
12.16.16	9 min.	488	288	32	32	15	9
1.13.17	15 min.	828	387	63	61	13	6
1.20.17	14 min.	919	582	52	59	18	10
1.27.17	14 min.	639	708	41	32	16	22
3.10.17	21 min.	1392	981	56	58	25	17
3.24.17	21 min.	1165	1196	62	64	19	19
5.5.17	18 min.	791	1096	45	46	18	24
5.19.17	22 min.	759	1572	38	40	20	40

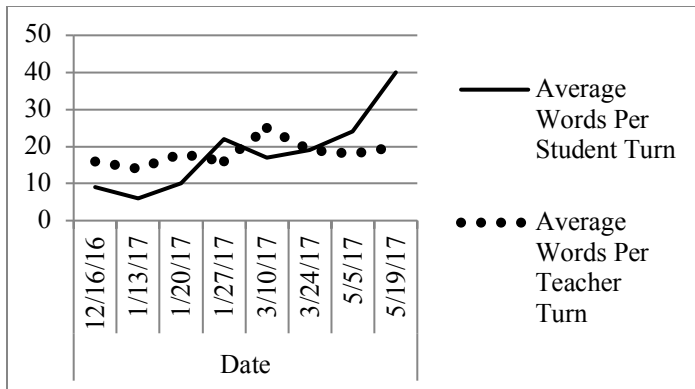


Figure 8. Average words per turn for students and teachers.

Finally, as in the analysis conducted on the baseline transcripts, I examined the percentage of students participating in each discussion over the course of the study.

Figure 9 shows that in general, the percentage of participating students increased during the study, although it is not that strong a trend. From December 16 through January 27, participation dipped below 75% for three of the discussions; however, from March 10 through May 19, participation remained above 75% for all four discussions.

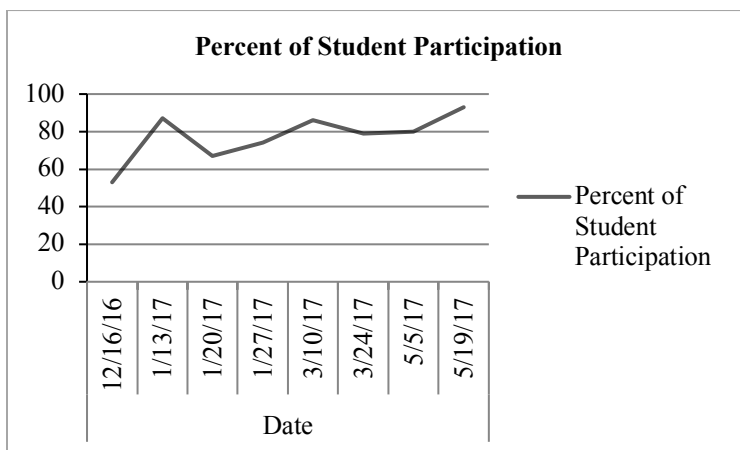


Figure 9. Percentage of student participation across the study.

As described in Chapter 4, the insights garnered from the information about participation alone was limited because these percentages (even the high ones) cannot show the quality of student talk as it related to reasoning, engagement with other students' ideas, or the use of academic language. Even when almost 90% of the students participated, as in the discussion on January 13, there was little, if any, evidence of students verbalizing their own reasoning and or referring to one another's comments in the discussion (e.g., agreeing/disagreeing, restating peers' ideas, adding onto ideas). On the other hand, on May 19, when close to 90% of the students participated, there *was* ample evidence of students verbalizing their own reasoning and building on the ideas of their peers (as I will discuss in the coming analysis). Thus, it became clear that in different discussions with roughly the same amount of students participating, there can be a great variance in quality.

In general, trends in the discussions included an increase in the percentage of participating students, student word count in relation to teacher word count, and average words per student turn over the course of the study. Put differently, over time students appeared to talk more in discussions and they also provided longer, elaborated responses. On the other hand, teacher-dominated talk in discussions lessened over time. This analysis shed light on the change in student participation, but left much to be discovered in terms of the quality of talk and reasoning.

Reasoning. Next, I continued to track the extent to which participants were verbalizing their reasoning in the post-baseline transcripts. Ultimately, my codesigners and I were interested in understanding if and how students' engagement in reasoning

evolved over the course of the study. Just as in the baseline analysis, I calculated students' use of reasoning words. I examined the post-baseline transcripts for three types of reasoning words, according to function: speculating/proposing (*would, could, might, should, if*), positioning/claiming (*think, agree/disagree*), and analyzing/generalizing (*because, but, so* [Soter et al., 2009]; see Reasoning Words Tool, Table 7).

The analysis revealed that students verbalized their reasoning with increasing frequency over the course of the study. As Table 15 shows, before implementing the codesign, occurrences of reasoning words per 15 minutes were relatively low (14 total on 12/16 and nine total on 1/13). However, as teachers continued to systematically implement the codesigned intervention, the frequency of reasoning words increased. Table 15 reveals that students used about 54 reasoning words on average in the post-baseline discussions, compared to an average of about 12 reasoning words in the baseline discussions. Reasoning words that indicate speculation or analysis were more prevalent in the post-baseline transcripts (Figure 10). I found that analyzing/generalizing words, *because* and *but*, and the speculating/proposing words, *if, might/maybe*, and *would* had the largest increase in frequency after the codesign had been formally implemented (see Table 15). Figure 10 shows the trends in students' utterance of the three types of reasoning words.

Table 15

*Students' Number of Reasoning Words per Discussion**

	12/16	1/13	1/20	1/27	3/10	3/24	5/5	5/19
Speculating/ Proposing								
Would	1	1	2	1	5	10	12	3
Could/Can be	0	0	3	1	3	8	3	6
Should	5	0	0	2	4	8	1	9
Might/maybe	0	0	6	0	10	6	10	5
If	2	0	6	0	8	10	11	23
Positioning/ Claiming								
I think	0	2	3	1	6	5	3	8
I agree/disagree	0	0	0	0	0	1	3	1
Analyzing/ Generalizing								
Because	3	5	10	13	8	6	16	14
So	3	0	0	5	5	3	3	7
But	0	1	0	9	5	5	4	10
TOTAL	14	9	30	32	52	60	66	85

* Counts are per 15 minutes of discussion

It is important to note, however, that even though incidences of students using speculating/proposing and analyzing/generalizing words seem to increase the most based on the data in Table 15 and Figure 10, this data *only* reflects the use of three positioning/claiming reasoning words: *think*, *agree*, and *disagree*. It does not account for other units of language that I analyzed when tracking students' use of academic language (e.g., *in my opinion*, *like what Mario said*, *adding to Mia's idea*, *I mean*) that may also be considered as chunks or units of language used by students in the positioning of the self and of others in the context of interactive discussions, which also increased in frequency across the study. Thus, even though speculating/proposing and analyzing/generalizing

words appeared to increase the most in this visual representation, Figure 10 does not account for other positioning/claiming units of language that also increased over time. Later in the chapter, I conduct an analysis of students' use of explicitly taught academic language, which also includes other variations of positioning/claiming units of language.

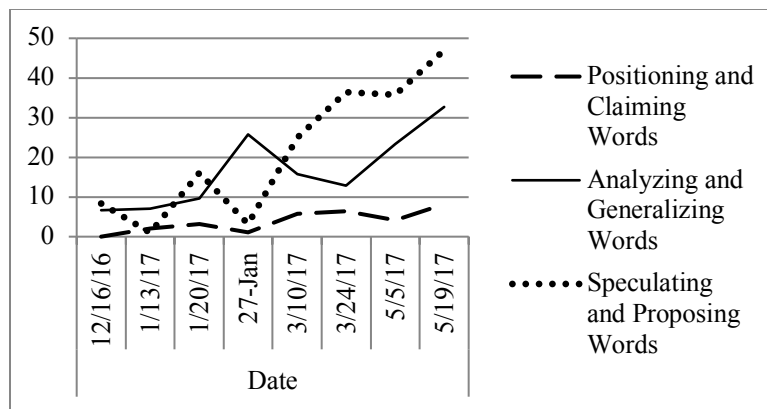


Figure 10. Trends in students' utterance of reasoning words.

Reasoning words in the texts. Next, I counted the reasoning words in the remaining texts that were the focus of lessons after the baseline transcripts. To explore whether or not students' use of reasoning words could be attributed to the language in the text, I conducted a comparative analysis (see Table 16). Additionally, I conducted a correlational analysis to investigate the relationship between the number reasoning words in the text and students' use of reasoning words in discussion (See Table 17 for complete pairwise correlation matrix). I found that students' use of reasoning words in discussions could not be attributed to the number of reasoning words in the text (Pearson $r = .0872$, $n = 8$, $p = .8373$; a non-significant correlation).

Table 16

Total Number of Reasoning Words in Texts (T) and Reasoning Words Uttered by Students (S) Across the Study

Word	Dec. 16		Jan. 13		Jan. 20		Jan. 27		Mar. 10		Mar. 24		May 5		May 19	
	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S
Speculating and proposing																
Would	6	1	0	1	1	2	1	1	0	5	2	10	2	12	1	3
Could/can	2	0	1	0	1	3	3	1	0	3	1	8	0	3	2	6
Should	4	5	0	0	1	0	4	2	0	4	3	8	2	1	6	9
Might/maybe	3	0	0	0	2	6	1	0	0	10	1	6	3	10	1	5
If	9	2	0	0	4	6	4	0	0	8	4	10	4	11	6	23
Positioning and claiming																
I think	3	0	2	2	0	3	6	1	0	6	2	5	1	3	1	8
I agree/disagree	0	0	0	0	0	0	0	0	0	0	1	1	1	3	0	1
Analyzing and generalizing																
Because	0	3	0	5	5	10	4	13	0	8	2	6	2	16	2	14
So	1	3	0	0	4	0	1	5	0	5	1	3	5	3	1	7
But	4	0	1	1	2	0	2	9	1	5	7	5	2	4	2	10
Total	32	14	4	9	20	30	26	32	1	52	24	60	22	66	22	85

Note. Dec. = December; Jan. = January; Mar. = March.

Table 17

Summary of Pairwise Correlations (N = 8)

Variables	Correlation	95% CI		<i>p</i>
		<i>LL</i>	<i>UL</i>	
T.Goal2Moves				
By T.Goal1Moves	0.4173	-0.4070	0.8670	0.3036
T.Goal3Moves				
By T.Goal1Moves	-0.1164	-0.7588	0.6409	0.7838
By T.Goal2Moves	-0.0276	-0.7183	0.6905	0.9483
T.Goal4Moves				
By T.Goal1Moves	0.4138	-0.4106	0.8660	0.3082
By T.Goal2Moves	-0.1649	-0.7790	0.6107	0.6964
By T.Goal3Moves	-0.0174	-0.7133	0.6958	0.9674
S2S				
By T.Goal1Moves	0.6430	-0.1128	0.9274	0.0855
By T.Goal2Moves	-0.0096	-0.7095	0.6998	0.9820
By T.Goal3Moves	-0.0335	-0.7211	0.6874	0.9373
By T.Goal4Moves	0.8533	0.3728	0.9729	0.0071
S#R. Wds				
By T.Goal1Moves	0.6818	-0.0440	0.9365	0.0626
By T.Goal2Moves	0.1619	-0.6127	0.7778	0.7017
By T.Goal3Moves	-0.1340	-0.7663	0.6302	0.7518
By T.Goal4Moves	0.7989	0.2156	0.9620	0.0174
By S2S	0.9280	0.6455	0.9872	0.0009
Txt#R. Wds				
By T.Goal1Moves	0.1695	-0.6078	0.7809	0.6883
By T.Goal2Moves	-0.0537	-0.7307	0.6766	0.8996
By T.Goal3Moves	0.5263	-0.2836	0.8979	0.1803
By T.Goal4Moves	0.2603	-0.5442	0.8154	0.5335
By S2S	-0.0128	-0.7111	0.6982	0.9760
By S#R. Wds	0.0872	-0.6579	0.7460	0.8373
AL Wds				
By T.Goal1Moves	0.5509	-0.2514	0.9045	0.1571
By T.Goal2Moves	-0.0837	-0.7445	0.6599	0.8437
By T.Goal3Moves	-0.1439	-0.7704	0.6241	0.7339
By T.Goal4Moves	0.7320	0.0565	0.9478	0.0390
By S2S	0.9194	0.6099	0.9856	0.0012
By S#R. Wds	0.9452	0.7203	0.9903	0.0004
By Txt#R. Wds	-0.0290	-0.7190	0.6898	0.9456

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Academic language. Quantitative analysis also revealed a shift in students' use of the explicitly taught academic language over the course of the study (See Appendix D, Student Cheat Sheet: Academic Language Functions, for explicitly taught terms organized by APT talk goal). This analysis is important for several reasons. First, as Figure 11 shows, the most notable increase in use occurred in Expand and Think with Others academic language. Moreover, students use both of these types of language (reasoning words and academic language organized by APT goal) to *position* themselves in discussion. That is, "I think" and "I agree/disagree" are identified as claiming/positioning words in my reasoning words tool. However, though not included in the reasoning words tool, academic language phrases like "Building on X's idea" can also be considered as language students use to position themselves. Thus, although Figure 10 revealed a relatively low increase in students' use of positioning/claiming words, considering students' utterance of academic language as presented in Figure 11 shows that there was a much greater increase overall in students' use of language to position themselves in discussion.

Second, the data in Figure 11 reveal that students used the explicitly taught language with greater frequency over time. That said, it is important to note that Figure 10 does not account for other variations of the explicitly taught language—that is, students sometimes used variations of the explicitly taught expressions, such as "I like what X said because" instead of "I agree with X's point because."

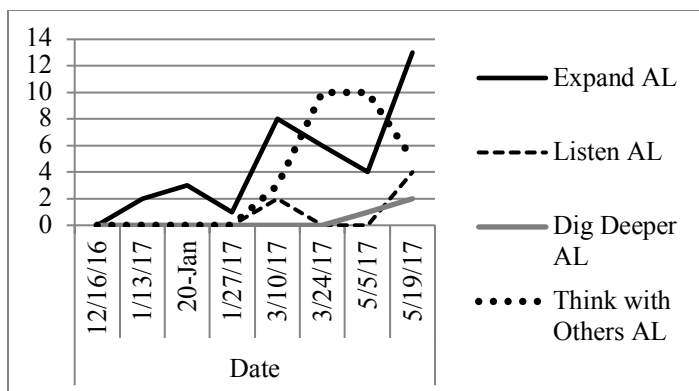


Figure 11. Students' use of explicitly taught academic language functions across the study.

Third, the data in Figure 11 are also important for understanding the relationship between the utterances of explicitly taught language by students and utterances of reasoning words by students. A Pearson correlation was conducted to assess the relationship between utterances of explicitly taught academic language (sentence stems) and utterances of reasoning words by students (see Table 17). There was a large and statistically significant positive correlation between the two variables, $r = .9452$, $n = 8$, $p = .00039$. Overall, this suggests that the scaffolding of these linguistic structures was possibly helpful in enacting students' engagement in the reasoning process because as students took on these language forms with greater frequency, they also verbalized their reasoning more.

Collaborative talk. In addition, I observed changes in the frequency with which students attempted to build on one another's ideas and construct knowledge with their peers. As I had done for the baseline transcripts, I coded students' explicit references (by name or pronoun) to other students' contributions in each discussion and calculated the

frequency of these references per 15-minute interval (see Collaborative Talk Tool, Table 8 in Chapter 3). In Chapter 4, I noted how on December 16 and January 13, there were no instances of students referring to one another's contributions by name or pronoun. However, as Figure 12 shows, this changed considerably on later dates. The data presented in Figure 12 show that discussions from Phase 1 began with zero instances of students explicitly referring to one another's ideas. These references gradually increased on January 20 and January 27, and finally increased dramatically from March 10 to May 19, which represent the time span during which all four APT goals and corresponding academic language were being implemented.

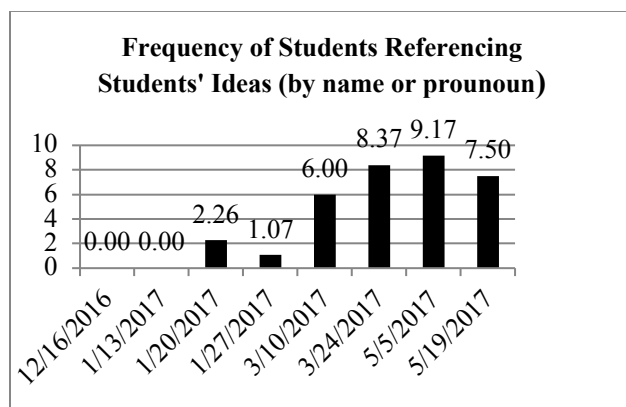


Figure 12. Frequency of students referencing students' ideas per 15 minutes.

Additionally, the data presented in Figure 12 is also important for understanding the possible relationship between incidences of students referencing students' ideas and utterances of reasoning words by students. A Pearson correlation was conducted to assess the relationship between incidences of students referencing students (by name or pronoun) and utterances of reasoning words by students (see Table 17). There was a

statistically significant positive correlation between the two variables ($r = 0.928$, $n = 8$, $p = .00083$). This suggests that as students engaged with their peers' ideas with greater frequency, they more often used reasoning words to express their own thinking.

Furthermore, I examined the possible influence of the four APT talk strategies on both instances of students referencing students' ideas and reasoning words uttered by students. A Pearson correlation was conducted to assess the relationship between the use of APT Goal 4 by teachers and utterances of reasoning words by students (see Table 17). There was a statistically significant positive correlation between the two variables, $r = .7989$, $n = 8$, $p = .01738$. Overall, this suggests that the frequent use of APT Goal 4 was important for fostering reasoning-based discourse. A Pearson correlation was also conducted to assess the relationship between the use of APT Goal 4 by teachers and incidences of students referencing students (see Table 17). There was also a statistically significant positive correlation between the two variables, $r = .8533$, $n = 8$, $p = .0071$. The result is significant, suggesting that the frequent use of APT Goal 4 was important for enacting collaborative talk.

Summary

In summary, the analysis of the quantitative data revealed several key trends. Teachers increasingly used particular APT moves (particularly, Expand and Thinking with Others) and implemented the integrated use of all four types of APT moves in the later parts of the study. In addition, there were shifts in student discourse over time. Students engaged in more talk during discussions; they contributed a greater percentage of the talk, and their turns of talk were longer. In addition, their engagement in reasoning

increased, as their use of reasoning words indicated, and they increasingly built on the ideas of their peers. Analysis suggested that they were engaging in analyzing and generalizing, as well as speculating and proposing. This increase seemed to be unconnected to the frequency of reasoning language in the texts used in class. Finally, students appeared to be using some of the explicitly taught language functions and structures (in particular, the language for sharing/expanding/elaborating and the language for thinking with others). Furthermore, the analysis of the pairwise correlations suggested that the quantity of reasoning words in the texts did not influence the quantity of reasoning words produced by students in discussions. In addition, both the scaffolding of functional language and the frequent use of APT Goal 4 appeared to be important for enacting and fostering both collaborative and reasoning-based discourse.

However, the analysis raised questions about exactly why and how talk strategies and the explicit teaching of academic language supported these shifts in student discourse in this particular classroom context. To gain a deeper understanding of the underlying reasons for the shifts in discourse revealed by the numerical data, I followed the quantitative investigation with a qualitative descriptive analysis of the transcripts, informed by both the quantitative results as well as other data from the study. I present this analysis in the following section.

Qualitative Analysis

To engage in this analysis, I drew on the quantitative data while simultaneously bolstering and deepening the analytic process through a closer examination and interpretation of the transcripts. In this section, I present the key findings of the

qualitative analysis. I organize the findings as four claims. For each claim, I substantiate the findings with examples from the discussion transcripts and other forms of data.

Claim 1: Use of APT Moves and Shifts in Talk

Teachers' explicit and frequent use of the moves appeared to be an important support for deepening student reasoning and promoting a rich, sustained collaborative exchange of ideas.

Over time, teachers used the APT moves regularly and consciously in ways that foregrounded the goals of students expressing their reasoning and engaging with their peers' thinking. I support Claim 1 by showing that when teachers began to systematically implement the talk moves, we saw talk shift. Moreover, this claim is bolstered by showing: (a) when we introduced particular moves, those goals became more salient for students; and (b) the integration of the four talk moves.

When examining the baseline transcripts in Chapter 4, it became evident that teachers used discussion to carry out a multitude of learning objectives, which were not always compatible with the overarching goal of supporting students' engagement in reasoning and in a dialogic exchange of ideas. Although teachers valued collaboration and reasoning in the early transcripts, they prioritized other competing goals, which called for an IRE-facilitated focus on "correct" answers. At times, these goals took precedence and necessitated an authoritative discourse to guide students' thinking during whole class discussions.

Although these competing goals did not simply disappear in the post-baseline discussion, teachers increasingly prioritized supporting students to extend and deepen

their thinking, listen actively to one another, and build on their peers' ideas to improve the shared knowledge in the classroom as the APT talk strategies were implemented in service of these goals. In the following discussion, I present examples of how explicit and frequent teacher prompting (with integrated use of the four talk strategies) extended individual students' reasoning and promoted student-student interchanges.

On January 27, which was an early post-baseline transcript, teachers consciously set out to implement two sets of talk strategies as part of the codesign: Expand and Listen moves. Teachers' language objectives for the discussion, as evidenced in their lesson plan and the teachers' statement of class objectives, included students stating their own views and exhibiting listening skills in a discussion context. Following an explicit statement to the students of the daily objectives and a vocabulary activity that previewed key words from the text, the teachers had the class read aloud and perform the Reader's Theater piece, "Should Everyone be Included?" The characters in this text share their perspectives on the inclusion of refugee students in their school community. After reading aloud, teachers gave students the opportunity to check their comprehension of the text with a partner using wh- questions (Who? Where? What happens? Why?) to analyze the text. The teachers then asked the students to discuss their perspectives on the issues presented in the text, specifically, their understanding of inclusion and exclusion and connections with the theme of citizenship.

Compared to early transcripts, teachers in these transcripts use Expand and Listen moves more frequently. This use appeared to result in students producing longer turns, perhaps because they were held accountable for explicating their thinking and

paraphrasing what their peers have said. This is shown in the following example from

January 27:

Line	Speaker: Discourse	Code
11	T: What are you learning about, from this example in the text, from the school, what are we learning about what happens when majority and minority groups get together?	
12	Amin: A debate happens. [crosstalk]	
13	T: So let's talk nice and loud.	
14	Dario: Sometimes the majority of the people usually, sometimes they try, <u>but</u> sometimes they feel that they can't do anything else, <u>because</u> the other kid doesn't know how to speak. [crosstalk].	
15	T: Who can tell us in their own words what, Dario said? (2 second pause) T: Can you say what you said again because some people didn't hear?	G2
16	Dario: The majority of the group usually tries, <u>but</u> when they feel like they can't do any better they just give up <u>because</u> they don't know how to speak English.	
17	T: So who can tell us what Dario just said in their own words?	G2
18	Sara: Most people, they don't think that, they don't think that they <u>would</u> fit in <u>because</u> they don't speak English <u>so</u> they just don't even bother.	
19	T: Dario, to be clear about 'they,' are you saying that the majority group don't speak English or the minority group?	
20	Dario: The minority --	
21	T: So, what are you learning about majority and minority groups? What happens to them?	
22	Ian: The majority are usually similar, and the minority. The minority and the majority are different than each other.	
23	T: Are there any words that you are learning today that could help you to express that? Ana?	
24	Ana: I thought of a word that--	
25	T: Ana, can you speak up? Please project your voice so we can all hear what you have to say.	
26	Victor: Yeah, Ana. <LAUGH>	
27	Ana: I, um, thought of a word that might be of good use for that, like they're not really, kind of 'isolated' from the group, kinda --	
28	T: So you're saying the Sudanese refugees are <i>isolated</i> from the larger group?	G1
29	Ana: Yeah, <u>because</u> they just kind of want to fit in, <u>but</u> they can't <u>because</u> they don't speak English.	

- 30 **T: Okay, so you're saying language is one of the barriers that causes this isolation.**
- 31 **T: Sargis, why don't you tell us more about Ana's idea?** G4
- 32 Sargis: Um, so like, um, the minority of the kids don't speak English, so they feel left out for everything in school, like recess and lunch and stuff like that.
- 33 **T: Can you add on to what Sargis has said?** G4
- 34 Victor: They probably, um like, hang out together during everything, like gym classes and like recess.
- 35 **T: So you're saying that even though there are these language barriers, you're saying that they still hang out with each other during recess?** G1
- 36 Victor: No, I mean with the other kids from Sudan.
- 37 **T: Okay, so you're saying the kids from Sudan socialize and keep each other company during lunch and recess. (2 second pause)** G1
- 38 Victor: Yeah, but I still think the other kids should try and talk to them and be friends with them, because they're never going to really learn.

As this episode shows, teachers use Expand and Listen/Repeat moves in lines 15, 17, 28, 35, and 37—that is, talk strategies that prompt students to clarify and expand on their ideas and facilitate active listening. This excerpt also demonstrates how these moves play out. In line 28, the teacher uses the “revoicing” move, in which the teacher paraphrases (with a slightly questioning tone) what the student said and then waits for the student’s affirmation or correction: “So you’re saying the Sudanese refugees are *isolated* from the larger group?” The student responds by providing more information to clarify her initial comment: “Yeah, because they just kind of want to fit in, but they can’t because they don’t speak English.” Instead of providing words such as “isolated” to be “correct” or because the teacher is eliciting that particular word as was evident in earlier transcripts, the student identifies a word that she deems is important and then explicates her reasoning for why that word is significant. Later in the same transcript, the teacher

uses revoicing again: “Okay, so you’re saying the kids from Sudan socialize and keep each other company during lunch and recess. (2 second pause).” The student responds: “Yeah, but I still think the other kids should try and talk to them and be friends with them, because they’re never going to really learn—.” In both instances, the teacher gives students the opportunity to extend their initial comments with further clarification and explanation. Moreover, not only do students say more (that is, they speak more words), but in both instances, students verbalize their reasoning as evident through their use of the words *because*, *but*, *I think*, and *should* following each instance of revoicing. Thus, it is evident that their response to the teacher involves extended reasoning.

In the same excerpt, we can also see examples of teachers using the Listen and Repeat moves to support active listening among students. In lines 15 to 18, the teacher asks, “Who can repeat what X just said?” to ensure that others are listening and that the student articulated her ideas in a way that her peers could understand. Following the Listening/Repeat talk strategy, students indicate with shrugs and blank stares that they either had not heard or understood the comment. The teacher asks Dario to repeat the initial comment. Dario proceeds to repeat and slightly revise his initial comment. This is evident because Dario changes the wording the second time, using words like “they can’t do any better” and “they give up” to convey that students in the majority group try to include students in the minority group, but give up when the language barrier is so pronounced. Then, the teacher asks again, “Who can tell what Dario just said in their own words?” This time, several students raise their hands, and Sara responds in line 18, reiterating Dario’s main point that the language barrier can make attempts of inclusion

challenging and even futile in schools' social settings. Once again, these exchanges show that students often would not listen to their peers' comments unless held accountable with the use of the Listen and Repeat moves (as indicated by their inability to restate what had been said), which in turn resulted in the student repeating and even expressing the initial idea with more precision than his or her initial comments so that other students could understand and repeat the idea. The teacher's explicit prompting not only results in more talk (as students literally have to repeat their own or another's ideas), but also sets the stage for collective thinking, as students are held accountable for listening to each other.

In general, we see a shift from the early transcripts in the way that the teachers are fostering authentic student-student interaction by holding students accountable for clarifying their view as well as listening and responding to the ideas of other— rather than having students provide “correct” responses that bear little relevance to what their peers have said before. Through the use of these moves, teachers provide the impetus for a discussion of sharing, allowing students to talk to one another.

Later in the same discussion, we can observe other instances of teachers integrating Expand and Listen/Repeat moves in a way that sets the stage for the upcoming Think with Others strategy. The teacher redirects the discussion by asking students to draw links to the overarching theme of citizenship in line 46:

Line	Speaker: Discourse from January 27	Code
46	T: Okay, so you've had a chance to make connections with these real life examples and now you have your theme of citizenship. Have you thought about what rights students might have, or what rights people might have, or what rules, or what responsibilities? Can somebody add something about the role of citizenship to the discussion?	
47	Ana: One of the responsibilities that people have is to make other	

- people from other countries feel welcome.
- 48 **T: Okay, someone we haven't heard from. Who can tell us in their own words what Ana just said. Someone who I haven't heard from today?** (2 second pause) G2
- 49 T: Do you need her to say it again? Go ahead and say it again.
- 50 Ana: One of the responsibilities that everyone has is that you have to make other people from other countries feel welcome here.
- 51 **T: Say what she said in a different way.** G2
- 52 Fatima: To make people feel [crosstalk] comfortable [crosstalk] because they are away from home.
- 53 **T: Can you add to that statement?** G4
- 54 Ian: I actually have a real life connection to add. There was a kid named Miles in my 4th grade class, and he couldn't talk so we had to find some way to communicate with him. It was sometimes harder, we had to use different ways other than talking, like hand signals, and we had to sometimes look at his face to see.
- 55 **T: Body language? What is that called? That's called non-verbal communication [crosstalk]. Okay, great life connection.**

In line 48, the teacher asks, “Who can tell us in their own words what Ana just said?”

Once again, students indicate that they did not hear or understand what Ana said with a prolonged silence, along with some shrugs, so the teacher asks if students “need her to say it again.” Ana repeats her comment, and another student paraphrases her comment.

Then, these exchanges create an ideal platform for the teacher to inject the next talk move (APT goal 4) in line 53 and for Ian build on his peers' ideas in line 54. We see that an important requisite for building on one another's ideas is to listen and understand first. These exchanges indicate that explicit prompting, aligned to the learning goals of the discussion, was needed to foster an environment of sharing and collective thinking in this classroom context.

In another example from the transcript, teachers use the “Say More” talk move to encourage students' explication of their ideas. In this case, the teachers had asked students to draw connections to the course theme of citizenship, and in line 60, the

teacher asks Aisha to “say more” about her comment, which suggested that it is a responsibility to ensure that members of minority groups who do not speak the majority language feel welcome in school settings.

Line	Speaker: Discourse from January 27	Code
58	T: So can you connect back to this theme? Was it your responsibility to make sure that someone communicated? Was it that person’s right to communicate? Was it a rule that everyone --	
59	Aisha: It was a responsibility.	
60	T: A responsibility? Whose? Tell me more.	G1
61	Aisha: We were responsible for, well it was his classmates’ responsibility <u>because</u> , no, actually, it was a right. I’m not sure <u>because</u> we didn’t have to, <u>but</u> we wanted to be his friend, and to be a good friend, we wanted to like find a way to communicate with him.	

In line 61, Aisha explicates her thinking and deepens his reasoning in a 48-word turn in which she also verbalizes her reasoning, as evidenced by words such as *because* and *but*.

As teachers took on Expand and Listen/Repeat moves, students were positioned as thinkers and listeners who expanded their reasoning abilities and understanding of the content by invoking an internal authority—rather than as participants in a hunt for the “correct” answer somewhere outside themselves. As students’ voices were brought to the forefront, they produced longer turns and exercised their reasoning skills orally. Moreover, teachers integrated Expand and Listen/Repeat moves strategically in order to promote extended thinking and active listening as well as accountability to peers in the classroom community.

In later transcripts, as teachers focused on Dig Deeper and Think with Others moves, these strategies translated into opportunities for students to deepen their reasoning

and engage in collective thinking. For example, in a later discussion on March 24, teachers consciously layer Dig Deeper and Think with Others moves, turning the focus to supporting students in deepening their reasoning and engaging in collective thinking. Once again, the findings suggest that teachers' frequent and explicit prompting supported students to practice deeper reasoning and engagement with their peers' ideas. To frame the discussion, the class read and performed a Reader's Theater piece ("Why Should I Care?"), which centers on a group of students who attend a class party to celebrate money raised for the Japanese Tsunami Fund. The characters in the text then proceed to share their perspectives on helping people in Japan after the earthquake. After reading and performing the Reader's Theater piece, students worked in small groups to characterize the various perspectives presented in the text and then, in a whole class discussion, shared their perspectives on whether they felt it is a moral obligation to help people in need, even when these people live far away.

In the following examples, explicit and frequent teacher prompting is needed to generate deeper individual reasoning and collective thinking. The teachers use Dig Deeper and Think with Others strategies to probe students' reasoning and support students in engaging with the ideas of their peers.

Line	Speaker: Discourse from March 24	Code
18	T: Who can add to what we just heard?	G4
19	Amin: About to what Ben just said?	
20	T: Either about what Ben said or what the question asks, which is do you think it's a moral obligation to help people in need even <u>if</u> they live far away?	CHK, G4
21	Amin: Like Ben, <u>I think</u> so. Not necessary go there in person. <u>Maybe</u> through a mail send money to help them a little bit <u>if</u> something happened to them.	PC (1) SP (2)

22	T: How'd you come to that conclusion? Why do you think that?	G3
23	Amin: <u>I think</u> it's nice.	PC (1)
24	T: Okay, does anyone want to add something to that? Ian.	G4
25	Ian: Someone did a fundraiser, like, all the money that they like get <u>should</u> go to the government, like the head of Japan <u>so</u> they can help rebuild. Just <u>because</u> we live half way across the world doesn't mean we <u>shouldn't</u> care. It will affect us in some way.	SP (2) AG (2)
26	T: Why do you think that?	G3
27	Ian: Debris off their beaches can come over here. We <u>should</u> help them, it can affect lots of sea life. We <u>should</u> send them money to help like, clean it up or send people over to help clean it up.	SP (2)

In lines 22 and 26, the teachers' explicit prompting with Dig Deeper moves results in students explicating their claims with reasons or evidence. In response to the prompting, students not only use *more* words, but they use *reasoning* words (positioning/claiming and speculating/proposing) to extend their thinking. In line 25, Ian reasons that it is a moral obligation to help others even if they live far away. When the teacher probes Ian's reasoning by asking, "Why do you think that?," Ian provides a much more reasoned answer, as he points out how the debris from such a disaster can impact the environment and "sea life," thus making it everyone's responsibility because this debris can eventually "come over here."

In addition, in this example, the teachers' integrated use of several APT talk strategies promotes deeper reasoning. For example, in line 24, the teacher invites others to build on Amin's initial idea. In line 25, although Ian does not explicitly refer to Amin by name or pronoun, he responds to the teacher's prompt to add to Amin's idea and

provides further reasoning as to why it is a moral obligation to help others even if they live far away, perhaps building on what Ian meant when he said it is “nice.” Then, the teacher further probes Ian’s reasoning with a Dig Deeper move: “Why do you think that?” In Line 27, Ian provides a much more reasoned answer, as he points out how the debris from such a disaster can impact the environment and “sea life,” thus making it a everyone’s moral responsibility. In this exchange, the teacher switches from probing individual reasoning to generating collective thinking, and these processes amplify each other, resulting in deeper individual and collective thinking.

Later in the same transcript, the teacher’s use of a Think with Others talk move (“Okay who can add to that point?”) results in students explicitly referring to each other’s ideas. In line 76, the teacher asks, “Who can add to what he just said?” In response, students refer to the ideas of their peers by name or pronoun in three of the ensuing turns (lines 77, 79, and 83), showing that they build on each other’s ideas:

Line	Speaker: Discourse from March 24	Code
74	T: Okay so, we should help because we all have relatives from other parts of the world?	G1
75	Victor: It doesn’t just benefit us, it doesn’t just benefit them. It benefits us as people. It makes us better people.	
76	T: Okay who can add to what he just said, okay.	G4
77	Dario: <u>I think what he’s trying to say</u> is that people can have family members from everywhere. If something bad happens there, you don’t go there just to help them but you go there to help everyone else.	SRS
78	Max: Not, <u>I kind of agree with Victor</u> , but not just with somebody that's a family member, like relatives with you. Not long ago a fireman died in Watertown.	SRS
79	T: Yep.	
80	Max: A lot of people went there that probably didn’t even know who he was. That shows respect. That doesn’t just show respect because he was in our town, but that means you	

should.

81 **T: So it might not be your cousin or your uncle who was that fireman, right? It's out of respect for all the people in our community, and a lot of people felt a loss.**

82 Ben: I would like to add to Max. Wasn't that a few days ago the fireman died? SRS

83 **T: Does anybody know?**

84 Ben: Once there was a fire fighter that died in 2013'ish and then they had a big parade for him in Watertown. A person put up a sign that said RIP. At the school they put the flags half-mast.

This pattern reoccurs in other examples from this transcript. That is, when teachers explicitly used Think with Others moves, students referred to each other's ideas with more frequency. Such examples of students referring to their peers' ideas begin to appear as soon as teachers implement the Think with Others moves on February 10, as in the following example from this date:

Line	Speaker: Discourse from February 10	Code
81	T: So anybody want to agree or disagree with what Aisha just said?	G4
82	Claire: Just, thumbs up.	
83	Ian: <u>I want to add something onto earlier with what Ana said.</u> When people get isolated it kind of changes the community a lot. When it's just one person it doesn't make a huge change in the community but it does for them. If you're not the one that isolated, everything feels normal for you, but then they have a hard time getting something to do. When it's a bigger group that's isolated, then it's not that big of a problem because at least they have other people in the group that get isolated and then they have something in common and they both know how it is. They can work together to try stopping that.	SRS
84	T: It makes me think of a lot of this talk about individual community and, so you're saying individual isolation is different from is a whole group is isolated because at least the group has each other, so it's less isolating. Okay, does anyone want to add to either what Aisha or Ian said?	G4
85	Ana: <u>This is adding onto what Ian just said.</u> Maybe the	SRS

group could try and prevent other people being excluded from that other group, um yeah.

In this passage, the use of Think with Others talk strategies twice in lines 81 and 84 results in students explicitly referring to their peers' ideas.

In sum, these findings suggest that explicit and frequent prompting by the teacher allowed students to extend their thinking, listen to others, deepen individual reasoning, and engage in collective reasoning in this classroom context. In addition, when teachers purposefully shifted and navigated all four types of strategies, they fostered an environment with a rich and communal exchange of ideas.

Claim 2: Collective Reasoning Supports Individual Reasoning

Collective reasoning supported individual reasoning and thinking; that is to say that as more collective reasoning occurred, individuals also engaged in and verbalized their reasoning more.

As the quantitative data (see Figures 4, 8, 9) indicated, the days when teachers used Think with Others talk strategies (March 10, March 24, May 5, and May 19) most frequently were also the days when students explicitly referred to each other by name or pronoun with the highest frequency (March 10 = 6 Total SRS; March 24 = 8 Total SRS; May 5 = 9 Total SRS; May 19 = 8 Total SRS). In addition, students produced the highest frequency of reasoning words per day on those days (52 reasoning words on March 10, 60 reasoning words on March 24, 66 reasoning words on May 5, and 86 reasoning words on May 19). This pattern suggests two things. First, the data provide further support for Claim 1—that is, explicit and frequent teacher prompting was needed to generate

collective reasoning in this classroom. The second, however, is a new claim: Students were more likely to explicate and verbalize reasoning in discussion settings when multiple perspectives were seeded into the discussion and students were encouraged to attend and respond to their peers' thinking.

In the following transcript excerpt from March 10, students engage in a whole class discussion on the poem, "I, Too, Sing America," by Langston Hughes. The teacher asks students to explain the significance of the poem's title, while also drawing a connection to the theme of citizenship. The class reads the poem aloud twice, and the teachers explain the meanings of unfamiliar words from the text (e.g., oppressed, prejudiced). The teachers give students time to discuss the poem in pairs and give them comprehension questions before the large group discussion.

Closer analysis of this excerpt demonstrates that the teachers' use of talk strategies fosters a communal exchange of ideas by allowing multiple perspectives to germinate in the discussion, supported by students verbalizing their own reasoning:

Line	Speaker: Discourse from March 10	Code
103	T: It's interesting how the poet repeats two phrases, "I, too, sing America. I, too, am America." And that links to what we've been talking about citizenship, rules, rights and responsibilities. What exactly does the author mean by this phrase? Why is it repeated? How does it link with our theme? "I, too, am America."	
104	Fatima: <u>I think</u> it means that ...	PC (1)
105	T: Can you speak up?	
106	Fatima: <u>I think</u> it means that other people, like, are the same	PC (1)
107	T: Who can add to that, okay we haven't heard from you Sargis, tell us how is this related "I, too, sing America, I am America?"	G4
108	Sargis: He's probably says when I say "I, too am America" he is	SP (1) AG (1)

- American, so they should treat him equally.
- 109 Dario: I think he's trying to say, he is American, so why can't he get treated like everybody else? PC (1)
AG (1)
- 110 Victor: I was going to say that.
- 111 T: **Can you just build on what Dario said then?** G4
- 112 Victor: America wouldn't be a country without people, so he's also part of America, he deserves to be treated just as everybody else is, because without its people, America would just be a name, it wouldn't be an actual country. SP (3)
AG (2)
- 113 TZ: **Right, so he's saying, I have the right to feel patriotic, I'm just as American as anybody else, is that right?**
- 114 Ian: I want to add on to what Dario said and Victor that we're all from America, we're all people no matter where we're from, if we're in America, we should all be treated the same. We should all get equal rights and if we're in America, no one should be treated differently. We're all people. SRS (2)
SP (4)
- 115 T: **Okay, so that's a great connection to our theme, would you like to add to what Ian said?** G4
- 116 Dario: I would like to add on to Ian. It's not fair that if you're American, and if other people, and you don't get treated the same way, because you guys are both the same there's no differences between you. SRS
SP (2)
AG (1)
- 117 T: **Final comment to add, Amin?** G4
- 118 Amin: Because, maybe if he's not American, but maybe he's African American, or maybe he's Indian, or another person. *But* he can still be an American, and he can be talking like he's not an American, but he can still be an American citizen, he's just from a different country. Other people use him as a slave but he is still American, but other people might not know. SP (6)
AG (6)
- 119 T: **Okay, so you're going back to last week, we said the only true Americans are Native Americans. Everybody's from somewhere else.**
- 120 Dario: I'd like to add onto Amin. If someone is from another place, they can still be American but they don't have the right to treat them a different way. SRS
SP (2)
AG (1)

It is important to note that this text (in comparison to any other text read and discussed for Discussion Fridays) had the least reasoning words (1 word); nevertheless, the student discourse uses 52 reasoning words (see Table 15), and students explicitly refer to each other by name or pronoun four times. In this excerpt, when teachers prompt

students to build on each other’s ideas (lines 107, 111, 115, and 117), not only do the students attend to the ideas of others, but their discourse indicates that reasoning is at work based on their utterance of positioning, speculating/proposing, and analyzing/generalizing reasoning words. This is evident in lines 108, 112, 114, 116, and 118. Although students are mostly agreeing with and building on each other’s ideas (or even repeating similar ideas in a slightly different ways), rather than arguing or debating, it is this process of seeding multiple takes into the discussion that gets students to exercise their reasoning. It appears as if the ideas being aired out by their peers resonate with students who are listening, and in turn this activates a chain reaction of responses and collective reasoning.

In the following example, students have read aloud an article “The Solar Powered Plane” by Cameron Keady and watched a short clip on the Solar Impulse, the first solar airplane to fly during the night between continents. Following a vocabulary task on key words from the text (e.g., clean energy, clean technology, efficiency) and a comprehension task with guiding questions that students completed in small groups, students discussed the texts, with teachers asking them to draw connections to the main theme. In this example, a variety of ideas, differing views, and student inquiries result in students expressing and deepening their reasoning:

Line	Speaker: Discourse from March 31	Code
1	T: What's your impression of the plane? Amin said he thought it was big. Amin tell us more about that. I think-	G1
2	Amin: I think the plane was big by size because the wings, are they called wings?	
3	T: Mm-hmm.	
4	Amin: The wings were completely made out of solar panels. That’s what interests me.	

- 5 **T: Could somebody use one of your cards to either build on his idea or if somebody thinks differently? Use your card, Ian.** G4
- 6 Ian: However, to what Amin said, the plane was small because if it was big, the engine would need more energy to run, so they had to design it small, so the less solar power.

In this excerpt, Ian disagrees with Amin's statement and goes on to justify and reason as to why the solar plane is, in fact, small. However, we see that it is the juxtaposition of this difference put out by two peers that triggers Ian to explain his reasoning. In the next example from the same transcript, students' questions and or statements trigger others to respond in a reasoned way.

Line	Speaker: Discourse from March 31	Code
16	Sargis: I was just about to say, how did it fly at night <u>if</u> the sun wasn't shining?	
17	T: Who can find in the text where it says so? Let's point it out in the text. Sargis's question is how can it fly at night time if there's no sun? Sara, tell everybody.	
18	Sara: <u>Cuz</u> it says, um, in the plane power section, it says by day the solar panels are charged by the sun to power lithium batteries that enables the plane to fly at night.	AG (1)
19	T: Does that answer your question? Yeah. Anybody else have anything they want to share about what their impression of this plane was? Yes.	
20	Max: Pretty cool.	
21	T: Tell us more, what makes it pretty cool?	G1
22	Max: It says it's almost as heavy as a van in the video. Usually planes aren't like that, that light. They're usually a lot heavier.	
23	T: Okay, can anyone explain what Max means?	G4
24	Amin: <u>I want to add to Max</u> because <u>I agree</u> with you <u>because</u> the plane was only two tons <u>but</u> regular day planes are 63. They're very heavy <u>but</u> I'm wondering how, I know it had propellers <u>but</u> I'm wondering how, I'm wondering how the solar panels don't burn up from the heat, that's what I'm wondering.	AG (4) PC (1)
25	Ana: Well, it's not that hot.	
26	T: Maybe you could use your card and talk about that.	
27	Ana: <u>I have a different point of view.</u>	

- 28 **T: Let's listen up, excuse me you guys need to stop doing that. Okay and so what is your point of view?**
- 29 Ana: The solar panels aren't so high that they could burn. AG (1)
They're high to get energy but they're not that high.
- 30 **T: Okay does anybody want to add on to that or clarify what Ana means?** G4
- 31 Ian: Yeah I want to clarify. It is pretty high but it's not that, the temperature isn't that much different down here on Earth on the ground. It might just be like ten or 15 degrees difference - AG (1)
SP (1)

In lines 16 and 24, two students (not the teacher) raise reasonable questions about the content of the text. In response to the first question, Sara draws from the text to justify her answer; in response to the second question, Ana reasons as to why solar panels do not just “burn up” in the sky. Then, in line 22, Max is intrigued by the fact that solar planes are so “light,” and Amin builds on this point by providing textual evidence. Not only do students draw on textual evidence to deepen their reasoning in response to their peers’ inquiries, but also in lines 18, 24, 29, and 31, students use analyzing/generalizing words (*but, because, cuz*) to develop their reasoning.

We can find additional examples of this dynamic in the transcript from May 19. For this discussion, the class has read aloud the Reader’s Theater piece from the Word Generation Unit 5.10, “Do We Need Laws to Regulate Our Behavior?” The text introduces the idea of a cell phone ban at school, and students follow up with a discussion on whether or not it is justified to ban cell phones from a school building because some kids misuse them. To prepare for the discussion, students first talk in groups about digital citizenship in general. They discuss topics like screen time rules in their homes, as well as their thoughts on social media use (e.g., how much time they spend on social media).

Line	Speaker: Discourse from May 19	Code
8	Victor: <u>To put it differently from Aisha</u> , while, um, phones <u>could be</u> a distraction in class, a few of my friends in middle school told me that like the teachers have a phone bin where you go to put your phone and <u>I mean maybe</u> a kid will say, “I don’t have a phone,” <u>but</u> then once like <u>if</u> you see them using their phone then you already know <u>if</u> they have a phone or not. You just take it away and then previous classes you can say, ‘I know you have a phone so just hand it over.’ So, yeah.	SRS (1) SP (4) AG (1)
9	T: So you think that’s a good rule, for teachers to have a bin?	G1
10	Victor: Not to like ban...	
11	T: Not to ban them completely but just to have a bin. Okay, who has an opposing point of view from Victor?	G4
12	Ana: <u>I think</u> , <u>if</u> you have a phone bin, then it <u>would</u> kind of <u>be</u> telling the students, Oh, I don’t trust you do not have your phone out <u>so</u> I just won’t trust you. <u>I think</u> that just kind of sends a bad vibe to them.	SP (2) AG (1) PC (2)
13	T: Could you tell us more about that idea of trust?	G1
14	Ana: You <u>should</u> trust your students. And <u>if</u> you see them with their phone then you <u>could</u> just <u>be</u> like, “Turn it off,” or	SP (3)
15	T: Okay, so it breaks down the trust you’re saying?	G1
16	Ana: Yeah.	
17	T: So it’s not a good idea. Does anyone else want to add to that? You have your hand up.	G4
18	Sargis: <u>Building on to Ana’s and Victor’s idea</u> . So, they <u>shouldn’t</u> ban them from schools <u>but</u> they <u>shouldn’t</u> like use them in class. Like, <u>if</u> you want to talk to someone you <u>should</u> just go like to your locker and then, talk to your mom or text someone, <u>so</u> you won’t get in trouble and it will like, it will help you.	SRS (2) SP (4) AG (2)
19	T: So are you saying that if students are responsible then there’s no need to ban them?	G1
20	Sargis: Yeah.	

This example shows how the emergence of multiple ideas in a discussion, coupled with teachers’ attempts to juxtapose ideas and encourage students to attend to one another’s ideas, results in student discourse in which reasoning is clearly at work. In line 8, Victor

responds to and builds on an idea put forth by Aisha that phones in classrooms can be a distraction to learning. Victor introduces the example of a teacher who keeps a “phone bin” in the classroom to address this issue. In line 12, Ana explains why she disagrees with teachers using phone bins to regulate phone use. Then, in line 18, Sargis “builds on both Ana’s and Victor’s idea” and adds a new reason that phones should not be banned. The teachers use Think with Others moves, but they also purposefully use Expand moves to support the process of seeding multiple perspectives into the discussion. Sometimes, it was necessary for the teachers to draw more information out from the students before others could respond to an idea in this classroom context. This also speaks to the purposeful use of integrated moves and APT goals in order to foster collective thinking.

In comparing the above transcript to the baseline transcripts, it becomes clear that when teachers provided opportunities for discussion in which students’ ideas were elicited but not examined or set in relation to one another for further analysis, then opportunities for engaging in reasoning-based discourse diminished greatly. Even when students’ ideas were solicited in rapid succession with few attempts to juxtapose these ideas with those of other students, it restricted students’ chance to express their reasoning.

For example, in the baseline transcript from December 16, even though teachers use Dig Deeper talk strategies with frequency (specifically the Asking for Evidence move), use of the move alone did not necessarily foster a learning community in which students provided evidence and verbalized their reasoning as seen in the example from the baseline transcript, where students give one-word responses and/or read verbatim

from the text to locate evidence, without explicating or verbalizing their reasoning.

Aside from retrieving evidence from the text, students did not verbalize their original reasoning.

- 49 **T: Okay. Does anybody else have another piece down from Stavros?**
50 Ian: Yes. Teams are never fair, so he doesn't want to play the game.
51 **T: What number is that?**
52 Ian: uh, fourteen.
53 **T: Line number 14 there. He says, "I don't want to"...?**
54 Ian: Play.
55 **T: "I don't want to play." {T repeats line from the text.} So, you could find a piece of evidence, which is pretty straight-, you know which is clear. Then, what's Tomoko's perspective? Sara, what's Tomoko's perspective?**
56 Sara: In the Japanese school it's everyone's responsibility.
57 **T: Okay, and what line number did you find it from?**
58 Sara: um, twelve.
59 **T: 12, and what does Tomoko say?**
60 Sara: "In Japan teachers would say that we had to solve our problems together, and if two of us were fighting, everyone would be expected to participate in first figuring out what happened."

This example suggests that teaching students to support claims with both evidence and reasoning, without having students attend to each other's ideas, results in a singular answer or an individual judgment rather than a collective judgment based on the relevant stock of reasons brought to the table. In the case of individual reasoning, opportunities for students to synthesize multiple ideas and to deepen reasoning through cooperation or conflict are diminished.

In the transcript from January 13, even when students' ideas are solicited (lines 65, 67, 69, and 71), students are not asked to elaborate or respond to others' ideas, resulting in more of a "popcorn" pattern of participation. Although student discourse exhibits some reasoning, in general, these linguistic markers were much less frequent

than when teachers generated opportunities for dialogic exchanges in the classroom through the purposeful use of discursive strategies.

- Line Speaker: Discourse
- 64 **T: Yes, tell everybody what you're learning about justice?**
- 65 Ana: I think, justice is, a, um burden.
- 66 **T: What else are you learning? Why are you having this holiday on Monday? Max, what do you think?**
- 67 Max: Because he kind of stood up for himself when other people wouldn't want to do that. They were scared, but, he, yeah, he had the courage to do the right things, and make the world a better place.
- 68 **T: Amin.**
- 69 Amin: The story about the bus going, like, everywhere. Rosa Parks, when she was on the bus, she had to be taken out from the bus, because she was sitting in places where white people usually sit. She had to get off the bus or sit in back, and she refused. Then Rosa Parks and Martin Luther King met and then they were friends.
- 70 **T: Is there anything from this reading that you're going to take away that maybe why we have a holiday for Martin Luther King? From this reading. Ana talked about justice. Max talked about one person having...?**
- 71 Max: Equal rights.
- 72 **T: Well, no, Martin Luther King, you said, was someone who had...?**
- 73 Max: Oh, he had the courage.
- 74 **T: Courage. Ian.**

In sum, the data show that not only was it important to increase the exposure of multiple students' ideas in general, but it was also necessary for teachers to use moves that led students to consider and react to others' ideas to promote both individual and collaborative reasoning in this classroom. It appeared that students' ideas become more cogent and reasoned the more responsive they are to what others have said.

Claim 3: Multiple Opportunities to Practice Language in Context Supports

Engagement with Academic Language and Registers

In addition to teachers explicitly teaching, modeling, and scaffolding academic language, providing students with multiple opportunities to practice applying these linguistic functions and structures in meaningful ways supported students in owning and utilizing these specialized language functions. Over time, not only did students use these expressions with more frequency, but they also developed their own ways of expressing the moves and language functions.

Quantitative analysis of the baseline/early transcripts (see Figure 10) showed that although students had already had some exposure and explicit instruction in the functions and structures of academic language for engaging in dialogic discourse, they were not yet producing this specialized language in their discourse at that time. However, over time, students used these expressions with frequency and also developed their own ways of expressing these language functions. To substantiate this claim, in the following paragraphs I show how students' use of the academic language shifted over time, using three examples of transcript from early, late, and middle stages in the study.

In the quantitative analysis of the baseline transcripts, I reported that there was no evidence of students incorporating these particular facets of language into their contributions to whole class discussions. As I reported in the first baseline transcript (December 16), students simply called out words without using language to *frame* their ideas in relation to others or to link ideas. My analysis suggested that this occurred because the teacher was guiding the discussion in a particular direction to make an

instructional point. Thus, students did not have the opportunities to use these linguistic expressions to express their complex thinking in an authentic discussion context. Moreover, it may have been too early for students to have internalized and to produce regularly the language functions with the little practice and exposure they had at that time.

Before the next baseline transcript, on January 6, teachers offered some explicit instruction of these forms as evidenced in the recorded class sessions. On January 6, teachers explained the purpose of Discussion Fridays—to think critically about the theme of citizenship through weekly discussion topics related to citizenship. Teachers also introduced key language for engaging in academic discussions that they expected students to use in these weekly Friday classes: “In your group discussion, what you want to try and do, what we’d like to have you do is try to build on other people’s ideas. So when you build on people’s ideas, you try to find the things that you agree with. You might say, for example, I agree with _____. I think that . . . Or you might say, my idea is similar to _____’s idea.”

Even though students had had some exposure to and explicit instruction on how and when to use key academic words and phrases for expressing a view or for drawing a connection to a peer’s idea, in the very next week, students still did not produce the language forms in discussion, as the following example from January 13 shows:

- Line Speaker: Discourse from January 13
- 16 **T: In that title, “The Quest for Peace and Justice,” What is this quest for?**
Ben: He wants a quest for peace and justice, for all black people.
- 17 **T: So, when you look at your paper, you can think about this, in the top**
- 18 **section, what do you see here? Yeah.**
Layla: A building, a rocket ship, a bridge, and an airplane.

- 19 **T: What do we call *these*?**
20 Layla: Things
21 **T: These are things, What don't you see in this picture?**
22 Ian: Humans.
23 **T: You don't see any people. On the other side, what do you see here?**
24 Layla: Humans.
25 **T: What are these humans asking for? What are they asking for, Dario, in**
26 **the pictures, Dario? What are the people asking for in the pictures? Can**
you read what it says?
Dario: "March in Washington for jobs and freedom."
27 **T: What else?**
28 Dario: Equal rights.
29 **T: Are people asking for airplanes, bridges, and spaceships? No. What**
30 **are they asking for?**
Sargis: Equal rights.
31 Dario: Jobs.
32 **T: Jobs, food, and...? (2 second pause)**
33 Amin: Equal rights.

The findings suggest that the reasons for this are twofold. In the above examples, perhaps students had not had enough opportunities to practice using the language in focus. Moreover, teachers' limited use of strategies to support extended discourse, active listening, and collective thinking, coupled with learning objectives that called for a more authoritative discourse, might not have shaped opportunities for students to use the functions of this language. In sum, although students had had some instruction in this specialized academic language, one lesson's explicit instruction was simply not enough.

The following excerpt from the February 3 transcript (still, one of the earlier post-baseline transcripts), is an example of an early conversation that led to the need to add more academic language scaffolds as students were not yet producing the language. Students had watched an interview with American football punter Greg Coleman and were asked to discuss how Greg Coleman's success story relates to the theme of citizenship and the focus word, *perseverance*. In this excerpt, teachers practice

incorporating the four types of talk strategies. The transcripts reveal that even though the use of talk strategies results in more reasoned, dialogic discourse, students are not yet producing the specialized academic language for framing their comments in discussion, except for “I think,” which appears in line 58.

Line	Speaker: Discourse from February 3	Code
47	T: Was there any evidence about how he felt from the video? you have any evidence from the video about how he felt?	CHK, G3
48	Amin: What was the question?	
49	T: Was there any evidence from the video about how he felt?	CHK, G3
50	Amin: At the end he was crying.	
51	T: So what does that suggest to you?	G1
52	Fatima: That it was, um he was upset about it, and he didn't like that.	
53	T: So can somebody build on that idea of how does that, what does that tell you about things that happen to the people in the past, how does that affect them in the present? Ana.	G4
54	Ana: Maybe when he thought about what had happened back then, he, um, started to cry, because he was um, because it was really unfair.	SP (1) AG (2)
55	T: Okay, so that's interesting. So you're say he was crying, because it was unfair. Can you tell me a little bit more?	G1
56	Max: Because (2 second pause)	
57	T: So, it's a painful memory. He was crying, because black people couldn't play and that brought him sadness and pain.	
58	Max: And I thought maybe it's because of him thinking, if they wouldn't want, he wouldn't want that to happen to anyone else.	SP (3) AG (1) PC (1)
59	T: Okay, so he wouldn't want that to happen to anyone else.	
60	T: So, how do that relate to your idea of citizenship?	
61	Max: Because if you want to be a good citizen, part of that is being nice or caring about other people.	SP (1) AG (1)
62	T: Okay, who can repeat in their own words what Max said? Yeah.	G2
63	Victor: To be a good citizen, you need to treat individuals the rules the right way.	

and self-assessments for the purpose of encouraging students to assess and improve on their language register in class discussions.

Over time, as students had more opportunities to engage in “Academically Productive Talk” and to incorporate the supports into their discussions, not only did the language shift, but so too did the cohesiveness of the discussion. The transcripts from March 24 reveal shifts in how students are using this specialized language:

Line	Speaker: Discourse from March 24	Code
30	T: Can anyone add on to what Ian said? Dario, you had your hand up.	G4
31	Dario: <u>I'd like to add on what Ian said.</u>	
32	T: Yes, don't forget to use your cards.	
33	Dario: <u>In addition to what Ian said</u> , just 'cause like you're far away from what the tsunami doesn't mean you can't go there and help. If it happens to you, other people would probably help you, so why won't you help them?	
34	T: That's a different reason from Ian's, you're adding to what he said. One was we're all interconnected. If we don't help, the problem might spread to our shores. You're saying we should help because if we help, when we're in trouble people will help us?	G1
35	Dario: Yes.	
36	T: Okay who came up with other reasons of why we should or shouldn't help people if they live far away.	
37	Sara: <u>I think</u> you don't really have to do something that you don't want to. Even though it would be better if you did, it's not like a mandatory thing.	
38	T: So, it's not a must?	G1
39	Sara: Yeah it's not a must but it would be better if you did.	
40	T: Why do you think that?--	G3
41	Ana: <u>I'd like to add onto one of the others --</u>	
42	T: Okay but let's hear Sara, why do you think that? Why would it be better if you did?	G3
43	Sara: Cuz then you're showing that you care. You're just raising money or whatever you want to do to help.	
44	T: Okay, someone we haven't heard from?	

- 45 Ana: I just wanted to agree with Sara. You're not obligated to do it.
It's a nice thing to do, you should do it but you don't have to.
- 46 **T: Could you give an example?** G1
- 47 Ana: If there's like, I don't know.
- 48 Ben: I'd like to add on to Sara's. Um, well, like you should do things for like other countries when they go through hard times. Canada, they sent notes to kids during 2001 and said, "Sorry for the attack that happened on your city. I hope nobody of your family got hurt in the towers" and stuff like that.

In lines 30, 45, and 48, students use language to name the person whose idea they are building on and then to frame their comments as a response to something that person has said. Moreover, they explicitly point out that they are elaborating or building on (rather countering or giving an example of) what someone else has said. In using language to reference other's ideas and to frame one's own, students are in fact using metacommentary which indirectly helps other listeners grasp and contribute to previously stated ideas, which also promotes effective conversation and collaborative reasoning. Moreover, we see that students are gaining ownership of this type of language and using it with more frequency.

In later discussions, students increasingly use the explicitly taught academic language but also use it more flexibly. The following examples were drawn from whole class discussions on April 28, May 5, and May 19. At this point, students had received much exposure to and practice with the specialized language for discussions. Moreover, from this point on, each student participant was provided with an academic language cheat sheet containing all of the language functions and corresponding academic language (see Appendix D, Student Cheat Sheet: Academic Language Functions) that they had been explicitly taught and had practiced over the course of the study, as well as

the different types of discussion contributions that they could make. Students were encouraged to review the cheat sheet prior to the discussion and then to use the cheat sheet as a reference (which was placed on each student’s desk) during discussion. The following example, from April 28, shows how students used the sentence starters in focus to share their ideas with greater frequency in comparison to both early and middle transcripts.

Line	Speaker: Discourse from April 28	Code
33	Aisha: <u>In other words</u> , so <u>like what was Layla saying</u> , that, that it’s not their fault that the place they live in, the water is sparse. Scarce. And they have to pay the price and it’s not fair.	SRS
34	T: So you said the word “rights.” But I wanted to know how you're going to use the word “rights?”	CHK G1
35	Aisha: Oh. They have the right to have clean water.	
36	T: Who can explain in their own words what Aisha means because this is really important point.	G2
37	Amin: <u>This is how I understood what Aisha just said -</u>	SRS
38	T: Excellent, great.	
39	Amin: First thing first, this /understood/ is actually spelled wrong.	
40	Victor: Actually, that’s how you spell it.	
41	T: Yeah, that’s how you spell it. It’s that double “OO” spelling but a short double ‘OO’ sound. /Understood/.	
42	Amin: <u>This is how I /understood/ what Aisha said--</u>	
43	T: /Understood/ {T corrects pronunciation}	
44	Amin: Um, /understood/ what Aisha said. People have the rights to get clean drinking water but they have to go through a lot of hard work to do it but at the end they can get some. But they have to keep on doing it again and again.	AG (3)
45	T: Does that make it right though? How come some people have to go through a lot of hard work to have drinking water?	
46	Dario: And other people don’t.	
47	T: And other people don't, and what does that say about rights? Do you want to add something to what you just said?	G1
48	Dario: Yeah if you have clean or good quality water and someone else that you know doesn’t you should still try to get	SP (2) AG (1)

- water because that will help them.
- 49 Ian: I agree with Amin and Dario but I'd like to add something else because then it takes them a long time to get water. They have to walk about a mile and we all we have to do is just turn on the faucet. It makes me wonder. . . (2 second pause) SRS (2)
AG (2)
PC (1)
- 50 T: It makes you wonder what?
- 51 Ian: How it would be to have to do that every day just to get water. SP (1)

The transcript shows that students use the language more frequently as evident in lines 33, 37, and 49, perhaps because of the additional supports and opportunities to practice they received in each class. The Academic Language cheat sheet developed for this project was a tool for students to use which provided sentence starters (linguistic examples) for the various types of contributions students can make in a discussion. EL and English proficient students kept the cheat sheets on their desks, and referred often to them throughout this April 28 discussion. In addition, students begin to use variations of the language that was taught when they want to get their point across and do not refer to the cheat sheet to match the exact word. Such variations in wording include “to what X said” and “like what X was saying” on April 28 and “so it seemed to me” in the May 5 transcript. Other examples of variations of academic language produced during the study include “I’m trying to clarify,” “I mean,” “I like X’s idea,” “I don’t know what he said,” and “I just can’t put it in my own words.” The following example is from May 5:

- Line Speaker: Discourse from May 5
- 71 **T: Okay, so that’s an example of a stereotype. Oh, all boys are so fidgety. Hey, wait. Maybe I’m a boy, I’m not fidgety. So you’re saying that’s a stereotype. Okay, Ana**
- Ana: So [crosstalk]. Quiet please.
- 72 Ana: Wait, what was I going to say? Yeah, I lost my train of thought.
- 73 Ana: Um, oh yeah, **so it seemed to me** that like, I kind of thought that um, boys needed to be more hands on, and girls don’t really need that, but I know for

- myself, I do need hands on. Just like, just helps me to understand better.
- 74 **T: Okay, so you're a hands-on learner. Maybe you're a girl and you're fidgety, so what if you're put in an all girls school, and you have the fidgets? You might not fit into that context. Okay, good point. Does anyone want to add to that? Yes, Sargis.**
- 75 Sargis: Adding to what Amin said.
- 76 **T: Okay.**
- 77 Sargis: So, I agree with Amin, that like for example, it's an all boys school, and like the other boys need a fidget or something to help them focus. Maybe not one specific boy might not need it. Maybe he doesn't need anything.
- 78 **T: Okay, so single gender schools may lead to stereotyping.**
- 79 Ian: I actually agree with Ana. Some boys need to fidget, and also some girls need to. Some boys don't even need to fidget, because they're focused on it.
- 80 **T: Okay, so what's a vocabulary word that we learned?**
- 81 Ian: Not all boys need to fidget.
- 82 **T: Right, so it's a "stereotype," if we say all boys are fidgety.**
- 83 Ian: And girls also need to fidget, so, in general most people need to have, some people have to fidget, some people don't.
- 84 **T: Yeah, I'm a fidgeter. <LAUGH>**
- 85 Sara: I agree with what Ana and Ian said. Like, not just boys need to fidget. I personally, I like to do interactive things with learning, and that helps me learn better.

In sum, as the interaction patterns shifted over the course of the study toward a more dialogic exchange of ideas and as students had more opportunities to use academic language to frame their comments in discussions, the transcripts revealed a shift in students' production of these explicitly taught language items (as well as variations of the explicitly taught language). Moreover, not only was there a shift in register and in how often students used specialized language to participate in discussion, but students also began developing their own ways of expressing these language functions, suggesting that they may have been driven more by the content and the communicative purpose of what they were saying than by the rote uses of the language in focus. In addition, over time dialogue also became more explicit, contextualized, interconnected, and cohesive and

less like a series of discrete, disconnected monologues. Therefore, the increase in use of this specialized language also seems to support that initial goal of promoting reasoning-focused, dialogic discourse.

Claim 4: Increased Opportunities Engaged in APT and Practice with Academic Language Functions Fosters Student Autonomy Over Time

As students became more accustomed to being held accountable for sharing their reasoning and for listening to and building on their peers' ideas, they also engaged in a dialogue without always being prompted to do so. This shift in talk may be attributed to increased exposure to and practice with academic language functions or to increased opportunities engaged in "Academically Productive Talk," or to both, as it was difficult to tease apart which of the two scaffolds supported this shift in talk.

To support this claim, I use examples from later transcripts (March 31, April 28, May 5, and May 19) to show how students' independence as participants in productive discourse appeared to increase.

In the following exchanges from March 31, we see our first examples of students using talk moves themselves or responding as if they had been prompted by a talk move.

- Line Speaker: Discourse from March 31
- 80 **T: How about Claire? Do you want to tell everybody what you think Claire?**
- 81 Claire: I was gonna use my card.
- 82 **T: Great, use it.**
- 83 Claire: Going back to T's point, I think that by using this plane, people could take like examples like what to do in the future like so like there isn't as much pollution like you know acid rain right? And like not that much smoke, excuse me, not that much smoke in the air so the birds, it wasn't burning on fuel, so that's good because it wouldn't be in the air being evaporated in to precipitation.
- 84 **T: Okay, so talking about *hope, tomorrow, the future*, makes me also**

want to draw a connection to Langston Hughes’s poem, right?
 85 Claire: Yeah, excuse me, because probably in the next something years
 we wouldn't have that much stuff to use.
 86 **T: Aisha would you like to add something?**
 87 Aisha: I would like to rephrase Claire's point.
 88 **T: Mm-hmm.**
 89 Aisha: We're global citizens and it's our job to take care of our Earth, it's
 all of our jobs. And if pollution continues. It could have a big impact on
 everything and everyone. We have to-
 90 **T: How did you come to that conclusion?**
 91 Aisha: I used my brain.
 92 **T: Could you tell us more about what you mean?**
 93 Aisha: Pollution is obviously not helping us. It's killing animals and it's
 probably also not good to be breathing gas or anything else.

In this exchange, we see two examples of students making productive contributions without necessarily being prompted. In line 80, the teacher asks Claire to “tell everybody what she thinks” in response to an earlier question prompt asking students to draw connections between the solar-powered plane and the citizenship theme. In line 83, Claire begins her statement by specifically referencing and building on a previously made comment by the teacher. In addition, Claire announces that she is “gonna use my [her] card” in line 81. The card she is referring to is the index card containing academic language functions/examples that students were provided with and asked to use in that day’s discussion. It seems like having the card as a scaffold might also support Claire in autonomously selecting and using functions that support the comment she is about to make. Further down in that same passage, in line 90 Aisha independently states that she would like to “rephrase Claire’s point” and she continues to do so even though the teacher asked if Aisha would like to *add* something to what Claire said. At the same time, teachers use various talk moves in this exchange as seen in lines

86, 90, and 92, and students have had multiple opportunities to engage in discussion with the implementation of these instructional talk strategies, making it difficult to tease apart what exactly is attributed to these shifts in student talk.

In the following examples from a later transcript (April 28), the use of Expand and Listening/Repeat talk strategies shape opportunities for students to deepen their reasoning and attend and respond to their peers' thinking. In some instances, however, students listen to and respond to their peers' ideas without being prompted to do so.

Line Speaker: Discourse from April 28

- 1 **T: {Teacher points to handout.} How do you think it feels to have to fetch and carry 40 pounds of water, twice a day, for a half-mile?**
- 2 Thao: In my opinion, I think that it's very like, they're very tired and it's like heavy to carry all the way back.
- 3 **T: Tell me more. You said you think it's very tiring to fetch the water. Why?**
- 4 Thao: Because, it's heavy and they help each other, they don't have strength, they are kids, they are not adults.
- 5 Victor: They're kids and it takes a lot of physical effort for them because to just walk half a mile, just walking. Still. Walking half a mile and walking back that's a whole mile. That's tiring and as well as 40 pounds.
- 6 Aisha: I agree with Victor's point because when we went over there to hold the water it was heavy and then you do that plus walking for a long time.

In line 3, the teacher uses to the Dig Deeper talk strategy. In the next line, the student deepens her reasoning, adding to her idea a comparison of children and adults' strength. In turn, the next student to speak builds from this comparison, beginning with "they're kids . . ." Then, notably, Victor builds on Thao's idea without prompting, and in the next line, Aisha says, "I agree with Victor," again building from a fellow student's idea without prompting from the teacher. In other words, the use of talk moves causes a chain

reaction among students. This suggests that not only did the teachers' moves promote student–student interchanges, but over time, students also exercised their agency as participants in collaborative, reasoning-focused discourse. These types of exchanges, in which students build on their peers' ideas without being prompted to do so, appear to increase in frequency over time (when comparing the later transcripts to earlier transcripts).

In the following episode from May 5, students engage in a discussion after listening to a news clip presenting the pros and cons of single-gender schools. Before the whole class discussion, teachers previewed key vocabulary terms (stereotypes, generalization) and then had the students identify the perspectives in the text, while also listening to stereotypes they encountered about boys and girls (e.g., on the playground, in sports, in school). Teachers then set up the discussion by asking students to share their views, while also referring to the text, of the pros and cons of single gender learning. In the transcript below, it takes only one use of the Think with Others talk strategy (line 74, “anyone want to add to that?”) to generate three responses in which students explicitly refer to a peer's idea with the use of the peer's name or pronoun (lines 77, 79, 85), indicating in more certain terms that they are building on each other's ideas:

- 73 Ana: Um, oh yeah, so it seemed to me that like, I kind of thought that um, boys needed to be more hands on, and girls don't really need that, but I know for myself, I do need hands on. Just like, just helps me to understand better.
- 74 **T: Okay, so you're a hands-on learner. Maybe you're a girl and you're fidgety, so what if you're put in an all girls school, and you have the fidgets? You might not fit into that context. Okay, good point. Does anyone want to add to that? Yes.** G4
- 75 Sargis: Adding to what Amin said. SRS
- 76 **T: Okay.**

- 77 Sargis: So, I agree with Amin, that like for example, it's an all boys school, and like the other boys need a fidget or something to help them focus. Maybe not one specific boy might not need it. Maybe he doesn't need anything. SRS
- 78 **T: Okay, so single gender schools may lead to stereotyping.**
- 79 Ian: I actually agree with Ana. Some boys need to fidget, and also some girls need to. Some boys don't even need to fidget, because they're focused on it. SRS
- 80 **T: Okay, so what's a vocabulary word that we learned?**
- 81 Ian: Not all boys need to fidget.
- 82 **T: Right, so it's a 'stereotype,' if we say all boys are fidgety.**
- 83 Ian: And girls also need to fidget, so, in general most people need to have, some people have to fidget, some people don'.
- 84 **T: Yeah, I'm a fidgeter.** <LAUGH>
- 85 Sara: I agree with what Ana and Ian said. Like, not just boys need to fidget. I personally, I like to do interactive things with learning, and that helps me learn better. SRS (2)

As these examples demonstrate, over time, students assumed greater responsibility for the progression of the discussion without always passively waiting for a teacher to prompt them to do so. These shifts may have been attributed to increased practices and supports featuring academic language function and/or multiple opportunities to practice in settings where the APT talk strategies were being implemented.

In addition, to supplement this qualitative descriptive analysis and to better understand if and to what extent students were becoming increasingly autonomous based on their unprompted (by the teachers) responses and contributions to the discussion, I coded and quantified one particular type of unprompted student response. I focused on the instances in which a student references a peer's idea—by name or pronoun— without having been explicitly prompted to do so by the teacher in the previous turn. Prior to ascertaining, via quantitative measures, whether students were becoming increasingly

autonomous, first I had to be clear about how I defined “prompted” and “unprompted” student responses. A “prompted” response was defined as follows: A student references a peer’s idea—by name or pronoun—after having been explicitly prompted to do so by the teacher in the previous turn with either a Listen and Repeat move (e.g., T: “*Can you repeat what Fatima just said?*” S: “*Fatima made the point that . . .*”) or a Think with Others move (e.g., T: “*Who can add to what Fatima just said?*” S: “*In addition to what Fatima just said about rights, I also think . . .*”). In these examples of students referencing their peer’s ideas, the teacher has directly prompted them to do so. An “unprompted” response was defined as follows: A student references a peer’s idea—by name or pronoun— without having been explicitly prompted to do so by the teacher in the previous turn. The criteria I decided on for coding responses as “unprompted” comprised: (a) The student references a peer’s idea following at least one other student who has already directly responded to the teacher’s Listen and Repeat prompt or Think with Others prompt (e.g.: T: “Does anyone want to add to Mia’s idea?” S1: “I actually disagree with Mia’s idea. When the tsunami happened . . .” S2: “Well, no I don’t agree with S1 or Mia because . . .”); (b) The student responds to a peer’s idea after the teacher has prompted a different kind of response in the previous turn (e.g.: T: “*How did you come to that conclusion?*” S: “*Well, like Victor was saying earlier that technology is not always helpful . . .*”); (c) The student responds to a peer’s idea directly after a student (or several students have spoken in consecutive turns) has spoken, and without having been prompted by the teacher in any recent turns to do so; and (d) The teacher prompts the class to respond to a particular student’s idea who spoke in the previous turn, but the

student then responds to a different student’s idea (from several turns ago or from a previous class discussion).

As shown in Figure 13, over the course of the study, the proportion of “unprompted” student responses to “prompted” student responses increased, suggesting that increased opportunities to engage in “Academically Productive Talk” as well as increased exposure to and practice with academic language functions fostered increased student autonomy in referring to and reasoning about other students’ contributions.

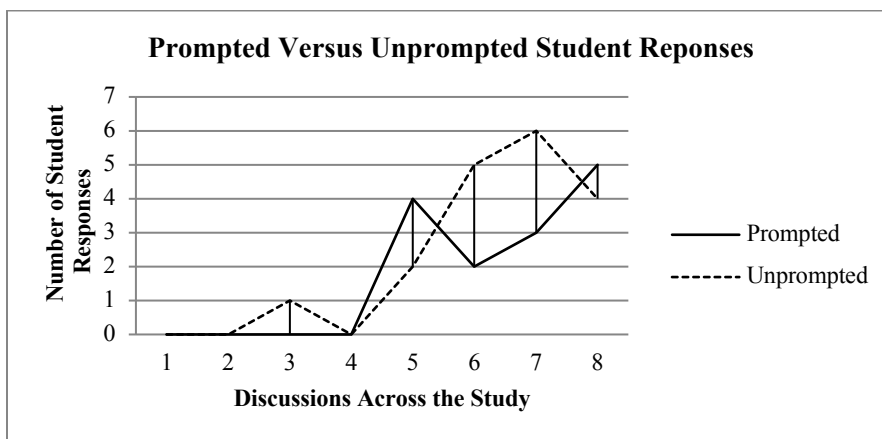


Figure 13. Students reference students’ ideas by name or pronoun: Prompted vs. unprompted.

In true Vygotskian tradition, this shift of increased autonomy requires a skillful release of responsibility over time, and had there been more time in the study, perhaps teachers could have fostered even more independence (i.e., the teacher stepping out of the discussion completely). While signs of increased autonomy were definitely surfacing in transcript for the whole class discourse, I found, however, that in this particular classroom context, students were not ready to engage in productive discourse completely

on their own without instructional scaffolding (talk strategies) and academic language supports and reminders. These supports continued to be helpful all the way through to the end of the term. This became evident on April 7, as highlighted in my field notes, when students had the opportunity to engage in a Fishbowl discussion without instructional discourse or language supports to scaffold the talk. The teachers provided students with a discussion prompt and asked students to engage in a discussion on a text, while the teachers remained silent on the side. In my field notes, I commented on the fact that the only two of the eight students (in the Fishbowl) contributed to the conversation, and talk quickly morphed into a conversation where students shared opinions as if engaged in small monologues, and did not appear to be listening to and responding to each other's ideas. In addition, the flow of the discussion ended abruptly when students appeared to have exhausted all there was to say on a very complex topic in a very brief amount of time, indicating that teacher's use of talk moves were necessary to sustain and deepen discussions even toward the end of the study. Nevertheless, in the structured, teacher-facilitated whole class discussions, students appeared to be taking on greater responsibility and to be exercising their agency as participants in reasoned, collaborative discourse over the course of the study.

Summary of Findings

In conclusion, the analysis of the quantitative data revealed several important trends. Teachers increasingly used APT moves (particularly, Expand and Thinking with Others) and implemented the integrated use of all four types of APT strategies in the later parts of the study. In addition, there were shifts in student discourse over time. Students

engaged in more talk during discussions; they contributed a greater percentage of the talk, and their turns of talk were longer. In addition, their engagement in reasoning increased, as their use of reasoning words indicated, and they increasingly built on the ideas of their peers. This increase seemed to be unconnected to the frequency of reasoning words in the texts used in class. Finally, students appeared to be using some of the explicitly taught language functions and structures (in particular the language for sharing/expanding/elaborating and the language for thinking with others).

The data in the qualitative analysis suggest that: (a) Teachers' explicit and frequent use of the APT moves appeared to be an important support for deepening student reasoning and for promoting a rich, collaborative exchange of ideas. In addition, when teachers purposefully shifted and navigated all four types of strategies, they fostered an environment with a rich and communal exchange of ideas; (b) To promote the verbalization of students' reasoning, not only was it important to encourage students to develop and articulate their individual reasoning, but it was also important to increase the exposure of multiple students' ideas in general; additionally, it appeared to be important for teachers to use moves that led students to consider and react to others' ideas: Students' ideas became more cogent and reasoned the more responsive they were to what others said; (c) In addition to teachers continually explicitly teaching, modeling, and scaffolding academic language, it was necessary to provide students with multiple opportunities to practice applying these linguistic functions and structures in meaningful ways. Over time, not only did students use these expressions with more frequency, but they also developed their own ways of expressing the moves and language functions. In

addition, the increase in use of this specialized language also seems to support that initial goal of promoting reasoning-focused, dialogic discourse; and (d) Finally, although students continued to benefit from the scaffolding provided through the use of talk moves, qualitative and quantitative analyses revealed that students exercised greater agency as participants in dialogic discourse over time. This shift may have been attributed to the scaffolding of academic language functions or the use of APT moves—or more likely, a combination of the two.

In this chapter I examined the shifts in whole class discourse over the study in order to get a sense of how the scaffolds were working for the Inclusion class as a whole. In the following chapter, I concentrate on the EL subgroup of learners and I explore if and how the shifts in whole class discourse are also evident in the individual talk of ELs in the classroom. In doing so, I examine the data both quantitatively and qualitatively through an EL lens.

CHAPTER 6:

EXAMINING SHIFTS IN THE TALK OF ENGLISH LEARNERS

Although the transcript analyzed in Chapters 4 and 5 included EL students' talk, I did not differentiate ELs from non-ELs in the previous analyses. Nor did my analyses include insights on how the instructional scaffolds might have supported the particular needs of students who were improving their command of English while also developing content knowledge. In this chapter, I concentrate on the talk of EL students to examine if and how the shifts in whole class discourse also occurred for this subgroup of learners.

To gain an understanding of how the codesigned intervention did or did not work for the students identified as English Learners in this classroom context, I took the following steps. I began by examining the individual memos I had developed for each student identified as an EL and then generated themes from the patterns and trends in the talk of these students, both as individuals and as a subgroup. I also used quantitative data to elucidate the analysis of the ELs' discourse, specifically with regard to ELs' participation (amount of talk), reasoning, engagement in collaborative talk with their peers, and use of explicitly taught academic language. Next, I examined evidence that linked possible shifts in student discourse to design choices. Finally, drawing from both quantitative and qualitative data for the whole class discourse, I generated claims about shifts in the EL students' discourse and compared them with the trends and shifts in the whole class discourse.

From the analysis, I determined that my claims about whole class discourse were generally true for the EL subgroup. However, I also identified some differences, which I

also explore in this chapter. In addition, I examine the relevance of these claims to second language development.

Recall from Chapters 2 and 3 that my analysis is grounded in van Lier and Walqui's (2012) "language as action" perspective, a sociocultural approach in which language development is not seen merely as an "inner, cognitive process of sequentially mastering more complex syntax and vocabulary to eventually accomplish a broader range of functions," but is instead developed through "negotiated and shared experiences during which participants construct and represent meaning together through language" (MacDonald et al., in press, p. 5). Thus, the analysis presented in this chapter is examined in light of shaping opportunities for students to use language and engage in reasoning while participating in the sense-making and collective thinking processes with their English proficient peers in support of second language development.

Description of Students Identified as English Learners

As described in the Methods chapter (see Table 3), the students classified as English Learners—Amin, Sargis, Dario, and Fatima—spoke Farsi, Armenian, Portuguese, and Pashto as their home languages. Their performance on WIDA/ACCESS testing was characterized as "developing" (Level 3) or "expanding" (level 4). Although these students had sufficient English language abilities to use expanded sentences when engaging in oral interaction, they did not yet qualify as having oral and written language "approaching comparability to that of English proficient peers when presented with grade level material" (WIDA ELD Standards).

Initial Participation

The ESL and general education teachers, who had gotten to know the students in Discussion Fridays or in other instructional contexts (the ESL teacher pushed into several of their other content courses and was able to observe them in a variety of settings) noted that Fatima, Dario, Amin, and Sargis were generally silent or reticent in their mainstream classroom settings, especially in whole class discussions contexts.

In general, the talk of the EL students mirrored the patterns of whole class discourse in the baseline transcripts in that initially, there were not significant differences in the way they were participating in class discussions. When the ELs participated, they usually uttered abbreviated responses to specific questions from the teachers. They made few attempts to verbalize their reasoning and did not engage with their peers' ideas in meaningful ways. Moreover, early in the investigation, these students were not yet using the academic language functions that support communication in academic discussion contexts, even though they had been exposed to these specialized forms of language through explicit teaching in Discussion Fridays classes. Quantitative analysis from Chapter 4 has already revealed that there were either very low or zero incidences of any students, including ELs (a) using reasoning words, (b) referencing each other's ideas by name or pronoun, or (c) using explicitly taught academic language. I have already shown how these patterns hold true for the whole class, so the examples below are included to show that they are happening among the EL students.

In the transcript from January 13, we can see examples of the EL students uttering abbreviated responses to teachers' specific questions in lines 17, 19, 22, 23, and 25.

These types of exchanges reappear often in the baseline transcripts, suggesting that these students had little opportunity to share their perspectives, articulate their reasoning, or interact with their peers—the speaking practices that are key to fostering second language development while also supporting content learning.

- Line Speaker: Discourse from January 13
- 16 **T: What are these humans asking for? What are they asking for, Dario, in the pictures, Dario? What are the people asking for in the pictures? Can you read what it says?**
- 17 Dario: ‘March in Washington for jobs and freedom.’
- 18 **T: What else?**
- 19 Dario: Equal rights.
- 20 **T: Are people asking for airplanes, bridges, and spaceships? No. What are they asking for?**
- 22 Sargis: Equal rights.
- 23 Dario: Jobs.
- 24 **T: Jobs, food, and...? (2 second pause)**
- 25 Amin: Equal rights.

Additionally, other patterns in the qualitative analysis showed that in the few instances in which the EL students used reasoning words in the baseline transcripts, they were mostly paraphrasing text, reading verbatim from the text, or using reasoning words to express underdeveloped ideas just to provide an answer to the teacher’s question, as in the following example:

- Line Speaker: Discourse from December 16
- 4 **T: So Thao, one more time, what does she think?**
- 5 Thao: Every student should be responsible.
- 6 **T: Oh, someone wanna help out Thao? Yeah, Fatima, a piece of evidence. What does she say in the reading?**
- 7 Fatima: Um, in this, um (2 second pause)
- 8 **T: In this, what does she say that makes you --**
- 9 Fatima: Because she told you, um, other people should be responsible?

In line 9, Fatima attempts to “help out” her peer (Thao) by providing a paraphrase of what Christina (the character in the text) says to support that Christina does not think the “Good Behavior Game” is a good idea. However, Fatima does not offer any new information or build on what Thao has already said when she “helps out.” Additionally, her response is limited, and Fatima does not develop her ideas by introducing other rich evidence present in the text. Although Fatima begins to use words like “because” and “should” in line 9 to frame her reasoning and to paraphrase the text, Fatima also falls short in developing her idea or argument beyond simply restating an obvious point that another student has already made: “Christina said that people should be responsible.” Fatima does not draw from any other evidence in the text, nor does she elaborate on her reasoning.

In another example from the baseline transcript, Sargis uses one of the tracked reasoning words, but upon closer examination, it becomes clear that the utterance of the word in this particular context does not indicate that reasoning is at work:

Line Speaker: Discourse from January 13
34 T: Instrumentalities. Okay, Sargis, tell everyone why did they matter?
35 Sargis: Because, be-be- I forgot.
36 T: No you didn't. Why did they matter? Because, why?
37 Sargis: Um, because every man lives in two realms?
38 T: And this is how...?
39 Sargis: They live?

In line 34, the teacher calls on Sargis to explain the significance of “instrumentalities” in the text. As Sargis’s rising intonation (as in a question) in line 37 shows, he appears to be trying to provide the correct answer that the teacher wants to hear. Then, in line 39, he attempts to complete the teacher’s sentence in order to guess at the “right” answer. This

is evident because his response is a question rather than a reasoned assertion: “Um, because every man lives in two realms?”

In the following section, I draw from the quantitative and qualitative analysis I conducted for the whole class and for individual ELs across the implementation of the instructional design in order to generate evidence-based findings. Specifically, by identifying patterns that emerged for ELs across the study, I was able to deepen my understanding of how the various codesigned interventions affected the ELs and compare these results to those of the whole class.

Shifts in Discourse

Claim 1a: Opportunities to Listen to and Produce Language in Contextualized and Purposeful Ways

Over time, teachers’ regular and conscious use of APT moves to forefront the goal of student engagement in reasoning-based discourse not only promoted a rich, collaborative exchange of ideas for the whole class, but also created the conditions for second language development to flourish. Teachers’ explicit and frequent use of the APT moves created opportunities for ELs to practice speaking and expressing their reasoning while interacting with their peers. I support this claim by showing how EL talk shifted in quantity (more talk, longer turns) and quality (reasoned talk) when teachers began to systematically implement the four APT goals and their corresponding moves.

Quantitative analysis. Similar to the upward trend in the trajectory for the whole class discourse. Figure 14 shows that EL students’ average words per turn also increased

over the course of the study.⁵ In general, although Amin’s talk appears to increase more than the talk of his EL peers, we see that all ELs’ turns per talk increased over time, with clear shifts occurring after the codesign was implemented on January 20.

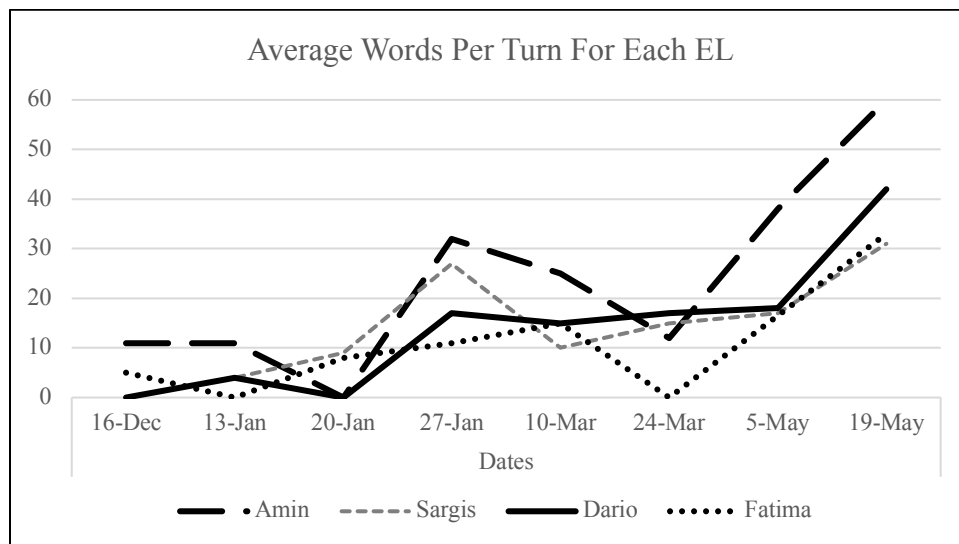


Figure 14. Average words per turn for four ELs (individually).

Moreover, quantitative analysis shows that ELs not only talked more, but also reasoned more over the course of the study than they did at the beginning of the study. Use of reasoning words in the early transcripts was infrequent or simply not indicative that reasoning was at work in the particular context of the transcript exchange. Table 18 shows a general upward trend for each EL’s use of reasoning words in discussion over time. Recall in the analysis of the baseline transcripts that although Amin produced 5 reasoning words on 12/16, he was mostly using these words when paraphrasing the text.

⁵ Note here that if there were no turns on a particular day but the EL was present, I factored in zero for that individual on that day. I did this because I wanted to get a precise understanding of how these turns were distributed across individuals in the EL subgroup.

The other English learners produced few, if any, reasoning words between 12/16 and 1/20. A shift appears to take place around 1/27 and 5/19, showing that ELs were using these words more frequently following the intervention.

Table 18

ELs' Use of Reasoning Words Across the Study

Date	Amin	Sargis	Dario	Fatima
12/16	5	0	0	0
1/13	1	1	0	0
1/20	0	0	0	0
1/27	2	2	6	1
3/10	11	3	8	3
3/24	4	6	6	0
5/5	8	5	0	NA
5/19	15	5	4	6

* Normalized to 15 minutes

Trends indicated that in general—just as they had for the whole class—EL students talked more, produced more words per turn, and reasoned more as the study progressed over time. In the ensuing qualitative analysis, I examine the talk of EL students more deeply as I show how these aforementioned shifts played out in the transcripts and explore how we might attribute these shifts.

Qualitative analysis. Further qualitative analysis sheds light on how forefronting the APT goals shaped multiple opportunities for ELs to actively use English and gain practice producing extended, reasoned discourse.

First, APT goals helped students talk more and produce longer turns. In the following example from January 27, we see how a Listen/Repeat move creates opportunities for Fatima to be accountable for what her peers have said, receive input

from English-proficient students, and then produce that input through extended discourse.

Line Speaker: Discourse from January 27

46 **T: Okay, so you've had a chance to make connections with these real-life examples and now you have your theme of citizenship. Have you thought about what rights students might have, or what rights people might have, or what rules, or what responsibilities? Can somebody add something about the role of citizenship to the discussion?**

47 Ana: One of the responsibilities that people have is to make other people from other countries feel welcome.

48 **T: Okay, someone we haven't heard from. Who can tell us in their own words what Ana just said. Someone who I haven't heard from today?** (2 second pause)

49 **T: Do you need her to say it again? Go ahead and say it again.**

50 Ana: One of the responsibilities that everyone has is that you have to make other people from other countries feel welcome here.

51 **T: Say what she said in a different way.**

52 Fatima: To make people feel comfortable because they are away from home.

In line 47, Ana responds to the teacher's question, and her response is followed by a Listen/Repeat move from the teacher. When no one volunteers, the teacher asks Ana to repeat her original comment. Then, Fatima volunteers "to say what she said in different words" in line 52 and produces a longer turn than she had in earlier discussions. Both Fatima and Dario—the two EL students teachers characterized as the most resistant to participating in group activities—appeared to respond to Listen/Repeat moves more frequently than any other participants, including non-EL students, over the course of the study. This suggests that these moves may provide more reticent (or less confident) communicators with a stepping stone or entryway to discussions because one way of articulating an idea has already been modeled for the students.

In addition to allowing students to speak more often and produce longer turns, various APT moves encouraged ELs to develop their ideas and reasoning. In the

following exchange from February 10, we see how the Say More move creates space for Fatima to produce a more elaborate and reasoned response.

- Line Speaker: Discourse from February 10
93 Fatima: Having girls, um (2 second pause)
94 **T: What, can you say more?**
95 Fatima: Having girls equal rights
96 **T: So what did she have to do so women would have rights? Or girls would have rights? Especially so girls could go to school in Pakistan?**
97 Fatima: She had to, um, [indecipherable]
98 **T: She had to do what?**
99 Fatima: She like gave speeches for girls' education.
100 **T: Can you tell us more about that?**
101 Fatima: She was explaining how she gave speeches cuz she has to fight for her right and stuff.

In this exchange, we see that Fatima provides incomplete ideas in the form of abbreviated responses in lines 93 and 95. In line 99, Fatima produces a simple sentence. However, after the teacher repeats the Expand move in lines 94 and 100, Fatima provides a more developed idea in a complex sentence structure in line 101. Fatima also uses the reasoning word “cuz,” indicating that she is not only saying more, but is also verbalizing her reasoning.

In the next exchange from March 24, we see another example of an EL student (Sargis) producing an extended turn and engaging in the reasoning process after the teacher uses one of the Expand moves (“Tell me more”).

- Line Speaker: Discourse from March 24
96 **T: From someone who maybe hasn't said much, what else do they talk about? Maybe Sargis, what else do they talk about besides just an Xbox?**
97 Sargis: They talked about our environment.
98 **T: Can you tell us more?**
99 Sargis: Um, they were talking about how, like, there was like trash around the like beaches, and they had to like clean it up. And, um if we were like um cleaning the trash, that probably would have help Japan more.

Sargis goes from producing a simple sentence in line 97 to producing an extended, reasoning-based turn in order to express a complex idea in line 99. Moreover, Sargis has the opportunity to produce more complex grammatical structures to convey his idea, as he transitions from a simple sentence in line 97 to compound sentences and relative clauses in line 99.

In the next example from March 24, we see how the use of the Think with Others strategy in line 31 sustains the conversation while building in opportunities for students to talk and explore ideas.

- Line Speaker: Discourse from March 24
- 27 Ian: Debris off their beaches can come over here. We should help them, it can affect lots of sea life. We should send them money to help like, clean it up or send people over to clean it up.
- 30 **T: Okay, so you're saying we are interconnected, even though they are far away, this problem, that debris from their beaches can reach other beaches? That is what you're saying?**
- 31 Ian: You won't feel like it affected us, thinking oh, someone's house fell down or something.
- 32 **T: Can anyone add on to what Ian said? Dario, you had your hand up.**
- 33 Dario: I'd like to add on what Ian said.
- 34 **T: Yes, don't forget to use your cards.**
- 35 Dario: In addition to what Ian said, just 'cause like you're far away from what the tsunami doesn't mean you can't go there and help. If it happens to you, other people would probably help you, so why won't you help them?

In line 27, Ian explains why the tsunami in Japan was a global problem that did not just affect those living in Japan. The “Who can add to that?” move activates the class to explore this idea further, simultaneously building in opportunities to practice speaking in English. The exploratory, collective thinking nature of the conversation results in students no longer attempting to call out “correct” answers in abbreviated responses (as depicted in the baseline transcripts), but providing more complex, reasoned responses,

like Dario's in line 35 and the talk of other ELs and non-EL participants throughout the post-baseline transcripts.

In the following passage from March 31, we see how the "Say More" move is used twice in lines 5 and 7. It also appears to result in more talk, longer turns, and increased opportunities to practice speaking in English.

- 1 **T: Okay, so what's your impression of the airplane, of the solar-powered airplane?**
2 Amin: Very big.
3 **T: Who said it's very big?**
4 Amin: Me.
5 **T: Okay so tell us more. I think... can you tell us more about that idea?**
6 Amin: It was very big.
 <LAUGH>
7 **T: Okay so let's be serious now. Okay? We've started. The question was... what's your impression of the plane? Amin said he thought it was big. Amin tell us more about that.**
8 Amin: I think the plane was big by size because the... *wings*, they called *wings*?
9 **T: Mm-hmm...**
10 Amin: The wings were completely made out of solar panels. That's what interest me.
11 **T: Could somebody use one of your cards to either build on his idea or if somebody thinks differently? Use your card, Ian.**
12 Ian: However, the plane was small because if it was big, the engine would need more energy to run, so they had to design it small, so the less solar power.

First, Amin extends his response from a phrase ("very big") to a simple sentence ("It was very big"). Then, Amin proceeds to give slightly more developed and reasoned responses in lines 8 and 10, when he tells us what he means by "big." In the process of developing his idea further, Amin also asks for affirmation on whether the use of the word "wings" is correct and receives it from the teacher in line 9. This pattern repeated over the course of the study: ELs initially provided short, undeveloped responses, until a

teacher held them accountable with an Expand move or a Dig Deeper move. This, in turn, leads ELs to explicate their thinking further, while also getting practice and taking risks with language use and getting feedback in a contextualized and meaningful academic context.

In sum, forefronting the APT goals supported shifts in the amount of talk and engagement in reasoning done by EL students, just as it did for the whole class discourse. Although all four talk strategies supported these shifts, the more reticent English learners appeared to take on the Listen/Repeat strategy and participate with greater frequency after those moves were introduced. Furthermore, examining these shifts through the EL lens shows that students increased opportunities for learners' active use of the language in purposeful ways as they engaged in listening, expressing complex ideas, and producing extended, reason-based talk in a situated learning context—all key to second language development.

Claim 1b: Fostering Peer-to-Peer Interactions and Equitable Participation

Similar to trends in whole class discourse, the various talk strategies not only afforded more opportunities for talk and reasoning, but also for increased interactions among students as they engaged with each other's thinking. A particularly distinct and illuminating pattern in the qualitative data was how the use of Listen/Repeat and Think with Others moves—in tandem with teachers being intentional about calling on the diverse range of voices—shaped opportunities for ELs to engage in interactive sense-making and reasoning with their English-proficient peers. From the sociocultural perspective of second language development, opportunities to practice using language

and interact with more knowledgeable others is critical to (a) fostering linguistic competence (Clegg, 1996; Vygotsky, 1987) and (b) affording ELs equitable opportunities to take place alongside their peers in mainstream classrooms (Hawkins, 2005). The following two exchanges exemplify how the use of the moves supported integration and interactions between ELs and non-ELs; such integrated exchanges were repeated often over the course of the study.

In the following passage, we can see how the use of the Listen/Repeat strategy fosters an integrated, inclusive classroom while affording ELs opportunities to practice using language with English-proficient peers. When it appears that no one heard Dario's original comment in line 14 (as nobody volunteers to repeat his phrase), the teacher asks Dario in line 16 to repeat his original comment.

- Line Speaker: Discourse from January 27
- 14 Dario: Sometimes the majority of the people usually, sometimes they try, but sometimes they feel that they can't do anything else, because the other kid doesn't know how to speak.
- 15 **T: Who can tell us in their own words what Dario said?**
- 16 **T: Can you say what you said again because some people didn't hear.**
- 17 Dario: The majority of the group usually tries, but when they feel like they can't do any better they just give up because they don't know how to speak English.
- 18 **T: So who can tell us what Dario just said in their own words?**
- 19 Sara: Most people, they don't think that, they don't think that they would fit in because they don't speak English so they just don't even bother.

This exchange not only provides Dario with an opportunity to express his idea a second time and refine or clarify his original comment, but it also prompts interaction among ELs and non-ELs. In line 15, the teacher asks again, "Who can rephrase or repeat what Dario said?" Then, in line 18, Sara paraphrases Dario's comment. In sum, the talk

moves lead to an exchange that provides Dario with an extended opportunity to use language and perhaps refine his original idea while also promoting interaction between Sara and Dario. Additionally, this process validates Dario's voice in the mainstream classroom setting, as it highlights his point and holds others accountable for listening to and understanding his message. Finally, in line 18, Sara also provides new language input ("they don't fit in"; "they don't bother") as she paraphrases the comment, so Dario can hear his own idea expressed in a different way.

The following exchange from March 10 exemplifies how Think with Others moves promoted rich student-to-student interchanges between ELs and their English-proficient peers.

- Line Speaker: Discourse from March 10
- 106 Fatima: I think it means that other people, like, are the same.
- 107 **T: Who can add, we haven't heard from you Sargis, tells us how this is related to 'I too sing America, I am America.'**
- 108 Sargis: He's probably says when I say 'I, too am America' he is American, so they should treat him equally.
- 109 Dario: I think he's trying to say, he is American, so why can't he get treated like everybody else?
- 110 Victor: I was going to say that.
- 111 **T: Just build then on what Dario said.**
- 112 Victor: America wouldn't be a country without people, so he's also part of America, he deserves to be treat just as everybody else is. Because without its people, America would just be a name, it wouldn't be an actual country.
- 113 **T: Right, so he's saying, I have the right to feel patriotic, I'm just as American as anybody else, is that right?**
- 114 Ian: I want to add on to what Dario said and Victor that we're all from America, we're all people no matter where we're from, if we're in America, we should all be treated the same. We should all get equal rights and if we're in America, no one should be treated differently. We're all people.
- 115 **T: Okay, so that's a great connection to our theme, would you like to add to what Ian said?**
- 116 Dario: I would like to add on to Ian. It's not fair that if you're American, and if other people, and you don't get treated the same way, because you

- guys are both the same there's no differences between you.
- 117 **T: Final comment to add, Amin?**
- 118 Amin: Because, maybe if he's not American, but maybe he's African American, or maybe he's Indian, or another person. But he can still be an American, and he can be talking like he's not an American, but he can still be an American citizen, he's just from a different country. Other people use him as a slave but he is still American, but other people might not know.
- 119 **T: Okay, so you're going back to last week, we said the only true Americans are Native Americans. Everybody's from somewhere else.**
- 120 Dario: I'd like to add onto Amin. If someone is from another place, they can still be American but they don't have the right to treat them a different way.

In the above exchange, the teachers ask students to draw connections between the lines “I, too sing America” and “I, too am America” and the overarching theme of citizenship. The use of the Think with Others moves in lines 105, 111, 115, and 117 leads to multiple ideas being seeded into the discussion, allowing for ELs and non-ELs to engage in interactive sense-making while also shaping an inclusive learning environment in which the voices of ELs are fully part of the critical discourse. It is also important to note how in lines 107 and 117, the teacher calls on both Sargis and Amin, thereby consciously supporting an inclusive environment.

In summary, this pattern reoccurs in transcripts across the study and reveals the following conclusions. First, the teachers' explicit and frequent prompting allowed the four students developing their English to extend their thinking, listen to others, deepen individual reasoning, and engage in collective thinking in this classroom context. Second, in tandem with teachers consciously calling on students in equitable ways, using the Listen/Repeat and Think with Others strategies created rich opportunities for

language development and integration, as ELs had increased opportunities to engage in interactive sense-making with their native proficient peers.

Claim 2: Collective Thinking Supports Individual Reasoning for English Learners

In the same way that increasing the exposure of multiple students’ ideas into the discussion seemed to promote the verbalization of students’ reasoning in the general analysis of the whole class discourse, the same rang true when focusing solely on the subgroup of ELs. In other words, EL students’ ideas became more reasoned the more responsive they were to what their EL and English-fluent peers said.

In fact, similar to the trends in whole class discourse, the quantitative data focusing on ELs revealed that on the days all four APT goals were used, there were also higher incidences of ELs referencing their peers by name or pronoun in discussions. The incidences of students using reasoning words also increased, as shown in Figure 15.

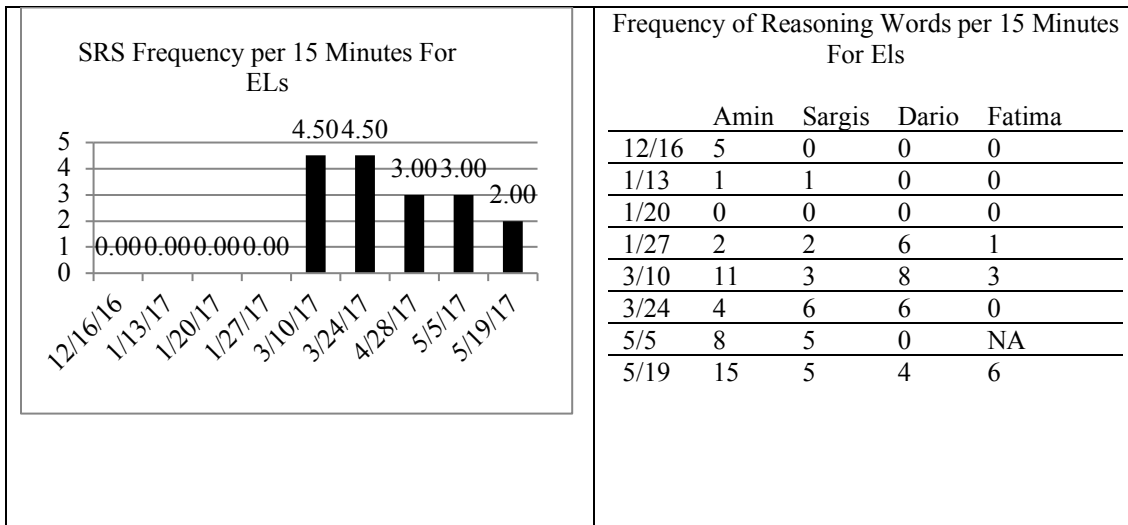


Figure 15. Frequency of ELs’ referencing their peers (by name or pronoun) and use of reasoning words.

Additionally, patterns in qualitative data revealed that these shifts might have been linked to students' increased exposure to and practice of academic language for discussion, in particular, explicitly taught academic language for "thinking with others" (e.g., I agree/disagree with X; I'd like to add/build onto what X said).

For example, in the following transcript from March 10, there is a notable increase in student reasoning as students raise inquiries and respond to each other's ideas, rather than only responding to the teachers' prompts.

- Line Speaker: Discourse from March 10
- 80 Aisha: If he meant something else why did he say 'tomorrow'?
- 81 **T: Can you answer Aisha's question or do you have a different comment. What's your response to Aisha?**
- 82 Amin: I can answer it. Maybe by tomorrow, she means like a whole new day. She doesn't mean tomorrow I get to eat again, she doesn't mean tomorrow I will eat like the day I had done before, because I don't think the person is trying to say 'Tomorrow I'm going to eat again, yay' I think he means 'Tomorrow is a new day, I'm starting over, I'm having a new life.'
- 83 **T: Okay, so I might not know the exact day, but the speaker feels hope for the future, the future in general, maybe not the day after tomorrow. Okay, do you want to add to what Amin just said?**
- 84 Fatima: I don't understand what he Amin said.
- 85 **T: You don't understand what Amin said? Okay, can I have anyone put what Amin said in their own words?**
- 86 **T: Yeah so what does Amin think tomorrow means?**
- 87 Ian: I understand what he said but I just can't put it into my own words.
- 88 **T: Why don't you, Max, give it a shot? You had your hand up.**
- 89 Max: That maybe, next time he would come back, he would um like, maybe he's trying to say that everything else will be like, (2 second pause)
- 90 **T: Different?**
- 91 Max: Yeah, like the other days won't count, just when he comes to the place where the dining is, to the dinner place where he makes the food for them. Maybe that's what he's trying to say, I can't...
- 92 **T: Okay does anyone else what to take a shot at it?**
- 93 Sara: Maybe he just means next time.
- 94 **T: Next time what?**
- 95 Sara: Next time they have company
- 96 **T: Ok, so maybe next time they have company, or maybe literally tomorrow, or as Amin said, maybe tomorrow is meant to mean**

sometime in the future, maybe even 20 years from now.

...

102 Aisha: So then, like, tomorrow is then, like, another word for the future?

In line 80, Aisha raises a question about the speaker's use of the word "tomorrow" in the poem. In response to her inquiry, Amin speculates, analyzes, and generates a claim about the speaker's purpose of the word "tomorrow" (line 82). Then, the teacher asks if anyone has anything to add to Amin's comment, when one student expresses that she did not understand what Amin said (line 84), and another claims to understand, but "can't put in into his own words" in line 87. In lines 89 and 91, Max attempts to explain what Amin said, and in lines 93 and 95, Sara gives her own explanation of what "tomorrow" means. In line 96, the teacher sums up the various students' interpretations of how the word "tomorrow" is used in the text, and finally, in line 102, Aisha concludes, "So then like tomorrow is then like another word for the future?"

Through this process of students raising questions, responding to their peers' inquiries, asking for clarification, explaining what others have said, and building on each other's ideas, students engage in claiming, speculating, analyzing, and generalizing as evidenced by their use of the various types of reasoning words underlined above. Moreover, we see that Amin's original claim triggers a chain of reasoning among his classmates, engaging a diverse set of voices in collective reasoning and validating Amin's voice as the other students examine and debate his original idea.

In another example from March 31, the class discusses a solar plane, and as multiple ideas are seeded into the discussion, the talk of both ELs and non-ELs becomes

more reasoned as they engage in collaborative problem solving and grapple with the sense-making process together.

- Line Speaker: Discourse from March 31
- 20 Max: Pretty cool.
- 21 **T: Tell us more, what makes it pretty cool?**
- 22 Max: It says it's almost as heavy as a van in the video. Usually planes aren't like that, that light. They're usually a lot heavier.
- 23 **T: Okay, can anyone explain what Max means?**
- 24 Amin: I want to add to Max because I agree with you because the plane was only two tons but regular day planes are 63. They're very heavy but I'm wondering how, I know it had propellers but I'm wondering how, I'm wondering how the solar panels don't burn up from the heat, that's what I'm wondering.
- 25 Ana: Well, it's not that hot.
- 26 **T: Maybe you could use your card and talk about that. Say I -**
- 27 Ana: I have a different point of view.
- 28 **T: Let's listen up, excuse me you guys need to stop doing that. Okay and so what is your point of view?**
- 29 Ana: The solar panels aren't so high that they could burn. They're high to get energy but they're not that high.
- 30 **T: Okay does anybody want to add on to that or clarify what Ana means?**
- 31 Ian: Yeah I want to clarify. It is pretty high but it's not that, the temperature isn't that much different down here on Earth on the ground. It might just be like ten or 15 degrees difference -

In the above exchange, we see how the teacher first uses an Expand move in line 21 to encourage Max to develop his idea more fully, followed by a Think with Others move in line 23. Amin agrees with what his peer said, providing a reasoned response in line 24. He agrees because “the plane was only two tons but regular day plans are 63 tons.” His use of positioning/claiming words and analyzing/generalizing words indicate that reasoning is at work. Then, in the same turn, Amin raises a question, and peers chime in and provide reasoned responses (lines 25, 29, and 31).

Claim 3: Multiple Opportunities to Practice Language in Context Supports

Engagement with Academic Language and Registers

My next claim is twofold. First, by explicitly teaching, modeling, and providing multiple opportunities to practice using these linguistic functions in an authentic context, teachers helped ELs use these specialized language functions more frequently and engage with the academic language register (of dialogic discourse), just as these same teaching strategies had done for the whole class. Second, a pattern from the memos revealed that ELs needed more time and scaffolding (e.g., practice and explicit instruction) before they began producing academic language when compared to the whole class. This suggests that ELs may need more time to develop the language mores and interactional competence necessary to participate in the social and cultural context of their new classroom environments. Because much of the analysis in Chapter 5 for the whole class included transcript examples of ELs taking on these language items with more frequency, I proceed to give only a few additional examples here of how ELs began to produce the explicitly taught language with greater frequency, albeit at a later starting point than the whole class.

On March 10, we see a good example of how Dario uses language in very different ways than he had in his earlier talk, when he offered only brief answers or tried to report correct answers.

Line Speaker: Discourse from March 10
114 Ian: I want to add on to what Dario said and Victor that we're all from America, we're all people no matter where we're from, if we're in America, we should all be treated the same. We should all get equal rights and if we're in America, no one should be treated differently. We're all people.

- 115 **T: Okay, so that's a great connection to our theme, would you like to add to what Ian said?**
- 116 Dario: I would like to add on to Ian. It's not fair that if you're American, and if other people, and you don't get treated the same way, because you guys are both the same there's no differences between you.
- 117 **T: Final comment to add, Amin?**
- 118 Amin: Because, maybe if he's not American, but maybe he's African American, or maybe he's Indian, or another person. But he can still be an American, and he can be talking like he's not an American, but he can still be an American citizen, he's just from a different country. Other people use him as a slave but he is still American, but other people might not know.
- 119 **T: Okay, so you're going back to last week, we said the only true Americans are Native Americans. Everybody's from somewhere else.**
- 120 Dario: I'd like to add onto Amin. If someone is from another place, they can still be American but they don't have the right to treat them a different way.

In lines 116 and 120, Dario uses an explicitly taught sentence frame to engage in collective thinking (“I would like to add onto what X said . . .”) to link what he is about to say to something that a classmate has already said, taking on a more dialogic stance with his peers. Dario frames his comments by explicitly naming the person and idea to which he is responding. Dario takes on a different register, particular to using language in a dialogic, exploratory talk setting, as he and his peers discuss a complicated issue open to multiple interpretations. I present an example of Dario’s earlier talk (January 13) to exemplify the shift in Dario’s talk at two points in time.

- Line Speaker: Discourse from January 13
- 16 Dario: ‘March in Washington for jobs and freedom.’
- T: What else?**
- Dario: Equal rights.
- 17 **T: Are people asking for airplanes, bridges, and spaceships? No. What are they asking for?**
- 18
- 19 Sargis: Equal rights.
- 20 Dario: Jobs.

Moreover, the above exchanges not only exemplify how the EL students were using these language items more frequently over time, but also shed light on a difference among ELs and their English proficient peers. In general, EL students began producing these language items in early March whereas, as evidenced in the transcripts and described as an emerging pattern in my memos, many of their peers began using some of this language in early February. In other examples from more mature transcripts, we see EL students also use variations of the explicitly taught academic language (rather than the exact language taught) to communicate.

- Line Speaker: Discourse from March 24
- 101 Ian: All the debris after a while it affects the ocean line and it would travel to our beaches eventually.
- 102 **T: Okay who can paraphrase what Ian just said? Who can say what he said in his own words because I think that was important. Somebody we haven't heard from maybe.**
- 103 Claire: What is paraphrase?
- 104 **T: Put it in your own words. Say what he said with different words. Can somebody say what Ian said in their own words? Okay yep, Sargis?**
- 105 Sargis: Can you repeat what he said?
- 106 **T: Good, can you repeat what you said Ian, real quick?**
- 107 Sargis: People probably didn't know what he said.
- 108 **T: Exactly why we ask you 'what did so and so just say in your own words?' It's important that you have something interesting to say, but also, you're all learning from each other, so it's important to *listen*. Ian, can you repeat what you said?**
- 109 Ian: That the debris from Japan would affect ocean life and it would travel on to our beaches.
- 110 Sargis: Oh I know, he means that if the trash gets in our waters then that may have pollution our waters and a lot of animals in the waters might die or paper and stuff might block off homes that the animals live in.

Sargis voluntarily asks for the repetition of a comment made by his peer, Ian. He acknowledges on his own that he did not hear what his peer had said and needs to have

the comment repeated before he can paraphrase. After Ian repeats his comment in line 109, Sargis starts his paraphrase with a variation of the explicitly taught language: “I know, he means . . .” Nonetheless, this example shows how ELs are also producing variations of the explicitly taught language to communicate more effectively with their peers.

In the next exchange, we see Fatima producing variations of the explicitly taught language to engage in collaborative talk with her peers more effectively. In lines 83, Fatima expresses, “I don’t know what she said,” in response to the teacher using the Think with Others move in line 82. After Layla repeats her original comment in line 85, Fatima builds on her peers’ comments in line 88, prefacing her idea with, “like what Ben was saying,” which is another variation of explicitly taught language.

- Line Speaker: Discourse from April 28
- 82 **T: We don’t have a lot of time for that question, but who wants to add to what Layla said?**
- 83 Fatima: I don’t know what she said.
- 84 **T: Can you repeat what you said?**
- 85 Layla: It’s a win for people because celebrities help other people like for water or because they’re sick but also if it helps the celebrities’ career since people also think they’re nicer.
- 86 Fatima: So, for example, like, um, celebrities they have all these things. Like they have lots of money and all this stuff and it’s good to show respecting people who don’t.
- 87 **T: Could you tell me more about having respect for people. Can you explain that a little bit more?**
- 88 Fatima: For example, you can give them water like what Jay-Z is doing and like what Ben was saying, you can do that.

The following exchanges were drawn from mature whole class discussions on May 5 and May 19, exemplifying how ELs produced the explicitly taught language with more frequency over time. At this point, the EL students had received much exposure to

and practice with the specialized language for discussions. Moreover, from this point on, each student participant was provided with an academic language cheat sheet containing all of the language functions and corresponding academic language that they had been taught and had practiced over the course of the study, as well as the different types of discussion contributions they could make (see Appendix D). Teachers encouraged students to review the cheat sheet before the discussion and to use the cheat sheet (which was placed on each student's desk) as a reference during the discussion.

Line Speaker: Discourse from May 5

74 **T: Okay, so you're a hands-on learner. Maybe you're a girl and you're fidgety, so what if you're put in an all girls school, and you have the fidgets? You might not fit into that context. Okay, good point. Does anyone want to add to that? [crosstalk]. Yes.**

75 Sargis: Adding to what Amin said.

76 **T: Okay.**

77 Sargis: So, I agree with Amin, that like for example, it's an all boys school, and like the other boys need a fidget or something to help them focus. Maybe not one specific boy might not need it. Maybe he doesn't need anything.

78 **T: Okay, so single gender schools may lead to stereotyping.**

79 Ian: I actually agree with Ana. Some boys need to fidget, and also some girls need to. Some boys don't even need to fidget, because they're focused on it.

...

Line Speaker: Discourse from May 19

39 **T: So what I'm hearing is, for emergency situations a cellphone might be a good thing. But on a different level, a lot of you are saying it might disrupt learning, what the teacher's trying to do. Okay, you had a point.**

40 Amin: Or, I'm trying to clarify, what I'm saying is, like, you can have certain surprises happen but, we should like have a thing for school like you can only use your phone three times a day. Once in the morning so you can clear with your mom or tell your dad, 'I'm okay.' Or once in the middle like, or at the end of the day...

41 **T: So this idea that, Can somebody explain what Amin is saying when he says about three times a day, being able to use your phone? What's Amin trying to say? Phones need, Ana, what's Amin trying to say?**

42 Ana: Um, he's saying like you would need a limit to how many times you can use your phone.

In these exchanges, both Sargis and Amin use academic language to frame their ideas and responses to their peers.

In summary, in addition to teachers continually teaching, modeling, and scaffolding academic language, it was important that they also provided students with multiple opportunities to practice applying these linguistic functions and structures in meaningful ways. Qualitative analysis indicated that ELs needed more time before they took ownership of this explicitly taught language; nonetheless, over time, they too used these expressions with more frequency, and they also developed their own ways of expressing the moves and language functions.

Claim 4: Increased Opportunities Engaged in APT and Practice with Academic Language Functions Fosters Student Autonomy Over Time

Another pattern that emerged through the qualitative memoing process is that, similar to the trends in whole class discourse, ELs also exercised greater agency as participants in dialogic discourse without being prompted over time. However, in general, qualitative analysis also revealed that the EL subgroup needed more time before they began demonstrating increased independence when compared to the trends of the whole class discourse. Below, I present exchanges that exemplify ELs increased autonomy over time.

In the following excerpt from March 31, we see an example in line 15 of Amin adding to something Max had said and also raising a new inquiry without being directly prompted to do so.

Line Speaker: Discourse from March 31
10 T: Anybody else have anything they want to share about what their

- impression of this plane was? Yes?
- 11 Max: Pretty cool.
- 12 T: Tell us more, what makes it pretty cool?
- 13 Max: It says it's almost as heavy as a van in the video. Usually planes aren't like that, that light. They're usually a lot heavier.
- 14 T: Okay
- 15 Amin: I want to add to Max because I agree with you because the plane was only two tons but regular day planes are 63. They're very heavy but I'm wondering how, I know it had propellers but I'm wondering how, I'm wondering how the solar panels don't burn up from the heat? That's what I'm wondering.

In the next transcript from May 19, we see another example of two ELs initiating moves without being prompted to do so.

- Line Speaker: Discourse from May 19
- 39 **T: So what I'm hearing is, for emergency situations a cellphone might be a good thing. But on a different level, a lot of you are saying it might disrupt learning, what the teacher's trying to do. Okay, you had a point.**
- 40 Amin: Or, I'm trying to clarify, what I'm saying is, like, you can have certain surprises happen but, we should like have a thing for school like you can only use your phone three times a day. Once in the morning so you can clear with your mom or tell your dad, 'I'm okay.' Or once in the middle like, or at the end of the day...
- 41 **T: So this idea that, can somebody explain what Amin is saying when he says about three times a day, being able to use your phone? What's Amin trying to say? Phones need, Ana, what's Amin trying to say?**
- 42 Ana: Um, he's saying like you would need a limit to how many times you can use your phone.
- 43 **T: Is there a vocabulary word that you can think about. What's that word? Phones need...**
- 44 Victor: Limitations?
- 45 **T: What was the vocabulary word?**
- 46 Ana: Regulations.
- 47 Sara: I think that, you should be able to use your phone but you shouldn't if you're taking a test or. You should be able to ask for your phone if you're doing a project or need to look up something need to call your parents or um like --
- 48 Fatima: I also think that should be able to have phone, just not during tests, but if there is an emergency or I think, that um, because if it's something that

parents need to talk to you, then you should.

In line 40, Amin “clarifies” something of his own initiative. In line 47, Sara shares her perspective on whether there are appropriate times and contexts for phone use in school. Fatima then responds directly to Sara in line 48 and appears to partially agree and disagree with Sara’s point. She begins with, “I also think . . . ,” suggesting that she is linking her idea to Sara’s perspective. Although these types of exchanges appear with greater frequency among the non-EL students at this point in the study, the EL students also appear to be sharing opinions and collaborating with their peers without the teacher’s involvement. This exchange suggests that although EL students continued to benefit from the scaffolding provided through the use of talk moves, over time they also exercised greater agency as participants in dialogic discourse. This shift in their talk may be attributed to the increased exposure to and practice with academic language functions or the weekly practice of participating in discussion with APT goals forefronted—or more likely, a combination of the two.

Other Claims

The findings I have discussed were basically the same across the EL and non-EL subgroups, except for the differences that I have addressed. The findings I address in this next section are based on patterns that were particular to the EL students; that is, they do not have a parallel among the non-EL students. In examining the data through the EL lens, another finding emerged from the qualitative analysis that was distinct and unrelated to the first four findings, which also pertained to the whole class discourse.

Claim 5: APT Moves Shape Opportunities to Connect New Learning With ELs’

Prior Knowledge and Experiences

Qualitative analysis showed that ELs appeared to be more likely to talk, reason, and negotiate meaning with their peers in the discussions (or episodes within discussions) in which the topics being discussed were culturally relevant to them. At the same time, with the aid of Expand, Dig Deeper, or Think with Others moves, English learners could draw on their background knowledge. These moves frequently created opportunities that led ELs to draw on their experience from life and schooling, letting them link this background to the new concepts they were learning and use language in meaningful ways. In particular, Expand moves and Think with Others moves appeared to welcome students to draw on their background knowledge, and ELs’ voices appeared more concentrated and enlivened in these episodes.

The following exchange from January 27 exemplifies how introducing Expand moves in the early part of the intervention also shaped opportunities for ELs to draw on prior knowledge and personal experiences and to use language in meaningful ways. In this exchange, the teacher asks the class to draw connections between the text and the course theme:

- Line Speaker: Discourse from January 27
- 58 **T: So can you connect back to this theme? Was it your responsibility to make sure that someone communicated? Was it that person’s right to communicate? Was it a rule that everyone--**
- 59 Ss: It was a responsibility.
- 60 **T: Whose responsibility? Tell me more.**
- 61 Aisha: We were responsible for, well it was his classmates’ responsibility because, no, actually, it was a right. I’m not sure because we didn’t have to, but we wanted to be his friend, and to be a good friend, we wanted to like find a way to communicate with him.

- 62 **T: Okay, Amin?**
63 Amin: I have another real-life connection.
64 **T: Okay, say more and speak to the group please.**
65 Amin: When I was in Iran, I was only seven. There was a kid from America, he only spoke American. The teacher only knew little bit of English, but I knew the most English in the class, so many kids were like, didn't even know what he was trying to say, he was trying to ask for. When he was going for lunch and he asked for like a sandwich, the lunch lady didn't know what to do. I wasn't there when that happened, but the next week when I was there, I realized he was speaking American and then I like taught him the ways to speak Persian.
- 66 **T: So it was your responsibility. Do you think the American kid felt isolated?**
67 Amin: Yes, there was no other kid that spoke American.
68 **T: That spoke English to him.**

In response to the Expand move, Amin produces a much more elaborated turn in comparison to his turns in the baseline transcripts. In line 60, the teacher uses the Expand move to encourage the students who called out “responsibility” to say more. First, in line 61, Victor (a non-EL student) responds, and then in line 65, Amin (the EL student) responds with a personal connection to the question in focus by giving an example of how he witnessed a student feeling isolated in his previous school and took responsibility as a classmate to communicate with and help the student. In this response, Amin exemplifies why it is everyone’s responsibility to ensure that the school environment is an inclusive one. His turn is longer than turns in the baseline transcripts (comprising both compound and complex sentences), and he provides a reasoned response, as evidenced in his use of analyzing/generalizing words, such as “but.” Though Amin makes some errors in language use (e.g., “spoke American”), his errors do not impede communication or detract from his meaning. More important, he has the space to exemplify and elaborate a previously made point. The focus is on integrating and expressing personal experiences

and background knowledge with fluency in order to make sense of the text through meaningful dialogue, not on producing error free English. Not to mention, by articulating his idea, the whole class is exposed to his diverse perspective in which he witness the reverse of his current experience: an American who did not speak Farsi and was somewhat isolated and marginalized in a school in Iran.

In the following example from March 10, we see again how Amin in particular draws on a prior personal experience when encouraged to “dig deeper” and “expand.” Students had been discussing how even though the speaker of the poem “I, Too, Sing America” appears to have no choice but to accept the injustices in America, he responds with both defiance and pride and does not allow racism to define him.

- Line Speaker: Discourse from March 10
- 55 **T: Ah, so you’re saying he cares but he’s staying strong. He has no, choice but to accept the situation, but remains strong.**
- 56 **T: Can you point to anything in the text or elsewhere that you could use as evidence for that? Or anyone? Is there anything you could point to in the text, using those examples. For example, for instance. Amin**
- 57 Amin: I was going to say something about, so in 2011 when I first came to America with my family, we didn’t have a dining room table, we sat on the floor and ate our dinner.
- 58 **T: Okay, so you’re making a connection between the poem and your personal life? Say more.**
- 59 Amin: Because I was very confused, what is this new world that we’re in, I was only five at the time and I didn’t know where we were because this wasn’t our old house, we didn’t have our own dining table, we didn’t have our T.V., we were just sitting down in a kitchen, with hard cement, cold floor, eating eggs.
- 60 **T: Where did you move from?**
- 61 Amin: Iran.
- 62 **T: So from Iran and now you’re in this new country, in a new home and you’re in a kitchen, and you felt kind of separated from your environment, similarly to the way this writer’s feeling, is that what you’re saying?**
- 63 Amin: Yeah.

The teacher uses a Dig Deeper move in line 56 to get students to reason more deeply with text-based evidence, but Amin responds with an example from his personal life, as seen in line 57. In line 58, the teacher uses the Say More move to encourage Amin to “expand” more, and he does so in line 59. In lines 59, Amin draws a connection between his personal experience as a newcomer in the United States and the experience of the speaker in the poem, drawing a link between his background knowledge and new learning. Amin appears to identify with feeling disconnected from home (Iran) and not feeling fully integrated into the new society. Moreover, Amin once again shares an interesting personal connection that allows his classmates to hear and be exposed to a diverse perspective.

In the following example from the March 10 transcript, we see how Fatima, Dario, Sargis, and Amin become more engaged as the topics related to identity resonate with them in particular, and the talk of ELs is more concentrated in this episode. Students are still discussing Langston Hughes’s poem, “I, Too, Sing America” and the topic of what it means to be “American” arises.

- Line Speaker: Discourse from March 10
- 103 **T: To wrap up, it’s interesting how the poet repeats two phrases, ‘I, too, sing America. I, too, am America.’ And that links to what we’ve been talking about citizenship, rules, rights and responsibilities. What exactly does the author mean by this phrase? Why is it repeated? How does it link with our theme? ‘I, too, am America.’**
- 104 Fatima: I think it means that ...
- 105 **T: Can you speak up?**
- 106 Fatima: I think it means that other people, like, are the same
- 107 **T: Who can add, we haven’t heard from you Sargis, tell us how is this related, ‘I, too, sing America, I am America?’**
- 108 Sargis: He’s probably says when I say ‘I, too am America’ he is American, so they should treat him equally.
- 109 Dario: I think he’s trying to say, he is American, so why can’t he get treated

- like everybody else?
- 110 Victor: I was going to say that.
- 111 **T: Just build on what Dario said then.**
- 112 Victor: America wouldn't be a country without people, so he's also part of America, he deserves to be treat just as everybody else is. Because without its people, America would just be a name, it wouldn't be an actual country.
- 113 **T: Right, so he's saying, I have the right to feel patriotic, I'm just as American as anybody else, is that right?**
- 114 Ian: I want to add on to what Dario said and Victor that we're all from America, we're all people no matter where we're from, if we're in America, we should all be treated the same. We should all get equal rights and if we're in America, no one should be treated differently. We're all people.
- 115 **T: Okay, so that's a great connection to our theme, would you like to add to what Ian said?**
- 116 Dario: I would like to add on to Ian. It's not fair that if you're American, and if other people, and you don't get treated the same way, because you guys are both the same there's no differences between you.
- 117 **T: Final comment to add to Dario, Amin?**
- 118 Amin: Because, maybe if he's not American, but maybe he's African American, or maybe he's Indian, or another person. But he can still be an American, and he can be talking like he's not an American, but he can still be an American citizen, he's just from a different country. Other people use him as a slave but he is still American, but other people might not know.
- 119 **T: Okay, so you're going back to last week, we said the only true Americans are Native Americans. Everybody's from somewhere else.**
- 120 Dario: I'd like to add onto Amin. If someone is from another place, they can still be American but they don't have the right to treat them a different way.

In this passage, all the ELs (Amin, Sargis, Dario, Fatima) really take to the topic of what it means to be an American in a culturally diverse society as shown in lines 106, 108, 109, 116, 118, and 120. Together with the aid of various talk moves used to sustain and deepen discussion and collaboration, ELs appear to be more likely to talk and engage in reasoning-based discourse when they are afforded the opportunity to draw on their own funds of knowledge, and this pattern repeats throughout the study.

Summary

In brief, quantitative and qualitative analysis focusing on ELs revealed that generally, shifts in talk for ELs were similar to those of the whole class discourse, with a key difference being how ELs were afforded additional benefits and opportunities for second language development. As the instructional discourse shifted from an IRE-facilitated focus on correct responses to the elicitation of individual and collective students' thinking, ELs had opportunities to (a) practice speaking and listening to the English language in an authentic disciplinary context; (b) develop and express their reasoning in conjunction with language development (Walqui & Heritage, 2012); (c) interact with peers who were more proficient English-language users in an inclusive and equitable learning environment; and (d) gain increased autonomy as discussants in an “academically productive” discourse setting, in which the academic norms for participation might have differed from those in students' previous cultural and academic settings.

As an important reminder, all Friday discussions were also regularly scaffolded (for the whole class) in the sense that prior activities (e.g., content-related vocabulary development, small group work comprehension questions, activating background information tasks) were built into each lesson (see Table 2) before whole class discussions. Given this set up and the fact that the English language proficiency of these ELs was relatively high (“developing” or “expanding”), ELs did not appear to need much additional scaffolding in comparison to the non-EL participants, aside from increased time, support, and practice participating in dialogic discourse with instructional talk

strategies before they became more autonomous discussants. In addition, ELs appeared to need more time for explicit instruction, various forms of language support and scaffolds, and opportunities to use academic language in context. Students appeared to produce these explicitly taught language items (as well as variations of the explicitly taught language), more often, and use of these language functions in tandem with APT moves may have also supported their agency as speakers. Simultaneously, there was a shift in register as students in general became more socialized to the norms and language mores of participating in student-centered, collaborative discourse. Finally, ELs appeared to be more likely to talk, reason, and negotiate meaning with their peers in the discussions (or episodes within discussions) in which the topics being discussed were culturally relevant to them. APT moves appeared to shape opportunities that led ELs to draw on their experience from life and schooling, allowing them to link this background to the new concepts they were learning and use language in meaningful ways.

CHAPTER 7:

CONCLUSION AND DISCUSSION

The purposes of this DBR study were (a) to understand the challenges associated with engaging culturally and linguistically diverse learners in whole class, collaborative discussions (as described in the Common Core anchor standards CCSS.ELA-Literacy.Sara.5.1) in a mainstream fifth-grade classroom; (b) to address those challenges by codesigning a learning environment informed by preexisting design principles and research-based practices; (c) to determine whether the codesign resulted in shifts in talk for the whole class, with an additional focus on the talk of English learners; and (d) to refine design principles, based on the study's findings, which can be adapted for use in similar contexts.

To conclude this study, in the following chapter, I begin by revisiting the design principles that guided the classroom work. I then review the claims made for the whole class and for English learners, showing how they build on the initial design principles and relate to the literature on second language development; I review my claims within my discussion of each design conjecture. Next, I examine the design within a larger, complex system, considering other pieces of the design that were outside the scope of this investigation, but which point to areas for future research as well as other considerations for educators who apply these design principles in other classroom contexts. Finally, I conclude with a discussion of the significance of the study and its limitations.

Review of Design Principles and Main Claims

Design Conjecture 1: Using APT to Support Collaborative Discussion

Building on the research of Michaels and O'Connor (2011), we conjectured that by implementing the four "Academically Productive Talk" goals, my codesigners and I could support both English proficient students and EL students in moving away from the more typical IRE sequences and toward extended, reasoning-based, collaborative discourse. We implemented Michaels and O'Connor's (2011, 2012) four talk strategies systematically, along with the corresponding nine talk moves, designating which one of us would be responsible for using specific talk strategies in each discussion. In this way, we ensured that all four talk strategies were implemented and that we each had opportunities to experiment with the various strategies. We layered in the talk strategies one at a time until all the goals has been introduced. We then turned to each of us using all four talk strategies to support productive talk among students as deemed necessary. We approached this piece of the intervention in this manner because we were interested in understanding if and how each strategy supported shifts in talk for the whole class, as well as how those shifts played out for the subgroup of ELs. Moreover, this approach was helpful for tracking and discerning relationships between our actions and the results detected in the data.

In Chapters 5 and 6, I explored how implementing the talk moves in this way might have supported shifts in whole class discourse, and then I concentrated on the talk of English learners in order to determine if the claims for the whole class also held up for the EL subgroup. In general, analysis revealed that shifts in talk for ELs were similar to

those of the whole class discourse, with a key difference being how ELs were afforded additional benefits and opportunities for second language development.

Claim 1: Specific talk moves and talk moves in conjunction with each other support reasoning-focused, collaborative discussion. After the codesign was implemented, the following two patterns and relationships across patterns emerged from the qualitative and quantitative analyses for both the whole group and the EL subgroup. First, teachers' explicit and frequent use of the four APT strategies appeared to be an important support for moving beyond traditional IRE exchanges toward interactions in which students produced extended, reasoning-focused, collaborative discourse. Second, by purposefully shifting and navigating all four types of strategies, teachers appeared to play an important role in sustaining deeper thinking and a meaningful, collaborative exchange of ideas. In other words, using the talk strategies was not as simple as it initially appeared to the designers. Using the talk moves involved some strategic thinking and application; it was necessary to push one student's individual thinking and reasoning with Expand and Dig Deeper moves before other students could build on that talk in a reasonable and relevant way. Additionally, it was necessary to establish the importance of peer listening by holding students accountable to what others had said with Listen/Repeat moves (as we had emphasized in the early part of the intervention) before focusing on Thinking With Others talk strategies.

Moreover, though the use of APT strategies appeared to require skill and strategic application, it simultaneously became evident that recognizing these moves as "tools" from which teachers could consciously and frequently draw during a discussion was key

to using the strategies to enact dialogic discourse successfully. Although it may have appeared at first that the use of talk strategies was something that all teachers “just do anyway,” over the course of the study it became clear that the conscious and frequent use and referencing of these talk tools (each discussion facilitator carried a set with his or her designated moves highlighted for that day) alleviated much of the effort that is often associated with sustaining adequate participation and a reasoned exchange of ideas among all students in discussion settings.

Furthermore, recall how in the baseline transcripts, competing learning goals took precedence, resulting in teachers purposefully guiding the talk in a specific direction, such as to make an instructional point or to introduce a concept that students are unlikely to discover on their own (Mortimer & Scott, 2003). It became evident over the course of the study that IRE exchanges did not completely disappear from the transcripts, as these exchanges were sometimes necessary for enhancing the quality of the discussion; for example, teachers at times used IRE in tandem with APT moves when it was necessary to draw attention to and clarify the meaning of particular academic words in the midst of collaborative exchanges among students. This suggests that oversimplifying dialogic and authoritative discourse as separate and/or competing types of discourse can be problematic—as teacher-led collaborative discussion might sometimes comprise a balance of authoritative and dialogic discourse (Scott, Mortimer, & Aguiar, 2006). However, having said that, as teachers consciously implemented APT goals, this appeared to support the process of firmly aligning the instructional discourse to the stated overarching goals (as described by the CCSS)—which were to promote a learning

environment where students are reasoning and engaging with each other's ideas and for addressing the challenges stated in the Needs Assessment.

Furthermore, Claim 1 had an additional layer of meaning when examined in light of the literature on second language development. First, teachers' explicit and frequent use of the APT talk strategies nurtured second language development in that ELs had increased opportunities to produce and receive comprehensible input in English, thus promoting interactions (Krashen, 1987; Pica, 1987, 1994; Swain, 1985, 1995). EL students also had more chances to use language to express complex thinking and reasoning, integrating both language and cognitive development (Heritage, Silva, & Pierce, 2007; Walqui & Heritage, 2012), and to experience language as "action" and as situated in meaning—rather than language in isolation from the context of meaningful and engaging academic work (van Lier, 2004; Walqui & Heritage, 2012). In addition, I found that Listen moves and Think with Others moves, when used in tandem with teachers' conscious and inclusive mediating, appeared to play a key role in giving ELs increased opportunities to interact with peers of higher English language proficiency, a critical aspect of fostering linguistic competence (Clegg, 1996; Vygotsky, 1987). These two moves further supported integration and inclusion in the mainstream classroom while also affording EL students access to the same learning opportunities and high-quality instruction as their English-fluent peers (Hawkins, 2005; Kinsella, 2005; Zwiers & Crawford, 2011).

Claim 2: APT strategies support collective thinking, which further support reasoning. When examining reasoning word usage patterns in the data, it became

apparent that increasing the exposure of multiple, diverse students' ideas played an important role in promoting individual reasoning among EL and non-EL students alike. As teachers used the APT strategies (Listen and Think with Others moves) that led students to consider and react to others' ideas, students' own ideas also became more reasoned and cogent.

Examining this finding through the EL lens sheds light on the importance of collaborative talk and interactive sense-making for strengthening reasoning and complex thinking, which in turn supports second language development (Boyd & Kong, 2017; Heritage et al., 2007; Rogoff, 1990; Soter et al., 2009; van Lier, 2004). The more that ELs engaged in collective thinking, the more they articulated their own reasoning about the content and concepts they were learning.

Further, this finding also suggests that in the context of EL instruction, teachers should pay attention to fostering and scaffolding the language necessary to participate in sustained, reasoning-based discourse. In this setting, it was important to understand and acknowledge positioning/claiming, speculating/proposing, and analyzing/claiming reasoning words (conjunctions, modals, and adverbials that signal reasoning such as *think, agree, because, so, would, could, might*) as another key facet of academic language. As the interaction patterns shifted in the classroom, students were presented not only with opportunities to engage in reasoning, but also with opportunities to use and gain experience with language common to reasoning about the content they were learning (MacDonald et al., in press).

Design Conjecture 2: Supporting Academic Language

For this second design element, we drew on the sociolinguistic component of Scarcella's (2003) framework for academic language and focused on scaffolding the language functions and structures relevant to making contributions and communicating with others in discussions. We conjectured that scaffolding and explicit teaching of academic language (sentence stems) to complement the APT talk strategies in discussion contexts would facilitate students' participation in reasoning-based, collaborative discourse (Kinsella, 2005; Zwiers, 2008). We also hypothesized that if given repeated exposure and opportunities to practice in a contextualized APT talk setting, students would begin using the language in context with more frequency (Marzano & Pickering, 2005; Schmitt & Carter, 2000).

Through multiple iterations, the teachers implemented this academic language in a variety of ways, including offering student-friendly definitions and examples, modeling the use of the functions prior to discussions, posting sentence strips with language functions on the classroom board, providing handheld index cards and an academic language cheat sheet for students to consult during discussions, and offering friendly reminders to use the language during discussions. The academic language cheat sheet developed for this project provided sentence starters (linguistic examples) for the various types of contributions students could make in a discussion, serving as a metacognitive framework for students to use in their responses to APT prompts and their peers' ideas.

Claim 3: Multiple Opportunities to Practice Language in Context Supports Engagement with Academic Language and Registers. By explicitly teaching,

modeling, and providing *multiple* opportunities to practice using these linguistic functions in an authentic and “productive” discourse setting, teachers supported all students, including ELs, to use these specialized language functions more frequently and to engage with the language register of dialogic discourse. Moreover, although productive discussion goes deeper than any set of linguistic features (e.g., quality of the ideas put forth and the frequency of students’ responding to each other), equipping students with the language for expressing these higher modes of thinking with their peers in clear, organized ways appeared to be important for all students. However, as I explored in Chapter 6, a pattern from the memos revealed that compared to the rest of the class, ELs needed more time and scaffolding (e.g., practice and explicit instruction) before they began producing the language functions. This suggests that ELs may need more time to develop the language mores and interactional competence necessary to participate in the social and cultural context of their new classroom environments.

In light of academic second language development, this finding relates to the literature because ELs became more adept in navigating relevant school language. This finding is important because it supports the idea that proficiency in academic language is a form of linguistic capital that “has to be developed through pedagogical training in the school” (Kanno & Kangas, 2014, p. 853). This sheds light on one approach teachers can use to help bridge the gap between the language with which EL students are familiar and the relevant school language they will be required to understand and use in academic settings; it also helps teachers provide support for that development in the context of that activity (Bunch et al., 2012).

Moreover, fostering opportunities for this particular facet of academic language development appeared to be a vital condition for supporting students in developing the linguistic resources with which to navigate academic discussion settings. Walqui and Heritage (2012) argued that “skilled language users vary their use of language depending on the context and on their purposes, employing different registers and genres as communicative resources” (p. 5). However, as supported by this study, to acquire these language skills students need opportunities to participate in interactions where they are asked and expected to produce these language features in contextually appropriate ways. For all teachers, and for teachers of English learners in particular, it is important to assist students in navigating the language variety and communicative practices associated with engaging in reasoning-focused, collaborative discourse.

Claim 4: Increased Opportunities Engaged in APT and Practice with Academic Language Functions Fosters Student Autonomy Over Time. Although data indicated that in this particular classroom context, students were not ready to engage in “productive” discourse on their own without the aid of instructional scaffolding (talk strategies) or academic language supports, both EL and non-EL students appeared to gain autonomy as discussants over time. In other words, there was evidence (both qualitative and quantitative) of students sharing, clarifying, exemplifying, and engaging with others’ ideas without always being prompted to do so after having multiple opportunities to engage in “academically productive talk.” It was unclear, however, if this shift in autonomy was supported by the instructional talk moves or by repetitive scaffolding of academic language functions. It appeared that both played a joint role in fostering

independence; students needed practice participating in “Academically Productive Talk” to become familiar with it before eventually taking on more responsibility for the quality of this kind of talk. Additionally, the language appeared not only to foster this particular language use, but also to support students in exercising their agency as speakers.

Recent literature focusing on academic discourse places emphasis on strengthening students’ linguistic expressions of complex thinking so that students can become critics and communicators of ideas across disciplines. Students, however, need to be supported in acquiring the linguistic structures (e.g., “I agree with you, and I can add that . . .” “May I suggest a couple of other ideas? One example I can offer . . .”) needed to take on these roles and to enact these academic tasks—such as posing questions, exploring different points of view, and building meanings with others (Zwiers, 2008; Zwiers et al., 2014).

Another emerging pattern in the memos suggested that the ELs in this classroom needed more time than the class as a whole before they became more independent as discussants in “productive” discourse. This pattern makes sense because EL students might have had the additional challenge of acclimating to different discussion norms in a new cultural and academic discourse community while also developing their agency as speakers in a new language (Bunch et al., 2012; Gee, 2005; Pennycook, 2000). Thus, teachers should go beyond surface-level inclusion to provide equitable learning opportunities for culturally and linguistically diverse students and ensure that EL students are provided with the appropriate time and support to bridge existing skills with the development of new ones (Cummins, 2000).

Additional Refinements and Design Principles

Claim 5: APT Moves Shape Opportunities to Connect New Learning With ELs’

Prior Knowledge and Experiences

Research indicates that learning builds on *all* students’ prior knowledge and experiences (Bransford, Brown, & Cocking, 2000) and this was affirmed in this study in the way that *all* students drew on personal experiences in order to make sense of the topic being discussed in weekly discussions, and the use of APT moves appeared to support these opportunities. As I explored in Chapter 6, however, ELs in particular seemed to participate more when APT talk strategies were used in tandem with culturally or personally relevant topics (e.g., cultural identity, bias, what it means to be “American”), allowing students to draw from prior knowledge and verbalize their experiences to connect what they already knew with new learning (Gay, 2000; Moll & Gonzalez, 2004). This relates to the literature on second language development because research shows that beyond giving students the chance to read, write, speak, and listen to English in the context of subject matter learning, teachers must also give students opportunities for meaningful language use, in which students draw on their rich experiences (Echevarria et al., 2017). Moreover, dialogic discussions are especially beneficial to students from non-dominant backgrounds because they build a bridge between students’ prior knowledge and disciplinary knowledge (Wells & Arauz, 2006). This finding sheds light on how the use of APT strategies can create conditions under which students can express their thinking and build on prior knowledge, which in turn supports learning and language development. Additionally, in doing so, *all* students reap the benefits of learning in

culturally and linguistically diverse classrooms, such as perspective-taking, critical thinking, cross-cultural understanding, and reduced stereotype threat (Banks, 2010; Fowers & Davidov, 2006; Gay, 2000; Gunderson & D’Silva, 2014; Harklau, 1994; Lantolf, 2000; Mahiri, 2017; Pettigrew & Tropp, 2008; Walqui, 2006; Yoon, 2007).

Seeing This Design Within a Complex System: Considerations for Implementation and Future Research

In this section, I identified potential issues that other educators might consider if implementing similar interventions in other classroom settings. I realize that there are different variables at play in different classroom environments that one would have to consider. I will also briefly consider how other pieces of the design that were beyond the scope of this study may have supported shifts in discourse and paved potential avenues for future research.

The Exact Nature of Supports Will Vary

It is important to note that the teachers in this classroom implemented particular supports. First, the teachers of this class prepared and delivered well-structured, scaffolded lessons leading up to the whole class discussions (e.g., activities to activate background information, content-specific vocabulary work, guided comprehension questions; and engaging discussion prompts that built on a common theme). Second, the EL teacher circulated among the EL students and supported them in their independent/small group work. Moreover, the ELs in this class had enough proficiency in English to express their ideas fluently, albeit sometimes with “imperfect” English, and to use expanded sentences when engaging in oral interaction. Having said that, however,

the exact nature of supports will vary according to varied educational backgrounds and specific academic and language needs of the EL students in each class. Additional scaffolding in a differentiated learning setting can include translanguaging practices (i.e., allowing for discussion in students' L1 prior to whole class discussion), assessing students' background knowledge on a topic and building contextual or historical knowledge in texts with which ELs may be unfamiliar, direct vocabulary instruction, explicit grammatical instruction that facilitates students' capability to talk about text in complex ways (e.g., conditional forms and functions), explicit instruction of challenging phonological aspects of language, and reading comprehension strategies that support students in unpack texts before engaging in text-talk. In sum, the exact nature of supports will vary, and rather than "watering down" the level of thinking and language use in discussions, it is necessary to build scaffolds that afford ELs equitable opportunities to learn and discuss alongside their peers (Carrier, 2005; Daniel & Pacheco, 2016; Goldenberg, 2008; Lawrence-Brown, 2004; Mohan et al., 2008; Zwiers et al., 2014).

Teachers' Conscious Mediating

Patterns that emerged from analysis of the Design Team notes also indicated that teachers were aware of the tendency for English-proficient students to dominate talk in discussion settings (both in this classroom context and in other classroom settings) and that the teachers consciously set a standard of inclusion by inviting all students to participate. This observation speaks to the importance of teachers in discussion-based pedagogical settings consciously acting as mediators and intentionally calling on a diverse range of voices to maintain an inclusive learning environment. In other words, it

may not be enough to implement academic language supports and APT talk strategies; teachers must also be aware of how they position students as valued participants in discussion settings. This can be addressed through conscious moderating, by expecting and requiring extended responses from students developing their proficiency in English, and by valuing and respecting every voice in the classroom.

Teacher Skill and Analytical Stance

Resources like APT goals and moves appeared to be helpful in shifting discourse toward dialogic, reasoning-focused discourse. That said, blindly implementing these talk strategies is not enough to sustain high-quality discourse. For example, implementing Listen and Think with Others strategies to engage students in collective thinking may require teachers to be skilled at listening carefully and connecting students' ideas. In addition, teachers may need to use Expand and Dig Deeper moves in strategic ways so that students produce a range of developed, evidence-based ideas before encouraging a meaningful and reasoned co-construction of ideas. Additionally, without the strategic use of talk strategies, discussion can easily become unanchored from the original text when allowing multiple ideas to seed the discussions. On the other hand, teachers might also struggle to create a dialogic exchange of ideas when primarily pushing students to rely on data and evidence to support claims as you may recall was evidenced in the baseline transcripts of this study.

In general, teachers' abilities and level of consciousness with regard to the facilitating discussions may vary in other classroom contexts. In other words, teachers may need varying degrees of support to navigate these important components of

productive talk. This may require professional development opportunities that help teachers use, examine, and reflect upon their use of various discursive strategies in order to adopt an analytic stance on their own role in facilitating discussion.

Reconceptualizing How EL Students Develop Language

Teachers who wish to implement these strategies in similar classroom contexts may need to reconceptualize how EL students develop their language skills. In other words, teachers working from a “language as accumulation” perspective are likely to focus on overcorrection and grammatically correct language, which can hinder ELs’ language production and interrupt the flow of ideas. From this perspective, language is perceived solely as a set of rules or discrete elements that EL students have to master before they can participate fully in school practices. In the action-based perspective of language development, however, ELs learn language as they learn, think, and communicate about the content in meaningful and situated contexts (Walqui & van Lier, 2010). It is through the interplay between active language use and meaning-making of the content in focus that strengthens students’ abilities in both domains (MacDonald et al., in press). Moreover, with appropriate supports, ELs are able to engage in practices called for by the Speaking and Listening standards while using language that is still in the process of development.

Opportunities for Contextualized Language Instruction and Assessment

In the same way that academic language functions were explicitly taught and reinforced through meaningful and contextualized practice, other relevant academic language instruction can be introduced and reinforced in similar ways. That is to say,

teaching language (e.g., syntactic structures, domain specific vocabulary) may best be achieved when students are provided with both explicit instruction and multiple opportunities to use academic language in a meaningful and authentic context. Productive discussion contexts appear to shape opportunities for students to rehearse other forms of new language and apply it in an authentic, interactive context.

Likewise, these discussion contexts can also create opportunities for assessment. Teachers can determine the kinds of “academic language” or “background knowledge” students need to engage with their peers’ ideas and articulate their own complex thinking while also leveraging students’ existing linguistic, cultural, and knowledge resources in ways that benefit all learners.

Incorporating Student Self- and Peer Assessment

Although this line of inquiry was beyond the scope of analysis for this study, in this study, we also conjectured that another important principle of supporting productive discourse is through self- and peer assessment. Boud (1995) asserted that self-evaluation encourages reflection on one’s own learning and promotes responsibility, independence, and student ownership of the learning. Peer assessment involves students providing feedback to other students on the quality of their work. Falchikov (2007) argued that peer feedback can encourage collaborative learning through interchange about what constitutes good work. Self- and peer assessments can serve as metacognitive tools that potentially give students an increased awareness of how to participate effectively in critical academic conversations. Productive discussions require disciplined moves, language to support those moves, and student awareness of the range of types of

contributions. It would be worth investigating the role that student self- and peer-assessment might play in promoting productive discourse and autonomy.

Gradual Release of Responsibility to Promote Autonomy

Finally, having more time for the study may have shed more light on how to best support students' independence through the gradual release of responsibility, which is the ultimate goal of any scaffold. In this study, though students appeared to continue to need the supports over the full course of the investigation in order to engage in sustained, reasoning-focused, collaborative discussions, there was a trend indicating that both English proficient students and non-English proficient students exercised greater agency as speakers over time. That is, students responded directly to their peers' ideas and they acted as initiators of ideas rather than only as passive responders with greater frequency over time. Given that the ultimate goal is providing "just enough" and "just in time" in order to eventually "hand over" the responsibility to the students, the use of scaffolds should be perceived as a mutable process based on students' developing needs (Fisher & Frey, 2008). This suggests that teachers should carefully observe and assess discussions in order to determine the level of supports needed with different groups of students and/or the same group of students over time. Self- and peer assessments as well as teachers' analytic stance may be useful in better understanding this path toward greater student autonomy as thinkers, communicators, and negotiators. Regarding this study, this might have entailed an extension of the design and analysis, in order to ascertain what modifications might need to be made to the design in order to foster greater independence over time.

Significance

In light of the new Common Core Speaking and Listening Standards, it is critical for language and literacy researchers to help articulate a fundamental understanding of the development of language and literacy that is relevant to the challenges facing all learners in mainstream classrooms, including those developing proficiency in English. These standards require all students to follow new rules of interaction as they veer away from typical IRE discourse patterns and use language to articulate reasoning, negotiate meaning, build new understanding, and navigate across different social and academic practices. Despite scholars, researchers, and the CCSS calling for increased discussion as a way to support learners in developing school-based thinking and speaking practices, few empirical studies have investigated which instructional scaffolding strategies foster constructive classroom discourse among EL and non-EL students in culturally and linguistically diverse mainstream classroom settings. I sought to address this gap in the literature with this study.

Through this investigation, I have elucidated some of the ways in which APT talk strategies and the explicit instruction and scaffolding of academic language for “productive” discourse can generate shifts among EL students and their peers. My conclusions have underscored the value of supporting reasoning-focused discourse in ways that engage ELs as critical thinkers and sense-makers along with their English proficient classmates. By doing so, we can address educational inequity and help realize the immense potential that diverse groups of ELs bring to our school communities. With the enactment of the new CCSS, pedagogical approaches that increase ELs’ effectiveness

in English while developing their understanding of key concepts are critical. They help ELs—the fastest growing population in U.S. schools—rise to meet the new standards and address the linguistic and academic needs of *all* students in today’s “mainstream” classrooms.

Limitations

I recognize that instruction in real-world settings is involved and complex and that teachers often set numerous learning goals over a period of time. I also recognize that when conducting classroom-based research, these different variables may threaten the internal validity of a study. However, after conducting the Needs Assessment with the teachers, we were able to make clear conjectures, to specify a tentative learning design, and to predict learning outcomes for each element of the design—which then guided the systematic, mixed methods testing of the conjectures in this specific context (Sandoval, 2014). Moreover, I chose DBR as a methodology because it does not try to control conditions, but rather, identifies and accounts for specific changes that occur under certain conditions in real world settings while also addressing questions of genuine interest to both educators and researchers with the goal of developing “usable knowledge” (Lagemann, 2002). By adopting numerous iterations and repeating my analysis throughout the cycles of iterations, I hope to have strengthened the internal validity of the findings of design-based research (Design-Based Research Collective, 2003). I also acknowledge that this study spanned seven months, and further extension of the design and analysis over a longer period of time would bolster the internal validity of this study. Although these limitations must be taken into consideration, I hope that

readers find that the research was conducted with enough rigor that the results seem plausible and valuable to educators and researchers seeking to better understand and support the development and use of language and literacy among ELs and all learners in mainstream classroom settings in light of the new Common Core State Standards in Speaking and Listening.

APPENDIX A

Transcription Conventions for Classroom Data

Transcription conventions are adapted from Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In G. H. Lerner (Ed.), *Conversation analysis: Studies from the first generation* (pp. 13–31). Amsterdam, The Netherlands: John Benjamins.

Simpson, R. C., Lee, D. Y. W., & Leicher, S. (2002). *MICASE manual*. Ann Arbor, MI: English Language Institute, The University of Michigan.

T	Teacher/facilitator/support staff
Amin, Sargis, etc.,	Identified student
Ss	Several or all students at once
--	Interruption; abruptly cutoff sound
,	Brief mid-utterance pause of less than one second
.	Falling intonation contour with 1-2 second pause
?	Rising intonation, not necessarily always a question
...?	Teacher pause that elicits sentence completion
(2 second pause)	Measured silence of greater than 2 seconds
X	Unintelligible speech; each token refers to one word
<LAUGH>	Laughter
()	Uncertain transcription
{ }	Verbal description of events in the classroom
//	Phonetic transcription; pronunciation affects comprehension
[]	Transcription minutes

APPENDIX B

Overview of Data Analysis Plans

Research Question	Data	Analysis Plans/Tools
<p>What are the challenges to facilitating whole class, text-based discussions in culturally and linguistically diverse “mainstream” classrooms at the level?</p>	<p>1) Discussion transcripts (Dec.- Mid Jan.) 2) Notes from Team Design Meetings 3) Notes from Class Observations</p>	<p>1) <u>Discussion Transcripts</u> - (12/16, 1/13) a) Ratio of Student Talk: Teacher Talk b) Analysis of <i>APT Talk Moves</i> (Tool: Table 6) c) Analysis of Students’ use of Reasoning Words: Speculating, Analyzing, and Claiming Words (as indicators of reasoning) (Table 7) d) Analysis of Students’ Explicit References to Other Students’ Contributions (Tool: Table 8) 2) Explicitly vs. Non-Explicitly Taught Academic Language (Table 9) 3) <u>Field Notes</u> - I will refer to the field notes to inform the memoing process to make sense of transcripts and codes.</p>
<p>In conditions where teachers a) implement instructional “talk moves”; and b) explicitly teach sentence stems to support communication and reasoning, how do the discourse patterns of the whole class change?</p>	<p>1) Discussion transcripts (Mid Jan. - May) 2) Notes from Team Design Meetings 3) Notes from Class Observations</p>	<p>1) <u>Discussion Transcripts</u> - (1/20, 1/27; 3/10, 3/24, 5/5, 5/19) a) Ratio of Student Talk: Teacher Talk b) Analysis of <i>APT Talk Moves</i> (Tool: Table 6) c) Analysis of Students’ use of Reasoning Words: Speculating, Analyzing, and Claiming Words (as indicators of reasoning) (Table 7) d) Analysis of Students’ Explicit References to Other Students’ Contributions (Tool: Table 8) 2) Explicitly vs. Non-Explicitly Taught Academic Language (Table 9) 3) <u>Field Notes</u> - I will refer to the field notes to inform the memoing process to make sense of transcripts and codes.</p>
<p>How does the talk of ELs change? In particular, how are shifts similar to or different from shifts seen in whole class discourse?</p>	<p>1) Discussion transcripts 2) Field Notes 3) Surveys and Self-Assessments</p>	<p>1) <u>Discussion Transcripts</u>: (all of the above) a) Qualitative Analysis of shifts EL individual student talk: Amin, Sargis, Dario, Fatima 2) <u>Field Notes</u> – I will refer to the field notes, pre/post surveys, and student self-assessments to inform (further) the memoing process on individual students.</p>

APPENDIX C

Intervention Summary

Date	Text	Implementation of Strategies/Interventions
9/16–11/16		Discussion Friday was a course in progress: It began in September (2016) at the beginning of the academic school year.
12/2/16		Pre-Design Student Surveys
12/16/16	Reader’s Theater	Baseline Talk moves not formally implemented.
1/6/17		Teachers introduce the theme of “Citizenship: Rights, Rules, and Responsibilities” to students. Teachers review the purpose of Discussion Fridays—to think critically about the theme of citizenship through weekly discussion topics related to citizenship. Teachers have introduced some academic language for engaging in collaborative talk.
1/13/17	Other	Baseline APT Talk Moves not formally implemented.
1/20/17	Other	APT Strategy Focus: Expand moves & Listen moves.
1/27/17	Reader’s Theater	APT Strategy Focus: Expand moves & Listen moves.
3/10/17	Other	APT Strategy Focus: Expand, Listen, Dig Deeper, Think with Others moves. AL: Explicit instruction/scaffolding of language for giving evidence, agreeing, disagreeing (sentence strips on white board).
3/24/17	Reader’s Theater	APT Strategy Focus: Expand, Listen, Dig Deeper, Think with Others. AL: Explicit instruction/scaffolding of language for giving evidence, agreeing, disagreeing (handheld index cards plus reminders). Self-Assessment: exit slips for building on each other’s ideas.
4/7/17		Self-Assessment: students conduct self-assessment.
5/5/17	Other	APT Strategy Focus: Expand, Listen, Dig Deeper, Think with Others moves. Academic Language: Explicit instruction/scaffolding of academic language (comprehensive cheat sheet)

5/19/17	Reader's Theater	provided with all previously taught functions and structures).
6/1/17		APT Strategy Focus: Expand, Listen, Dig Deeper, Think with Others moves (cheat sheet provided with all related academic language functions). Self-Assessment: Students conduct final assessment and final post-design survey.

APPENDIX D

Student Cheat Sheet: Academic Language Functions

SHARE, EXPAND, CLARIFY	LISTEN & REPEAT
In my opinion...	In other words...
From my perspective...	That is to say...
As far as I'm concerned...	Put differently...
What I'm trying to say is.../	This is how I understood what _____
My point is this:	said...
	What I hear _____ saying is...
	He/she's saying...
GIVE EVIDENCE	AGREE & ADD ON
For example...	I agree with that/ _____'s point because...
For instance...	Building on that/ _____'s idea...
According to the author...	In addition.../Adding to what X said...
In the text, on page _____ ...	Moreover...
I'd like to share two pieces of evidence from the text:	Furthermore...
	I have a connection to...
DISAGREE & COUNTER	THINK & LINK
	(Text-Self; Text-Text; Text-World)
I disagree because...	I'd like to draw a connection to...
On the contrary...	This point reminds me of...
On the other hand...	In relation to our theme...
Conversely...	
However...	
Where is your evidence to support that point?	

APPENDIX E

Reader's Theater Sample Text

Reader's Theater Sample Text

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Word Generation Unit 5.03, Why Should I Care?

At Tubman Elementary School, students are having a class party to celebrate the money that was raised for the Japanese Tsunami Fund.

Maari: Francisco, did you really eat all the cake? Please tell me you didn't. We all worked so hard to collect money for the fund. The bakery down the street made this cake for all of us as a thank you gift for all our hard work!

Francisco: Wait a minute, I earned every crumb of that cake. I went out collecting money every afternoon for the tsunami fund. That's why I got the prize for raising the most money for our collection.

Hilde: But, you didn't mention that you raised more money because you broke one of the rules. We weren't supposed to collect from anyone at the subway station.

Maari: Does it really matter? The most important thing is that Francisco raised what the teacher called a **significant** amount of money to help the cause. I only wish the whole school could have done more. It's our **moral** responsibility to help other people who are suffering. The people in Japan need our help.

Hilde: I don't mind helping others, Maari, but what about the people in our town that need help too? It's not our **obligation** to help everybody. I have another idea! Maybe we should just keep this money for our own school and buy new computers for our class. We need new computers, and Japan can just take care of itself.

Francisco: But we need to help Japan because the sooner the country recovers from the earthquake and tsunami, the sooner they'll start producing more Playstations.

Hilde: What? Are you saying that your only **motive** to raise money was Playstations?

Francisco: Pretty much. If the earthquake had happened in Australia, I wouldn't have invested so much time raising money. I'm not really sure what they make in Australia.

Maari: This is unbelievable. I can't believe what you're saying! What if a disaster hit our community, and no one cared? What if no one helped us?

Hilde: Then we would just help ourselves. Instead of worrying about other communities' problems, we should make our own community stronger. If we build our houses, roads, and bridges stronger now, then they won't fall apart in earthquakes or hurricanes or tsunamis.

Maari: I'm sure the Japanese built strong cities and towns, but the tsunami was just too powerful. Why can't we focus on the fact that we aren't isolated from each other—that we share the same planet and that we're interconnected? Ocean **currents** are carrying debris our way. It's going to **affect** our shorelines and our ecosystems. Beaches will close down and summer's coming. Don't you at least care about our beaches?

Hilde: Well, when our beaches are **affected**, I'll be out there cleaning up. But in the meantime, I think that we should just wait until trash and debris actually come to us before we start worrying about it.

Maari: But you care about a lot of other things, Hilde. What about the pandas you're so crazy about? They're endangered, and I know you belong to a group that raises money to save them.

Hilde: Yeah, but they're cute! Trash and debris from the tsunami are harder to love.

Francisco: I think I'm beginning to see Maari's point. I guess it's a win-win situation – helping people and getting something in return.

Maari: Well, it's good that we can disagree and still be friends.

Hilde: You're right. Let's go play! But first we need to clean up our own debris so we can go to recess!

Discussion questions: What impact did the earthquake and tsunami have on Japan? What impact do the characters think this event will have on the United States? Do you feel it is your **moral obligation** to help people in need even though they live far away? Why or why not?

APPENDIX F

Flow Chart: Coding Talk Moves

<p>1) Does the move <i>explicitly</i> encourage students to engage with their peers' ideas for building on and evaluating the collective knowledge of the classroom community? Does the teacher invite students to agree with, disagree with, build on, explain, and/or revise a peer's previously stated idea?</p> <p>Goal: To help students think with others APT Moves: Agree/Disagree; Add on; Explain what someone else means Examples:</p> <ul style="list-style-type: none"> ▪ “Anyone want to add to (build on, agree, or disagree with) what Joe just said?” ▪ “Can anyone explain what Daniel means when he says ____?” ▪ “Who can clarify what Alex means with a personal connection?” ▪ “What evidence do we have to support John's point? Anyone?” <p>(*Note: Although this move may seem like G3, in this case the teacher directs the question to the class so it is G4.)</p>	<p>YES →</p>	<p>Then stop: It is Goal 4 of APT Talk Moves (Chapin, O'Connor, & Anderson, 2009).</p>
<p>NO</p>		
<p>2) Does the move prompt an individual to provide reasoning or evidence to support <i>their own claim</i>?</p> <p>Goal: To help a student deepen his/her reasoning with further probing after an initial claim or a point has been made by that student. APT Moves: Ask for evidence or reasoning Examples:</p> <ul style="list-style-type: none"> ▪ “But does it always works that way?” ▪ “What evidence do you have to support that point?” ▪ “What line in the poem makes you think that the speaker believes that everyone, regardless of his or her cultural background, is an American?” ▪ “Why do you say that?” ▪ “How'd you come to that conclusion?” ▪ “Well, why can't we all just use phones in the classroom? What's the big deal?” ▪ “Yes, but how exactly does your point speak to the idea of citizenship as a responsibility?” 	<p>YES →</p>	<p>Then stop: It is Goal 3 of APT Talk Moves (Chapin, O'Connor, & Anderson, 2009).</p>
<p>NO</p>		
<p>3) Does the move prompt students to rephrase or repeat their peers' ideas without revising, altering, or building on the content of those ideas? (*Note: Code the teacher's move, not the students' responses. For instance, if a student continues to build on the idea after being asked to paraphrase another student's comment, the talk move should still be coded as a G2 not G4.)</p>	<p>YES →</p>	<p>Then stop: it is Goal 2 of APT Talk Moves (Chapin,</p>

<p>Goal: To help students to listen carefully to one another APT Moves: Who can rephrase or repeat? Examples:</p> <ul style="list-style-type: none"> ▪ “Okay. Can someone paraphrase what Daniel just said?” ▪ “Who can tell us, in your own words, what you heard Anna say?” ▪ “Can someone who understands what Trisha is saying say it again with different words to help us understand?” 		<p>O’Connor, & Anderson, 2009).</p>
NO		
<p>4) Does the move prompt students to share, elaborate on, and clarify their own thinking? Does the teacher invite the student to <i>say more</i> about what he or she means? Goal: To help students to share, expand, or clarify their thinking. APT Moves: Time to think; Say more Examples:</p> <ul style="list-style-type: none"> ▪ “Okay, can you say a little more about that?” ▪ “I’m not sure I understand, can you elaborate?” ▪ “Can you say more, maybe given an example?” 	YES →	<p>Then stop: It is Goal 1 of APT Talk Moves (Chapin, O’Connor, & Anderson, 2009).</p>
NO		
<p>5) Does the teacher “revoice” a student’s comment in one of the following ways? a. The teacher repeats what the student said with a questioning or doubting tone to elicit further clarification from the student. b. The teacher paraphrases what the student said to elicit the student’s affirmation and/or to be corrected (by the student) if the teacher misinterpreted the student’s point. c. The teacher acknowledges the student’s idea by repeating it word for word (without a questioning or doubting tone), but the teacher strategically uses wait-time during which the student may affirm or clarify his/her idea. Goal: Help students to share, expand, or clarify their thinking. APT Moves: So, are you saying...? Examples:</p> <ul style="list-style-type: none"> ▪ a. “Oh, so you’re saying that having cell phone usage rules in the classroom is a bad idea because it would break down trust between teachers and students? Is that right?” [There is a rising intonation at the end.] ▪ b. “So, if I understood you correctly, I’m hearing you say that students shouldn’t <i>ever</i> be allowed to use cell phones in the classroom because it would be a disruption <i>all</i> the time.” [The teacher paraphrases the students comment while expressing uncertainty (on the teacher’s end) as to whether or not that was the student’s intended message or point. The student follow up with, ‘well no, I mean it would be most of the time, not all of the time, because...’] ▪ c. “So the speaker in the poem is saying that he is just as American as anyone else.” [There is no rising intonation, but the teacher provides wait time for the student to affirm and/or clarify/refine his/her statement.] 	YES →	<p>Then stop: It is Goal 1 of APT Talk Moves (Chapin, O’Connor, & Anderson, 2009).</p>
NO		

<p>6) Does the instructional talk encourage students to draw connections to or revisit the overarching curricular theme as a way to deepen and broaden students’ understanding of the topic? (<i>Note:</i> In this particular instructional context, the teachers designated “Citizenship: Rights, Rules, and Responsibilities” as the overarching curricular theme. Although the textual content for each discussion differed, teachers encouraged students to revisit the same overarching theme in every Friday discussion – in order to meet one of the district goals.)</p>	<p>YES →</p>	<p>Then stop: It is Link to Overarching Theme Move (LTOT).</p>
<p>NO</p>		
<p>7) Does the instructional talk fall into one of the following categories?</p> <p>Cat. 1 – The teacher introduces a prompt/question for the class to discuss. When instructional talk serves primarily as a discussion prompt (rather than a strategic APT talk move), the instructional talk is not coded as “talk move” although the question may propel student reasoning. Example: “So welcome to our discussion, based on this text, what are you learning about minority and majority groups?”</p> <p>Cat. 2 – The teacher either raises a new line of inquiry for the class to consider or shifts the conversation to a specific idea during the discussion, while only making a vague reference to students’ previously stated ideas. Example: “Okay, so you’ve had a chance to make connection between the text and your lives, now um, who watched the Patriots play last Sunday?”</p> <p>Cat. 3 – The teacher asks for “another idea” or “another person who’d like to share” without specifically having students build upon or add to a previously stated idea – such as in the context of serial questioning or students reciting what’s in their notes. Example: “Ok, what evidence did you have?” “And you... And you...?”</p> <p>Cat. 4 – The teacher has a specific answer in mind that he/she is hunting for. Example: “So, what is the adjective that best describes this speaker? We learned the word in class yesterday, who remembers what it was?”</p> <p>Cat. 5 – The teacher gives procedural directions related to the task at hand. Cat. 6 – The teacher delivers content information. Cat. 7 – The teacher talks about his or her own perspective on a particular topic.</p>	<p>YES →</p>	<p>Then stop: The instructional talk will <i>not</i> be coded as one of the four APT Talk Moves.</p>

APPENDIX G

Decision Rules: Coding Talk Moves

	Conflict Between APT Goals	Decision Rule	Code
A	G1 vs. No Code (I)	If a teacher simply restates a student’s comment without providing any wait-time, than it does not count as revoicing. Use the following questions to guide your decision-making: 1) Does the teacher repeat or paraphrase a student’s comment? If so, it could be G1 or No Code. 2) Does the teacher follow-up with wait-time? If not, it is a No Code. If so, it is G1.	No Code T: “So you’re saying solar –powered planes would help the environment. (no wait-time) Okay, who has something else they’d like to say?”
B	G1 Vs. No Code (II)	If a teacher simply <i>sums up</i> multiple ideas put forth by several students over the course of a discussion, this does not count as a revoicing.	No Code T: “Just to sum up before we go. A lot of you brought up the fact that language is a barrier...but also a lot of you talked about how sometimes people group together to feel more comfortable, etc.”
C	G1 Vs. No Code (III)	If a teacher simply encourages a student to ‘say more’ before the student has even uttered a complete thought, it does not count as the “Tell Me More” (G1) prompt. It is simply encouragement to go on. If the teacher uses the “Tell me More” prompt to get students to elaborate or clarify on an idea that has been uttered, then it is coded as G1.	No Code S: I think, um, (long pause) T: Go on, tell me more. G1 S: I think the whole thing is weird. T: Tell me more.
D	G3 vs. No Code	It may not always be easy to decipher whether a teacher is simply introducing a new idea (or discussion prompt) for the class to consider (“No Code”) or whether the teacher is pressing a student’s reasoning based on a previously made comment (G3). Here are some questions to guide your decision: 1) Does the teacher’s turn contain the words “how” or “why” or “what evidence”? If so, it could be G3 or “No Code.” 2) Does the instructional talk press student reasoning? If so, it still could be G3 or “No Code.” 3) Does the instructional move press a student to provide reasoning/evidence <i>for their claim</i> ? If so, it is G3. 4) Does the teacher introduce a new idea (as in a new discussion prompt)? If yes, it is a “No Code.”	No Code: T: “So welcome to our discussion, based on this text, <i>why</i> do minority groups sometimes feel isolated?” G3: T: “Good point Mia, but would that always be the case, Mia?”

E	G4 vs. No Code (I)	When a teacher uses words such as “other ideas” “another comment”, it can be difficult to decide whether or not to code a teacher’s turn as G4 (help sts. think with others) or as a “No Code.” Here are some questions that can help guide your decision: 1) Does the teacher ask the class for “other idea or thoughts”? If so, it could be No Code or G4. 2) Does the teacher ask for other ideas/thoughts/evidence without directly having students build upon or add to a previously stated idea in the context of serial questioning? If so, it is “No Code.” 3) Does the teacher ask students to build on a previously made comment (perhaps by referring to a student’s name or comment)? If so, it is G4.	No Code (serial questioning): T: “Ok, what’s your piece of evidence? What did you come up with? How about you? What’s your answer? And what did you have?” G4: T: “Who can add to Carlos’s idea?”
F	G4 vs. No Code (II)	In cases where the teacher asks students to “help out” another student, it may be difficult to distinguish whether to code the teacher’s turn as “No Code” or as G4. If the teacher asks the student a question, but the student does not know or cannot answer the question for any reason, then it is a “No Code.” However, if the student makes a claim or provides some reasoning - but struggles to further develop his or her idea, then it is a G4.	No Code T: “What do you think the author means in that line?” S: {silence} “I don’t know.” T. “Who can help out Carlos?” G4 T: “What do you think the author means in that line?” S: “I think he means that every person is American. T. Why do you think that? S. Because it doesn’t matter, your culture, um, {long pause} um, {long pause” T. “Hmm…who can help out Carlos?”
G	No Code vs. LTOT	It may be difficult to distinguish between questions that serve as discussion prompts (“No Code”) and questions that encourage students to revisit and draw connections to the overarching curricular theme (LTOT). See examples to the right to help guide your decision.	No Code: T: “What are your impressions of the solar-powered plane?” (This question does not explicitly ask students to draw a connection to the curricular theme. LTOT: T: “Well, now let’s move on and think about our theme of citizenship. How does the solar-powered plane relate to citizenship and responsibility?” (Each week, discussions revisit the same theme and the teachers encourage students to draw connections between the new textual material/content and the overarching course theme.)

H	G1 vs. G3	The teacher's turn contains more than one talk move: to help students share, clarify and expand their thinking (G1) and to deepen reasoning (G3). In this case, G3 subsumes G1 – so it is G3.	<p>G3 T: "Tell me more about that idea, um why do you think that it would be better to ban cell phone in the classroom?"</p> <p>S: "For example, it would be better because no one can cheat but on tests, um but if like the teacher wants students to look up things in the dictionary, um then it would be bad.</p>
I	G2 vs. G4	The teacher's turn contains more than one move: to help students to listen carefully to one another (G2) and to help students think and reason with others' ideas (G4). In this case, G4 subsumes G2, so it is G4.	<p>G4 T: "Does anyone want to tell us what you heard Lila say, and then try to help us understand the idea better?"</p>
J	G3 vs. G4	The teacher's turn contains one talk move that can be coded in more than one way. If a teacher follows up on a student's comment with "Would that always be the case?" but directs the question to the whole group, then it would be G4. The teacher is indirectly asking if others agree/disagree, so the class would be building on a previously made comment. In this case, G4 subsumes G3.	<p>G3 <i>Lila</i>: "Cell phones will disrupt learning." T: "Would that always be the case, Lila?"</p> <p>G4 <i>Lila</i>: "Cell phones will disrupt learning." T: "Would that always be the case? What do you think, Tomas or anyone else?"</p>
K	Chunk	When the teacher repeats the same move several times before students respond (or before students respond in a way that is "satisfactory" to the teacher as in repetitive questioning until the teacher gets the answer he or she is looking for), then the repetitions are counted as one chunk – one talk move. (* Only Count the first TM if it is part of a chunk.)	<p>Chunk, Counted as one Talk Move T: "Tell me more." (Teacher uses wait time. The student does not respond, so the teacher repeats.) T: "I mean, I really think you're onto something, but tell me more about what you mean."</p>

APPENDIX H

Preliminary List of Needs Assessment in Collaboration With Teachers

<p>Participation:</p> <ul style="list-style-type: none"> • Silence or abbreviated responses. • The voices of English proficient students outweigh the voices of English learners. • Teacher talk outweighs student talk.
<p>Individual Reasoning</p> <ul style="list-style-type: none"> • Students need support in articulating their views and extending their thinking. • Students need support with how to justify their thinking with reasoning and evidence (e.g., from the text).
<p>Collaborative Reasoning in Whole Group Discussions (not enough interaction)</p> <ul style="list-style-type: none"> • Students need support with developing <i>active listening skills</i> in discussion settings (e.g., Students talk but do not listen or respond directly to peers' comments; use of eye contact with peers who are speaking). • Students need support in understanding how to reason together and build on one another's comments.
<p>Making Connections</p> <ul style="list-style-type: none"> • Students need support with strategic linking (text-self; text-text; text-theme; text-world), as a way to deepen their reasoning
<p>Passivity</p> <ul style="list-style-type: none"> ▪ Students do not take responsibility for the quality of the discussion. ▪ Teachers do most of the thinking and talking.
<p>Academic Language Functions for Communicating in Discussion Settings</p> <ul style="list-style-type: none"> ▪ Students need support with how to frame comments in response to previously made comments. ▪ Students need academic language scaffolds (words and sentence stems) to facilitate communication and reasoning in discussion settings (e.g., "I agree with"; "from my perspective"; "in addition to what X said").
<p>Content-Specific Academic Language</p> <ul style="list-style-type: none"> ▪ Students need support with unfamiliar content-specific vocabulary or grammatical structures in text that inhibit comprehension of text. ▪ Students need morphological skills (derivational morphology) to use complex words in discussions (e.g., diverse [adjective], diversity [noun], diversify [verb]).
<p>Contextualization & Schema</p> <ul style="list-style-type: none"> ▪ Students want to participate in talk but need more support in developing background knowledge (social, cultural, or historical context/background knowledge) about the text in focus.
<p>Students' Attitudes and Beliefs about Discussion-Based Learning</p> <ul style="list-style-type: none"> ▪ What does a "good" discussion look like? What is the purpose of a discussion? ▪ What kinds of contributions can I make in a discussion (e.g., express an opinion, evaluate a comment made by a peer; draw a link to self or previously discussed text). ▪ What kinds of language (verbal and nonverbal) can help me participate in a discussion?
<p>Cultural/Academic Participation Norms</p> <ul style="list-style-type: none"> ▪ Students need support with navigating different cultural norms for participating in academic discussions (e.g., students uncomfortable with challenging or disagreeing with their teachers or peers)

APPENDIX I

Student Self-Assessment

Directions: Evaluate your participation in class discussions. Mark or use a check mark to answer *always*, *sometimes*, or *rarely/never*.

Statement	Always	Sometimes	Rarely/Never
A) I share my ideas/opinions in class discussions.			
B) I say more about what I mean if others seem confused.			
C) I use evidence from the text to make my points.			
D) When I agree with a classmate, I add on to what was said.			
E) When I disagree with a classmate, I say so and I explain why .			
F) I listen carefully and use my own words to repeat/explain what others say.			
G) I ask questions during class discussions.			
H) I make connections to my personal life .			
I) I make connections to other texts we have read/discussed.			
J) I make connections to world events (in the news, etc.).			
K) I make connections to the theme : <i>Citizenship</i> .			
L) I use academic language to express my thinking. (<i>For example; This is evident in the text; Contrary to what Mary said, etc....</i>)			
M) I speak up so everyone can hear me.			
N) I make eye contact with my teachers and classmates during discussions.			

APPENDIX J

Pre- and Post-Study Survey

Directions: Answer each question. Give reasons for each answer to questions 1-6.

- (1) Do you prefer classes with discussion or without discussion?
- (2) How do you feel about talking in a discussion?
- (3) What does it mean to be 'part of a discussion'? What do you do?
- (4) Do discussions help you learn? If yes, then how?
- (5) A discussion is boring when...
- (6) A discussion is interesting when...
- (7) It is okay to disagree with my classmate in a discussion.
 - True False
- (8) It is okay to disagree with my teacher in a discussion.
 - True False
- (9) It is okay to ask questions in a discussion.
 - True False
- (10) A teacher should speak the most in a class discussion.
 - True False
- (11) There should *never* be silence during a discussion.
 - True False
- (12) Talking is more important than listening in a discussion.
 - True False
- (13) It is never okay to use disrespectful language, even if you disagree with someone's idea.
 - True False

(14) It is not my problem if people can't hear me when I speak.

- True False

(15) If I have a lot to say, it is okay to speak for a long time.

- True False

Draw a picture of a discussion below:

1) In discussions, I am good at:

2) In discussions, I need to improve on:

APPENDIX K

Content and Language Objectives Prepared by Teachers for Each Discussion

12/16	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen, and to engage with their peer’s thinking in conversation.</p> <p>Content Objectives: Students collaboratively discuss each character’s perspective in the text and consider whether students share responsibility for each other’s behavior in school. Students discuss how today’s topic relates to the overarching course theme of Citizenship.</p>
1/13	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objectives: Students collaboratively discuss what, according to Martin Luther King, Jr., is meant by the “quest for peace and justice.” Students discuss how today’s topic relates to the overarching course theme of Citizenship.</p>
1/20	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objectives: Student collaboratively define/discuss tolerance, and consider how the topics discussed in the interview with John Hope Franklin relate to the overarching course theme of Citizenship.</p>
1/27	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objective: Students collaboratively discuss their responses to the experiences of the refugee students at Mapleville Elementary. Students discuss the concepts of inclusion and exclusion, drawing connections to the overarching course theme of Citizenship.</p>
3/10	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objective: Collaboratively discuss the significance of the title of the poem “I, Too Sing America” by Langston Hughes, drawing connections to the overarching course theme of Citizenship.</p>
3/24	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objectives: Collaboratively discuss how the students at the Tubman Elementary School respond to the Japanese earthquake and tsunami, considering whether it is your moral obligation to help people in need even though they live far away. Discuss how today’s topic relates to the overarching course theme of Citizenship.</p>
5/5	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Students use academic language functions to articulate their views and reasoning, to listen to one another, and to engage with their peer’s thinking in conversation.</p> <p>Content Objectives: Collaboratively discuss the pros and cons of single-sex schools, drawing connections to the overarching theme of Citizenship.</p>
5/19	<p>Language Objectives: CCSS.ELA-LITERACY.SL.5.1 A, B, C, and D. Content Objectives: Collaboratively discuss whether or not we need laws to regulate behavior. Discuss whether it justified to ban cell phones from schools because some kids misuse them, drawing connections to the overarching course theme of Citizenship.</p>

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CURRICULUM VITAE

