The Effect of a Cognitive Model, Thinking Maps, on the Academic Language Development of English Language Learners

by

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Dedication

This dissertation is dedicated to my sons, Daniel Luis and Robert Luis, the lights of my life, who were at the ready to assist me whenever I needed their help, especially when the computer failed. Their technical talents and emotional support were most reassuring. They encouraged me and relieved me from many domestic duties so that I could dedicate my time and energy to this dissertation. Their hugs, smiles, compassion, and forgiving nature are a blessing. I am privileged to be their mother. Also, I dedicate this work in loving memory to my mother and father, Rosario and Francisco. They believed that one day I could attain my doctorate. My gratitude for their support and encouragement is infinite.

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Biographical Sketch

Estrella Lopez is currently a full time faculty member in the Graduate division of the College of New Rochelle. She received her BA from Dowling College in 1975 and her MA degree from Long Island University at C.W. Post College in 1981. In 1983 she earned a School Administrator's degree at C.W. Post. She is also a national educational consultant to school systems seeking change in order to improve the achievement of all students. After 35 years of service, including an appointment as District Director for Instructional Services and Programs for English language learners (ELLs), Ms. Lopez retired from the public school system in 2009. She joined the Ed.D. Program in Executive Leadership of the St. John Fisher College off-site program at the College of New Rochelle during the summer of 2009 to research the application of a cognitive model that teachers use to influence the achievement of ELLs. Ms. Lopez conducted her research under the direction of Dr. Walter Sullivan. She currently serves on the boards of several national institutions.

Abstract

This study describes how teachers of two urban suburban schools with large numbers of English language learners (ELLs) used Thinking Maps as a cognitive model resulting in student's improved academic language development. Teachers used Thinking Maps that included a common cognitive language that transcended grade levels and disciplines.

An antecedent condition for these results was school-wide professional development of teachers' expertise using Thinking Maps. Teachers' anecdotal reports and samples of student work gave evidence to this researcher's hypothesis: participating schools that implemented cognitive visual tools improved the academic language development of all their students.

A phenomenological methodology was used to guide a descriptive qualitative study. Interviews and a survey served as the instruments for collecting data to gain insight into the factors that support teachers' capacities to influence ELLs' development of academic language.

Findings of the study revealed a conceptual framework: a *Model for Full Access for High Achievement* in which five essential components describe the successful use of Thinking Map to teach ELLs.

The research provides recommendations for administrators and teachers regarding the application of the *Model for Full Access for High Achievement.* A whole-school approach for teachers utilizing a common, cognitive tool proved significant in supporting

ELLs, one of the most vulnerable sub-groups of students pressured to perform by the challenges of Common Core Standards.

The study concludes that additional research (e.g., longitudinal studies, mixed populations etc.) needs to be conducted on the efficacy of Thinking Maps to improve academic achievement among ELLs, as well as students with special needs and struggling learners.

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Chapter 1: Introduction

The 2010 Census Bureau has reported that Hispanics are now the majority of the population in 28 cities in the United States (Fry, 2009). More than one in 10 of students in American schools are English language learners, of which the majority is Hispanic (Terrazas & Fix, 2009). This demographical shift is worthy of serious concern for all educators. The education of English language learners (ELLs) in the United States has been studied extensively in educational research. While there are numerous studies on the acquisition of English as a second language, the research on the acquisition of academic language among ELLs is very limited (Gersten, R., Baker, S. K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R., 2007). Instruction in content areas such as math, science, and social studies present formidable obstacles for ELLs: They are challenged to comprehend the formal language of the classroom in order to make meaning of what they learn. The language of the classroom requires more cognitively demanding language skills than the language of everyday experiences (Cummins, 2000).

In an era of rigorous learning standards and accountability under government mandates such as federal legislation, the No Child Left Behind Act of 2001 (NCLB), and the Common Core Standards (CCS) (CCSO, 2009) adoption based on competitive grants, teachers are uncertain how to approach language acquisition and cognitive development, simultaneously. Researchers have offered numerous and valuable structures for programs designed to improve instruction for ELLs (Echevarria & Vogt, 2008; Reiss, 2008; Herrell & Jordan, 2003). It appears, however, that despite all of these research-

based resources, teachers require practices they can use, own, and transfer regardless of language and settings. Teachers can no longer be given a multitude of inconsistent strategies, disconnected ideas, and expect high academic results among ELLs. Specific teaching and learning practices that work for ELLs merit close examination.

Problem Statement

Christina Igoa (1995) in her book, *The Inner World of the Immigrant Child*, quotes an eleven-year-old boy from Afghanistan living in America:

> Good morning teacher thanks for helping us. You are a very kind teacher and peaceful. I did my spelling, math and history, but I got a little problem about it. If you please help me that the words I don't know. Please call me and solve my problems… (p. 9)

Any educator observing classrooms in America today can fully appreciate the dilemma faced by students whose first language is not English. The school-age student population of the United States continues to grow more racially/ethnically and linguistically diverse. ELLs are now in every classroom in every school in the nation.

What statistics reveal. Over the past thirty years, researchers have demonstrated that ELLs, primarily Hispanics, will constitute the largest demographic population in America; yet they are in peril of not attaining high levels of academic achievement (Jamilah, 2000). ELLs constitute a growing proportion of the American school-age population. The National Clearinghouse for English Language Acquisition has reported that between 1990-1998 and 2005-2006 the population of ELLs more than doubled from 2,030,451 to 5,074,572 students (NCELA, 2007). Results of the National Assessment of Educational Progress (NAEP, 2007) in reading and mathematics indicate that fourth

grade ELLs scored 36 points below non-ELLs in reading and 25 points below non-ELLs in math. The gap among eighth graders is wider: 42 points in reading and 37 points in math.

Most ELLs were born in the United States. They have attended American schools for their entire lives (Cap, Murray, Passel, & Herwantoro, 2005). Because there appears to be multiple opportunities to learn English, the low levels of academic achievement among ELLs are disconcerting. ELLs, especially Hispanics, are not achieving academically in comparisons with the White sub-groups (NAEP, 2008). In light of the NAEP results, researchers must examine why ELLs do not attain English academic language proficiency.

According to Xiong and Zhou (2006), the pass rates of ELLs on mathematics high school exit exams are 30-40% lower than those of mainstream students. In 2005, 36.5% of Hispanic 16- to 24-year-olds were foreign born; most of those who spoke English as a second language were high school dropouts. Hispanic youth are almost four times more likely than White students, and twice as likely as African American students to drop out of high school (Snyder, Dillow, & Hoffman, 2008).

The National Center for Education Statistics (2002) indicated that 42% of teachers surveyed had ELLs in their classroom, but only 12.5% of these teachers had received more than eight hours of professional development specifically related to ELLs. It is critical that teachers work effectively with both ELLs and fluent English speakers (Echevarria, Vogt, & Short, 2004). These statistics must not continue to go unnoticed.

To reveal the intelligence of these students through meaningful academic learning opportunities is a moral duty. ELLs are represented in all classrooms across the United

States. Though efforts are made to bring ELLs to fluency in English; still, as a group, they lag well behind in terms of academic achievement (Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). When will the country realize the urgent need to secure a citizenry that has not only acquired basic literate and proficiency in speaking English, but also can think critically? Recognizing this distinction is essential for the academic achievement of ELLs. Researchers and teachers must pay special attention to facilitating cognitive or thinking processes with regard to academic language learning. This study explicitly reveals the intersection between the theories of cognitive processes, visual tools, and academic language acquisition among ELLs.

Finding what works to teach ELLs has been the quest of many researchers. Numerous books, professional development opportunities, workshops, and conferences have focused on the growing concern that ELLs face significant challenges in meeting English and math standards. Teachers are encouraged to use as many strategies as possible to meet the needs of these students. Researchers offer an array of ideas and strategies to improve the teaching of ELLs (Echevarria & Vogt, 2008; Reiss, 2008; Herrell & Jordan, 2003). These researchers and many other instructional materials offer meaningful resources to teachers; yet, the sheer number of these ideas and strategies leave teachers still searching for what works to teach ELLs. How can researchers support teachers of ELLs?

Anna U. Chamot, a cognitive specialist on how ELLs learn, highlights the attention educators need to pay when considering strategies for instruction. Chamot (2004) clearly states:

> Learning strategies are the conscious thoughts and actions that learners take in order to achieve a learning goal. Strategic learners have meta-cognitive knowledge about their own thinking and learning approaches, a good understanding of what a task entails, and the ability to orchestrate the strategies that best meet both the demands of the task and their owns strengths… (p. 14)

In order to influence the education of ELLs, teachers must thoughtfully consider the strategies they use. Educators must focus not only on increasing ELLs' ability with the English language but also on clearly and carefully selecting strategies that will enhance the students' cognitive development and academic language development, simultaneously. The "cornucopia" approach of utilizing numerous ideas, activities and strategies for teaching ELLs, while useful to many teachers, appears to have a limited effect on the achievement levels among ELLs nationwide.

This researcher recognizes that there are additional factors that affect academic achievement among ELLs such as social and economic concerns, educational experiences, and cultural differences. The study, however, focused on teaching practices, in particular the application of cognitive tools for the development of academic language among ELLs. Crawford (1997) states that ELLs are "50% more likely to live in poverty" (p. 6). Crawford also cites a study of Title I of ESEA programs which found that "54% of LEP children in grades 2 and 3 came from families living in poverty — twice the rate for all public school students" (p. 6). Ballantyne, Sanderman, and Levy (2008) noted that "almost 6 in 10 adolescent ELLs qualify for free or reduced price lunch" (p. 7) and that many ELLs "are faced with the hardships of poverty and language barriers" (p. 16). Might teachers lack the tools to cultivate these students' intellectual capabilities for

learning in spite of poverty and low proficiency in English? The intention of this study is to discover what teachers do with cognitive models and whether or not using these models improves the academic language proficiency of ELLs so that they can reach higher levels of academic achievement.

Race to the Top and Common Core Curriculum. During the past ten years numerous reports and studies regarding the poor academic achievement of ELLs have called the nation's attention to this crisis (Goldenberg, 2008). While researchers and curriculum experts have provided significant suggestions, approaches and strategies for classroom teachers, ELLs remain at risk.

In 2009 new federal education initiatives known as Race to the Top (RTTT) required schools receiving RTTT funds to implement the new Common Core Standards (CCS) (CCSO, 2009) in English language arts and math. The CCS were designed to develop students with the skills to meet the new academic and workforce demands of the 21st Century. The focus of the CCS is to support students in developing higher-order thinking, problem solving and developing complex ideas. These skills require students to engage in meaningful learning steeped in academic language.

The CCS for English language arts (ELA) articulate rigorous grade-level expectations in the areas of speaking, listening, reading, and writing English to prepare all students to be college and career ready, including ELLs. Clearly, the CCS includes new learning standards that focus on academic language. Teachers are challenged to mediate cognitively demanding tasks so that all students, especially ELLs, can achieve success. If there was little change in achievement levels among ELLs under the NCLB mandates, will new standards improve ELLs' achievement? This study examined a visual

tool that appears to improve academic language among all students, but most interestingly, among ELLs, when used systematically to mediate cognitively demanding tasks across the curriculum.

Academic language. Often educators ask, "What differentiates students who 'make it' in schools today from those who don't?" There are many factors at play, but very prominent among them is mastery of academic language (Scarcella, 2003). Scarcella's research highlights that students with a strong ability to use academic language are likely to perform well in academic and professional settings; while those students who lack the ability to use academic language are at higher risk of dropping out of school.

The acquisition of academic language demands deliberate instruction that is contained in meaningful learning tasks. Without it, students cannot access the core curriculum. Scarcella (2003) encourages daily intensive instruction that includes vocabulary, content, writing, and reading comprehension, as well as direct scaffolding of oral language. Catherine Snow (2010) points out that students struggle with academic language because it is designed to be precise and concise with an authoritative tone. Further, academic language has complex grammatical structures that may interfere with comprehension. ELLs in particular need strategies and tools to comprehend academic language.

Visual tools for learning: A comprehensible language for ELLs. In an effort to address the development of academic language among ELLs, an urban-suburban school district in New York introduced Thinking Maps into classroom instruction. Thinking Maps® developed by Dr. David Hyerle (1996) is a common visual language for learning.

Educators in the Urban-Suburban School District examined for this study use Thinking Maps in all content areas and all grade levels. This visual language includes eight patterns, each linked to a specific cognitive process (see Appendix C). The eight Thinking Maps (Hyerle, 1996) are as follows: (a) Circle Map used for defining in context, (b) Bubble Map used for describing with adjectives, (c) Flow Map used for sequencing and ordering, (d) Brace Map used for identifying part/whole relationships, (e) Tree Map used for classifying/grouping, (f) Double Bubble Map used for comparing and contrasting, (g) Multi-Flow Map used for analyzing cause and effect, and (h) Bridge Map used for illustrating analogies, plus a separate Frame of Reference used to bring forward prior knowledge or inquiry on a topic or concept.

Such tools and strategies support the development of the neuronal pathways (Wang, Lin, Kuhl, & Hirsch, 2007) which lead to academic language proficiency. Tools that trigger neuronal cognitive interactions during a learning experience are essential for student achievement in a rigorous curriculum that demands they make sense of academic language. The school district's director for instructional services and programs for ELLs believed that the Thinking Maps would enhance academic language learning among ELLs. She hired a consultant to teach teachers with ELLs how to use Thinking Maps in their instruction.

During the implementation of Thinking Maps across the curriculum, the linguistic and cognitive development of ELLs appeared to increase considerably. Teachers demonstrated Thinking Maps their students had drawn and commented on how well ELLs were able to use these visual tools to engage with complex academic language.

Teachers provided instruction to bilingual students in Spanish or in English. Teachers reported that the consistency of the cognitive processes and terms that define each of the Thinking Maps made it easy for students to recall the different maps in their native language as well as in English. The goal in the implementation of the Thinking Maps was to focus on engaging students in cognitive academic language while performing academic tasks, in tandem with learning English as a second language.

Teachers shared samples of their students' writing that revealed sophisticated academic language. Teachers expressed how ELLs became more articulate and able to negotiate content in a different manner when using Thinking Maps. Teachers also felt that these visual tools accessed students' thinking, revealing high levels of comprehension and use of academic language.

Over four years of implementation, teachers constantly examined their instructional methods, delivery and teaching patterns. They self-examined their language of instruction and the quality of the questions they asked in their teaching and learning experience. The consultant provided many workshops and coaching sessions, but did not apply an empirical method to examine why teachers felt that these visual tools had such a powerful effect on the academic language of ELLs. This researcher, intrigued by how teachers discussed their experiences and outcomes during the implementation of the Thinking Maps, sought to establish a method to examine this phenomenon.

This study examined the variables that explain and contribute to the effective implementation of Thinking Maps designed to increase academic vocabulary and accelerate English language acquisition among ELLs. The study did not examine students' performance on assessments; instead, it focused on the teachers that work with

ELLs on a daily basis. The study examined teachers' perceptions of how Thinking Maps affect the teaching and the learning of ELLs.

Theoretical Rationale: Interconnectedness

This dissertation reflects the theoretical interconnectedness of (a) cognition — that is, the brain's creation of context — with (b) concept maps or visual tools, and (c) second language learning. The underlying theory of Thinking Maps implies that the brain is central to the argument that proves the efficacy of these cognitive visual tools (Hyerle, 2009). The literature on brain-based theory indicates how the static view of intelligence has changed over time; and current research supports explicit learning experiences. In her book, *Brain Matters*, Patricia Wolfe (2005) writes, "Probably one of the most critical aspects of hemispheric specialization (brain research) is the issue of context. Our understanding of what we read or our comprehension of what we hear depends on the context within which it occurs" (p. 46). The researchers of second language learners agree on the significance of context (Chamot & O'Malley, 1994). Relevant context is essential for ELLs.

Cognition. Researchers in the field of cognition have often examined the dynamics of language, thinking, and learning. The Thinking Maps has its foundation in the cognitive sciences, particularly as articulated by David Ausubel. Theoretical principles on cognitive psychology espoused by Ausubel (1963) laid the foundation for concept mapping. Ausubel's research focused on how individuals learn large amounts of meaningful academic content from verbal/textual presentations in teaching and learning settings. His theories are similar to that of Gestalt theorists who emphasize higher-order cognitive processes. Ausubel's work also embeds schema theory. Bartlett (1958)

suggested that memory takes the form of schema which provide mental frameworks for understanding and remembering information. A review of the literature reveals a number of similarities between concept mapping and cognitive theory, such as Brunner's "spiral learning" model. Spiral learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge (Brunner, 1990). Piaget's (1981) "concrete operations", Vygotsky's (1981) social-cultural theory, especially his concept of the zone of proximal development (ZPD), focused on the scaffolding approach to learning: incremental understanding of the concepts taught., focused on the scaffolding approach to learning: incremental understanding of the concepts taught. Both Piaget and Vygotsky have informed the entire body of research on second language learning.

Concept maps or visual tools. Joseph Novak (Cardellini, 2004) created concept maps. As a student he exhibited an affinity for learning and the field of education; he wanted to help people to "learn how to learn." He believed that concept maps were a way to represent knowledge in every area of education. Novak argued that concept maps prompted new ways of learning and helped to clarify misconceptions as students' construct their own knowledge. Novak advocated concept maps as a means for human constructivism. One of the pioneers in cognitive science, David Ausubel, had a strong influence on Novak's and Cañas' (1990) theoretical foundation for the applications of concept maps. Ausubel's (2002) most important contribution to the teaching and learning experience in the classroom was the applications of graphic organizers or concept maps. These visual tools serve as mental learning supports to help students integrate new information with what they already know, leading to meaningful learning. This is significant for the study because the Thinking Maps are examined in relationship to their

function in the educational experience of ELLs. The eight maps are founded on the work of Ausubel, Novak and Cañas. As an expansion of the value of concept maps or graphic organizers, Thinking Maps serve as tools designed to communicate rich patterns of thinking, thus helping ELLs take ownership of their learning experiences.

Second language acquisition. The integration of cognition and second language acquisition forms the theoretical foundation for much research on second language acquisition. In their seminal work, *School Effectiveness for Language Minority Students*, Thomas and Collier (1997) point out that while language development is beneficial, to get the full power of the subject matter students need to be challenged academically across the curriculum. Researchers maintain that ELLs need to do cognitively complex, school-related tasks appropriate for their age, while materials must be meaningful for students at their proficiency level in the second language.

Anna U. Chamot has been a leader in the approach of explicitly supporting the notion that ELLs require cognitively demanding learning experiences. Her work on Cognitive Academic Language Learning Approach (CALLA) is influential in the process of educating ELLs. Chamot and O'Malley (1987) indicate that learning strategies derived from a cognitive model of learning assist comprehension and retention of both language and content. The cognitive factor is essential to this study and its significance. Experts in second language acquisition remain concerned that deliberate attention to learning and cognitive development must have priority in order to improve academic achievement among ELLs (Cummins, 1994). Cummins' (1984) common underlying proficiency model (see Appendix D) illustrates the significance of the interplay of second language processes and social/academic language. The graphic depicts two icebergs

appearing separate above the surface, but the same at their base. In other words, two languages, though visibly different in outward conversation, are interconnected and do not function separately in the minds of ELLs who are managing both their native language and their second language, English.

Cummins (1984) also argues that learning ranges in complexity along one continuum from "cognitively undemanding to cognitively demanding and along [an]other continuum from context-embedded to context-reduced" (p.139). (See Appendix E.) Cummins defines a task in which the student has access to a range of additional visual and oral cues as context-embedded. A context-reduced task, on the other hand, is similar to listening to a lecture with no visual aids or to reading dense text with no subheadings or illustrations (i.e., where there are no sources of meaning other than the language itself). Cummins found that when teachers ask students to perform a cognitively demanding and context-reduced task, the degree of difficulty is significantly increased. ELLs are routinely asked to perform cognitively demanding and context-reduced tasks because they lack the English proficiency to derive meaning from text; yet their academic success depends on their ability to accomplish such tasks. Teachers at the urban-suburban schools to be studied used Thinking Maps to provide context for academic tasks across the curriculum. Their goal was to increase academic achievement among ELLs.

Chamot connects Cummins' context-embedded and cognitively demanding frames with cognition and academic language development. The theoretical foundation of Chamot's CALLA and Cummins' frames has evolved into a very effective instructional framework: The Sheltered Instruction Observation Protocol (SIOP) (Echevarria & Short, 1999). SIOP is an instructional approach that focuses on both

language and content objectives. Over the past decade in order to meet the standards of No Child Left Behind, educators across the country have incorporated the SIOP model for teaching ELLs to address academic language development.

One of the SIOP strategies suggests that teachers use graphic organizers (GOs). While related to GOs, the Thinking Maps are explicitly associated with specific cognitive processes for understanding; and GOs are not. It is important to note this difference. The fundamental premise of Thinking Maps highlights the relationship between cognition, language, and learning. This study attempts to link the research in cognitive science and English language acquisition to Thinking Maps. It examines the literature on cognition, English language acquisition, and the use of GOs, in particular, Thinking Maps in order to observe how these concepts intersect to establish a model that can support academic language development among ELLs.

Significance of the Study

Education reform in America, especially NCLB, presents significant challenges for ELLs. Congress has recently passed legislation that creates new national standards that all students must meet. The Race to the Top (2009) initiative mandates that states compete for funds based on meeting the Common Core Standards. The guidelines of the Race to the Top initiative do not outline how these standards and assessments will meet the academic needs of ELLs, leaving school districts with more questions than answers on how to educate ELLs. A report prepared by the National Clearinghouse for English Language Acquisition (NCELA, Acquisition (Department of Education, 2007) describes the need to focus on what teachers need to know and do regarding ELLs:

> More and more teachers of "mainstream" general education classes, who normally do not have special training in "ELLs" or bilingual education, are faced with the challenge of educating these children. Even the most committed teachers cannot provide high quality education without appropriate skills and knowledge. (p. 1)

The complexity of teaching ELLs may seem daunting. The numerous books on strategies to support the education of ELLs give educators a plethora of approaches that promote more inconsistencies than solid results. Teachers reported to this researcher that the use of Thinking Maps as visual tools for cognitive development and academic language acquisition is critical as educators search for tools that work to teach ELLs. All students are entitled to a high quality education that takes into account their unique talents and needs. Academic English has proven difficult for ELLs, especially in the area of reading and writing (Scarcella, 2002); yet English proficiency is essential for full academic parity with English-speaking peers.

More than 20% of U.S. residents speak a language other than English at home (U.S. Department of the Census, 2001). The majority of ELLs in the U.S. are Hispanic (Batalove & McHugh, 2010); and according to the 2000 U.S. Census, the Hispanic population rose by 58% between 1990 and 2000 (U.S. Department of the Census, 2001). This trend is likely to continue as a result of immigration and high birth rates within the Hispanic community. The U.S. Census Bureau predicts that by the year 2060 the U.S. will be a nation composed exclusively of minorities and there will no longer be a majority racial/ethnic group (U.S. Department of the Census, 2001).

One of the fundamental questions of educational reform in the 21st Century will be how to meet the educational needs of ELLs, so that they are able to compete at high levels of academic achievement. ELLs in the United States face huge challenges when it comes to competing effectively in schools and in the world of work. Specifically, Goldenberg (2008) warns:

> …whatever the explanation for these achievement gaps, they bode ill for English learners' future educational and vocational options. They also bode ill for society as a whole, since the costs of large-scale underachievement are very high. (p. 11)

Purpose of the Study

In a concerted effort to provide quality education for ELLs, an urban-suburban school district in New York introduced the Thinking Maps developed by Dr. David Hyerle (1996) to determine if the use of visual tools would make learning language and content meaningful for ELLs. One of Hyerle's premises is that to be effective all the teachers must use Thinking Maps consistently and with fidelity. This gives ELLs multiple opportunities for application of the Thinking Maps across the curriculum. The school district in the study has adopted the Thinking Maps approach and has prepared teachers to implement this approach in the instruction of ELLs. During the past four years there has been continuous and sustained professional development for teachers in the district to help them integrate the Thinking Maps into their instruction for the entire student population. Training on how to use the maps has moved from elementary to middle schools, and teachers report that they have observed improved skills with which all students, especially ELLs, are entering subsequent grades. Anecdotal evidence

supports the hypothesis that ELLs' linguistic and cognitive development increased considerably because of the consistent use of the Thinking Maps across the curriculum.

The purpose of this study is to determine what, if any, are the effects of the use of Thinking Maps to expand ELLs' English academic vocabulary and language comprehension. A careful examination of what teachers do with the Thinking Maps that engages ELLs in meaningful acquisition of academic language will be a contribution to the field of educating ELLs.

Current qualitative and quantitative research posted on the Thinking Foundation website includes dissertation studies on the Thinking Maps. Each of the studies points to specific positive findings in the area of reading and language arts. The number of studies and research papers is limited; therefore, there is a need to expand the research on this visual tool as it relates to ELLs.

Research Questions

The study hypothesizes that Thinking Maps, a cognitive visual tool for learning, can positively affect academic language acquisition among ELLs. To test this hypothesis the research seeks to answer the following essential question: Under what conditions do the Thinking Maps positively influence the development of academic language among ELLs? The research questions to guide the study are as follows:

1. How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?

2. Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?

3. Given the different goals and objectives with which teachers engage ELLs in academic vocabulary development and comprehension, are there specific strategies and methods of using Thinking Maps that support these particular goals and objectives, which lead to academic language learning?

Definition of Terms

For the purpose of this study, the following is a definition of terms listed for clarification purposes:

Academic achievement refers to communications, mathematics, science, social science, thinking skills, and competencies that enable a student to succeed in school and society.

Academic language refers to the language of textbooks and content matter tasks.

Assessment refers to what a student knows and can do.

BICS refers to Basic Interpersonal Communication Skills (Cummins, 1979).

Bilingual means learning and knowing two languages.

CALLA refers to the Cognitive Academic Language Learning Approach designed to support academic rigor among ELLs (Chamot & O'Malley, 1986).

CALP refers to Cognitive Academic Language Proficiency (Cummins, 1979).

Cognition is a term that refers to the mental processes involved in gaining knowledge and comprehension, including thinking, knowing, remembering, judging, and problem solving. These are higher-order functions of the brain and encompass language, imagination, perception, and planning.

Cognitive refers to the skills for reasoning and thinking.

Cognitively demanding refers to the complexity of academic tasks.

Cognitively undemanding refers to easier tasks to manage and learn.

Common Core Standards (CCS) refers to the 2009 mandate under Race to the Top.

Concept maps are special web-forms for exploring knowledge and understanding information.

Constructivism refers to the theory that humans generate knowledge and meaning from their experiences.

Context-embedded refers to many cues and clues that help create meaning in text.

Context-reduced refers to limited cues and clues that impede understanding or meaning of text.

ELA refers to English Language Arts.

ELLs means English Language Learners.

Engagement refers to active involvement.

Graphic organizers (GOs) are visual displays of concepts designed to convey meaning of learned material.

Inherent qualities refer to something existing as a permanent and inseparable element.

LEP means limited English proficient.

Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action (Senge, 1990).

NAEP refers to the National Center for Education Statistics that assesses what students know and can do in various subjects. Results become the Nation's Report Card.

NCLB refers to No Child Left Behind Act of 2001 Elementary and Secondary Education Act (ESEA). NCLB is designed on the following principals: accountability for results,

more choices for parents, greater local control and flexibility, and an emphasis on using scientifically-based research methods (NCLB, 2001-2005).

Race to the Top (2009) refers to the Assessment Competition that supports state governments to implement common standards by funding the development of a new generation of common assessments aligned to those standards.

Schema refers to how knowledge is structured and cognitively represented.

SIOP is a framework for instructing ELLs known as the Sheltered Instruction Observation Protocol (Echevarria & Short, 1999).

Teaching strategies are methods that facilitate student learning.

Thinking Maps® are eight visual tools, each based on a fundamental thinking process and used together as a common visual language (Hyerle, 1996). Thinking Maps, Inc. claims trademark protection on the term "Thinking Maps."

Urban-Suburban refers to districts which comprise the state's major population centers outside of the metropolitan area and their immediate surrounding suburbs.

Visual tools refer to concept maps, visual representations, graphic organizers or the eight Thinking Maps.

Chapter Summary

This chapter highlights the significant aspects that influenced the study. The alarming statistical data available portrays ELLs as the students most "vulnerable and pressured" to perform in American schools. Teachers are ill-prepared to fully support the education of ELLs, especially if these students are to meet a rigorous higher-order thinking curriculum (Curran, 2003). These students require more than vocabulary if they

are to meet academic learning standards. They will need tools that will help them navigate complex text and tasks.

The examination of how a cognitive model such as Thinking Maps may influence how teachers work with these students can contribute to the field of education. Anecdotal reports indicate that the use of Thinking Maps positively affects these students' learning. The research will question how this phenomenon helps ELLs. What is it that teachers do? What does the literature say about cognition, second language learning, and cognitive tools?

Chapter 2 contains a literature review and theoretical perspectives regarding the issues as well as the challenges presented in the research. Chapter 3 and 4 describe the methods used to conduct the investigation for this study and Chapter 5 reveals the researcher's findings and provides recommendations for future research and possible practices for school systems to consider.

Chapter 2: Review of the Literature

Introduction and Purpose

Over half of the seats in the U.S. public schools are occupied by Hispanic students (Fry, 2006), which means that most teachers today work with students of diverse languages and cultures and face the challenge of making academic content accessible and meaningful for ELLs. How will teachers help ELLs achieve?

Abedi and Dietel (2004) reviewed the impact of the NCLB that required all children, including ELLs, to reach proficiency in English by 2014. These policies have imposed new challenges on the most challenged and pressured to perform, ELLs. Both the NCLB and Race to the Top (2009) regulations expect ELLs to gain proficiency quickly and competitively; yet there is virtually no mention in the Race to the Top legislation of how to support educators in relationship to their linguistically and culturally diverse students, especially ELLs.

The researcher was motivated to conduct this study by one of the most compelling challenges in education today: how to raise academic achievement among ELLs. The existing research indicates that historically ELLs' performance on assessments is low or slow to improve in an era of high standards and accountability (Abedi & Dietel, 2004; Chamot, 2009; Cummins, 2000; Echevarria, Short, & Vogt, 2004; Goldenberg, 2008; Scarcella, 2003). Francis, Rivera, Lesaux, Keiffer, and Rivera (2006a) found:

> By 2015, it is projected that 30 percent of the school-aged population in the U.S. will be ELLs. The largest and fastest-growing populations of ELLs in the U.S.

consist of students who immigrated before kindergarten and U.S.-born children of immigrants. (p.3)

Most ELLs in America were born in America. Their deficiencies in academic language described by Francis et al. (2006) — and subsequent failure in subject matters taught in schools — are the result of deficiencies in American schools.

Fitzgerald (1995) argues that the quantitative differences indicated in prior theories between ELLs' learning processes and those of native English speakers require re-examination; because the research does not consider the unique instructional factors for language development, literacy and academic achievement of ELLs. These factors include language and learning strategies as well as the amount of time required for students to acquire the second language. Fitzgerald states that researchers need to examine best practices and identify the gaps between theory and practice in order to reverse the low academic achievement rates of ELLs.

Researchers agree that high quality instruction for ELLs to develop language skills and to achieve academic excellence is crucial in order to sustain a productive society (Jamilah, 2000). Experts do not agree, however, on the best instructional strategy to teach this population (Norton & Toohey, 2001). School districts in various regions of the United States that have implemented Thinking Maps report significant achievement gains in the area of language arts; however, little research has been made available as to how teachers implement the Thinking Maps as a cognitive visual tool specifically to teach ELLs. This study provides such research. The researcher examined how the academic language development of ELLs is achieved using this cognitive tool.

Review of the Literature

During the 1970s and 1980s James Cummins did extensive research on how people acquire language. In his influential work in establishing Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP), Cummins (1979) clearly distinguishes between ELLs developing conversational fluency in the second language and grade-appropriate academic proficiency in that language. Critics of Cummins' theory of the conversational/academic distinction in language contend that the model ignores its application in social practices and power relations (Edelsky, Hudelson, Altwerger, Flores, Barkin, & Jilbert, 1983; Wiley, 1996). Edelsky, et al. (1983) argue that CALP's intention was focused on students' ability to be smart only at taking tests. The argument regarding BICS/CALP appears to remain controversial as it relates to academic achievement among ELLs.

Similarly, the arguments to determine if bilingualism (learning and knowing two languages) is beneficial for a student's ability to learn offered so many different opinions, that the literature may have obfuscated how best to instruct ELLs. Early research did not support bilingual education; however, additional studies over time showed positive results. Cummins and Swain (1986) offered a model known as *Dual Threshold* to illustrate the significance of bilingual proficiency. The model reveals a correlation between students who have average proficiency in one or more languages and average cognitive ability. Students who achieve higher levels of proficiency in two or more languages exhibit above average cognitive abilities (Cummins & Swain, 1986). Bialystok (2001) suggests that students learning a second language can transfer skills between the native language and the second language. As bilingual learners, their meta-

linguistic skills and divergent thinking emerge. García, Kleifgen, and Falchi (2008) qualify ELLs as "emergent bilinguals":

> English language learners are in fact *emergent bilinguals*. That is, through school and through acquiring English, these children become *bilingual*, able to continue to function in their home language as well as in English, their new language and that of school. (p. 6)

Understanding the English language learner as emergent bilingual has implications for teaching and learning; however, this study is not intended to examine instructional program designs or make comparisons among bilingual education, English as a Second Language programs or other types of instructional models. This study's primary focus is to examine how cognition and academic language learning might improve academic achievement among ELLs, also qualified as "emergent bilinguals." The rigorous academic content that these students need to learn, not to mention the assessments they need to take to demonstrate progress, is overwhelming; and achievement data for this student sub-group demonstrate that they are making very slow progress (NAEP, 2008). It is imperative, therefore, to closely examine what works to teach ELLs (Goldenberg, 2008).

Cognition and ELLs. The current research on teaching ELLs supported by Short, Echevarria, and Powers (2006), Thomas and Collier (1997), Chamot (2009) and many others offers a number of reasons to value a deep understanding of BICS and CALP as these models relate to academic language and cognitive development for ELLs. August and Hakuta (1997) address how current theories "share the important claim that academic language is different from language use in other contexts" (pp. 36-37). It is

evident, then, that there is a need to identify strategies to support ELLs. In other words, academic language must be taught explicitly. Freeman and Freeman (2009) state: "English language learners not only need to develop conversational fluency, but also need to learn the academic English that is valued in schools" (p. 42).

The literature on best instructional practices demonstrates that teachers should teach ELLs through explicit, cognitively complex, academic language and school-related tasks. Linan-Thompson and Vaughn (2007) point out, "Teachers who teach explicitly also make relationships obvious among concepts, words, or ideas to help students see the link between prior learning and new learning" (p. 3). Best practices for teaching ELLs rely on cognitive science, that is, the thinking process as identified by Snow (2002), Short (2004), Calderon (2007) and Chamot (1986). Willingham (2009) describes thinking as "knowing how to combine and rearrange ideas in working memory, thereby allowing access to long-term memory for learning" (p. 12). The key for educators of ELLs is to find ways to explicitly activate long-term memory for both language acquisition and content knowledge, as well as to identify the tools that facilitate this learning approach.

Snow, Burns, and Griffin (1998) underscore the importance of language and literacy development for achievement; however, the literature gives limited attention to the explicit instruction of cognitive processes. Chamot and O'Malley (1986), two prominent researchers on the education of ELLs, developed a model to focus on explicit cognitive skills for language acquisition: Cognitive Academic Language Learning Approach (CALLA). The CALLA model includes several instructional strategies and protocols for educators to consider. In her latest edition, *The CALLA Handbook: Implementing the Cognitive Academic Language Learning Approach,* Chamot (2009)

refocuses our attention firmly on cognition and language and explicit instruction. The model confirms that explicit teaching of thinking processes and academic language is essential for ELLs to be successful in school. According to Chamot (2009), "Academic language provides a focus for learning strategies instruction" (p. 41). Chamot reminds readers that there has been a failure to provide initial cognitive and linguistic success in the first language and inadequate curriculum or teachers' professional development to help ELLs make meaning of content learning in the second language.

To "make meaning" requires that teachers of ELLs focus on cognition, i.e., the thinking that supports a learning task. Chamot (2009) makes the case for the need to focus on academic language, thinking processes, and strategies:

> There are five important reasons for focusing on academic language skills: 1) learning to use academic language effectively is a key to success in content areas, 2) academic language is not usually learned outside the classroom setting, 3) content teachers may assume that all their students already know academic language, 4) academic language provides students with practice in using English as a medium of thought, 5) English learners may need assistance using learning strategies with academic language… (p. 39)

Academic language is the outgrowth of thinking, a "medium of thought" as Chamot (2009) characterizes it. The meaning of content can emerge or develop only when learning experiences are delivered in the context of thinking. Marzano (2000) explains: Thinking and reasoning are essential for content to have value (e.g., comparing and contrasting, analyzing relationships, classifying, and making inductive and deductive conclusions.) These thinking processes are precisely what the Thinking Maps model.

The eight Thinking Maps represent (a) defining in context, (b) whole/part spatial relationships, (c) describing attributes, (d) sequencing, (e) comparing/contrasting, (f) cause and effect, (g) classification, and (h) making analogies/metaphors (see Appendix C.)

As previously stated in Chapter 1, most ELLs are of Spanish-speaking backgrounds. The use of Spanish when implementing Thinking Maps is worth noting. Each of the maps is associated with a specific cognitive term and function (see Appendix C.) These terms are also academic vocabulary that serve as cognates in both Spanish and English; for example, the Thinking Map used to "describe" is called *describer* in Spanish; the map for sequence is called *secuencia*; cause and effect is called *causa y effect*; and so on. According to Montelongo, Hernández, Herter, and Cuello (2011), "Cognates are words that are orthographically, semantically, and syntactically similar in two languages because of a shared etymology" (p. 429). Research conducted by Garcia and Nagay (1993) points to substantial evidence that ELLs benefit from cognate recognition to comprehend the second language. Teachers, too, can avail themselves of the rich native language of Spanish-speaking ELLs to transfer concepts. The effect of transfer regarding the names and purposes of Thinking Maps from the Spanish language into English may have been significant for the teachers of ELLs participating in this study.

There are different ways to organize the various schools of thought on thinking and there is overlap among many of these concepts; however, a clear understanding of how the brain functions for learning is essential if teachers are to match their understanding of how the brain works to instructional practice (Wolfe, 2005). Wolfe's explicit connections between concrete experience, representational learning and abstract

learning is consistent with the overarching best practices identified by many specialists, including Snow (2002), Short (2004), Calderon (2004) and Chamot (1986), to teach ELLs.

Academic English addresses many levels of thinking across all subject areas such as math, science, and economics (Johns, 1997). Kern (2000) describes four different dimensions of academic literacy: (a) linguistic, (b) cognitive, (c) socio-cultural, and (d) psychological. Kern's main point is that the study of literacy demands attention to these four dimensions. He argues that anything less falls short of the learning experience. There is a need, he concludes, to ensure that the teaching and learning experience is explicit and intentional, where sources are questioned and opinions are evaluated (Kern, 2000). Scarcella (2003) reminds us that for development of academic language, "[t]he cognitive dimension of academic English minimally includes knowledge, higher-order thinking, cognitive and meta-cognitive strategies" (p. 22). A teacher's ability to tap into the student's multiple ways of knowing, therefore, is essential to meet the cognitive demands of learning in school.

Echevarria and Short (1999) developed the Sheltered English Observation Protocol (SIOP) to facilitate high quality instruction of ELLs for academic language in the content areas. Much of the SIOP design was based on Chamot's CALLA model, emphasizing the link between language acquisition and cognition. The SIOP model is endorsed by many school districts and state education departments as the recommended practice for teaching ELLs; yet, in their most recent book, *Making Content Comprehensible for English Language Learners*, Echevarria, Short and Vogt (2004) claim that "content-based English as a Second Language (ESL) instruction…has not been

sufficient to help ELLs succeed academically" (p. 7). The authors of the SIOP model, therefore, created a structured lesson design framework, including the use of a myriad of strategies. These strategies include met-cognitive strategies, cognitive strategies and social/affective strategies. Among the SIOP strategies is the use of graphic organizers (GOs) for language and content knowledge acquisition.

Gersten and Baker (2001) also mention the importance of GOs. They are an essential component of both the CALLA and SIOP models designed to increase language development. Gersten and Baker (2001) maintain, "[h]owever, [that] even the simple integration of visuals is drastically underutilized; and it seems that, even when used, methods are typically inconsistent or superficial and do not support students' deep processing and thinking" (p. 9). While the recommendations for the use of GOs are plentiful, there is little direction in the literature for teachers and students to effectively apply them. Rice (1994) reinforces this concern when she writes:

> The findings suggest that currently there is no systematic approach to analyzing graphic organizer research resulting in a lack of explanations for why graphic organizers work or do not work… Further, instructional implications are tenuous at best due to the lack of explanations of how graphic organizers work or do not work. (p. 39)

There are so many types of GOs that teachers and students tend to decide on their own which one to use, without knowing the cognitive purposes of each. Jiang and Grabe (2007) recommend more research: "The lack of research with L2 [second language] readers is apparent, and explorations of the effects of GOs with ESL students and students of English as a foreign language (EFL) are especially necessary" (p.46). In the

same study Jiang and Grabe identified several issues concerning GOs: (a) lack of clarity regarding their instructional purposes and what they look like, (b) inconsistent visual designs, and (c) no specific type of GO is more effective for student learning than the next. Griffin and Tulbert (1995) add to the critique, "GOs have taken the form of anything from hierarchical listings of vocabulary terms to elaborate visual-spatial displays with accompanying descriptors and phrases" (p. 86).

Understanding the depth of words, text, and the knowledge embedded in academic learning is a critical factor in thinking. Scarcella (2003) writes, "Academic English is dynamic in the sense that it is continually evolving and shaping meaning in educational contexts that are themselves ever-changing" (p. 9). Helping ELLs to activate their thinking, regardless of the level of language proficiency, is fundamental for them to make meaning of learning. The acquisition of academic language is necessary to advance the development of everyday learning experiences. It makes sense to examine how cognitive models and academic language intersect to support the achievement of ELLs. Patricia Wolfe (2005) claims that "the most powerful strategies increase retention, understanding and students' ability to apply the concepts they are learning" (p. 131). She promotes tools and activities that help the brain recall, discern important information, understand, and apply concepts. Such tools and activities are particularly significant for teaching ELLs. Giving students specific "brain-based" visual tools help them to make meaning of academic tasks could turn the tide of low academic achievement among ELLs.

This study, therefore, focuses on the effects, if any, of teachers' implementation of cognitive models, in particular Thinking Maps, on the development of academic language among ELLs.

Concept maps to graphic organizers to Thinking Maps. In *Design for Thinking*, Upton (1973) emphasizes that "…language behavior is the key to understanding, and that the most important thing about language is meaning…" (p. 11). Upton's vision has transformed teaching and learning for all students through an explicit focus on thinking processes, language development and meaning. Upton claims that fundamental thinking skills might be more easily understood as a visible, concrete pattern of thinking. Novak and Cañas (2007) argue that graphical tools for organizing and representing relationships are an effective way to ensure meaningful learning. Similarly, and fundamental to their study, Short, Echevarria and Powers (2006) cite GOs as a key strategy for teaching ELLs. Teachers have traditionally used a variety of GOs and often the GOs simply serve as a container for information. Jiang and Grabe (2007) strongly recommend the use of GOs, "…which directly represent the discourse structures of a text, provide stronger evidence for the effectiveness of the technique, and…should be adopted in comprehension instruction" (p. 1).

Visual tools appear to have enormous implications for helping students make meaning of academic language and content (Hattie, 2009). Visual tools are essential to Chamot's (1986) CALLA model. Scarcella (2003) argues with certitude that "strong proficiency in academic English coupled with higher-order thinking enables learners to read academic text critically" (p. 23). ELLs' ability to manage complex text is essential for their success in school.

What is unique to Thinking Maps? Thinking Maps are based upon cognitive processes needed to understand the information conveyed, and are thereby distinguished from GOs (Hyerle, 1996). Thinking Maps appear to engage teachers and students in a constructivist approach by making explicit connections among thinking, meaning, and learning that are consistent with brain research (Huitt, 2009). It appears that Thinking Maps encourage teachers and students to construct knowledge (Hyerle 1996). This approach seems to be embedded in the Thinking Maps, in that the learner constructs the maps as they acquire the knowledge. Jiang and Grabe (2007) confirm the importance of construction in learning:

> The active involvement of readers in constructing a GO, even simply finishing a partially complete graph, provides them an opportunity for deeper processing of the material than studying organizers produced by others. (p. 42)

The benefit of constructing a visual tool is corroborated by Tang (1992). In Tang's study one group of ELLs was given a GO fully developed by the teacher and a second group of ELLs was given a partially completed GO. The second group of ELLs was expected to construct their own GOs. Tang concludes that the students who engage in completing their own GOs do better in assessments than the students who learned from completed GOs.

The theory of constructivism makes these same explicit connections when it combines inquiry-based learning, cognitive apprentices and cooperative learning and discovery. David Hyerle (2009) confirms the argument that the use of visual representations during instruction supports student learning; and visual learning strategies improve student performance through explicit connections.

The Art and Science of Teaching by Robert Marzano (2007) strongly supports the efficacy of such non-linguistic representations for learning. In fact, Marzano praised Thinking Maps explicitly in the forward to Hyerle's book: *Visual Tools for Transforming Information into Knowledge* (2009) where he wrote:

> I reviewed a number of studies focusing on what I referred to as nonlinguistic representations. This term included instructional strategies such as graphic organizers, mind maps, and the like. The research I reviewed strongly supported the use of such strategies as powerful instructional tools…. David Hyerle has expanded the frontiers of strategies involving nonlinguistic representation far beyond what others and I have attempted to do. (p. viii)

Additionally, the Thinking Maps are implicit in Piaget's (1967) theories of the constructive nature of learning. Thinking Maps integrate language that draws together ideas by uniting other representation systems such as verbal, numerical and pictorial forms into patterns (Hyerle, 1996). Piaget's theory of cognitive development is of particular significance for teaching and learning English; because it takes into account the individual learner's active involvement in constructing meaning through expressive and receptive language.

Critics maintain that while Piaget's information processing approach provides a good way of assessing intelligence and gathering information about memory development and other cognitive processes, his approach does not take into account the importance of creativity and social interaction (Paplia, Olds, & Feldman, 1998). Nevertheless, Piaget's approach is central to the evolvement of cognitive theory known as *cognitive constructivism*. Constructivism makes explicit connections among the

activities of thinking, meaning, language, and learning. The Thinking Maps engage teachers and students in a constructivist approach (Huitt, 2009) to inquiry-based learning and discovery among ELLs that is consistent with brain research. Freeman and Crawford (2008) remind us:

> To be academically successful in school, ELLs must not only learn a new language and integrate with a different culture, but concurrently must learn and master a range of academic content including mathematics and science in that new, nonnative language. (p. 12)

Without an understanding of basic academic concepts that teachers often take for granted, ELLs lack the structure on which to hang academic content. Vygotsky's (1986) social-cultural theory and his concept of the zone of proximal development (ZPD) indicate the need to scaffold instruction (as a form of constructing learning) to support meaning incrementally.

Scaffolding instruction is required for ELLs (Jaramillo, 1996); and this is precisely what the use of Thinking Maps accomplishes. David Hyerle (2009) argues that visual learning strategies improve student performance through explicit connections and build content knowledge as conceptual understandings from broad to specific categories. Actively forming complex "mental models" (Senge, 1990), therefore, is grounded in complex visual patterns of thinking. When ELLs create and use such visual models, deeper meaning and thinking can result (Hyerle & Williams, 2010). Dr. Stefanie R. Holzman carefully described how Thinking Maps affected her teaching staff and her school's population of ELLs (Hyerle, Alper, & Wolfe, 2011). Every teacher in the school used Thinking Maps for teaching and learning. Dr. Holzman observed:

> Learning content while learning a second language is a complex process. It is frustrating for a child to have ideas, vocabulary, and rich patterns for thinking in one language that are not immediately translated and understood by teachers in the context of the classroom. This is because the acquisition of a second language obviously gets in the way of students' thinking and learning. The Thinking Maps become the translator for language and thinking from one language-mind (Spanish) to another language-mind (English). Thinking Maps became our first language for *thinking* thus supporting the [different] languages, content learning, and cognitive development of our multilingual population. (Hyerle, Alper & Wolfe, 2011, p. 124)

The essential claim in cognitive learning theory is that learning happens through active, dynamic mental processes. Learners select information from their environment, organize that information, and make connections based on prior knowledge. Linguist Anna Chamot echoes psychologist D. T. Willingham's (2009) description of how the brain learns when she suggests that concept maps are an effective tool to explicitly activate long-term memory for language acquisition and content knowledge. Chamot (2009) links cognition, relevancy, and language acquisition in a tight theoretical framework that supports the use of the Thinking Maps to teach ELLs. Chamot asserts:

> Cognitive theory can help teachers understand how a student is processing information, what connections the student is making to prior knowledge in the first language, and beliefs the student has about learning a new language. (p.7)

Snow, Met, and Genesee (1989) agree that for ELLs relevance in learning is necessary and must not be taken for granted. ELLs are highly motivated when they "see"

the value of learning to use English, not only to meet everyday needs but also to communicate in the academic content areas. Angela Solomon (2008) writes:

> Learning to read involves a series of cognitive strategies and skills that go far beyond isolated skills**.** The use of thinking routines enhances children's language and literacy as children have the opportunity to activate their thinking and to externalize their thoughts, using L1 (native language) for deep thinking and L2 (second language) to share with the class. (p. 139)

Goldenberg and Coleman (2010) reinforce the need to focus on academic language because "it is the language of textbooks, lectures and discussions about academic content" (p. 62). They continue to remind us that language is more abstract and concepts are complex. Goldenberg argues that although ELLs may read (decode), write, and speak about English materials, if they do not have "the academic language skills to comprehend the various curriculum contents …they are at a serious disadvantage" (p. 92). Both Lyster (2007) and Scarcella (2003) reinforce the reciprocal connection between academic language and content learning.

The teacher effect. The role of the teacher is the primary factor for ELLs' improved academic achievement. In his book, *Focus: Essentials to Radically Improve Student Learning*, Michael Schmoker (2010) highlights fundamental elements of teachers' practices to positively affect the learning experience of their students: clear learning objectives, teaching/modeling and demonstrating guided practices, and constant checking for understanding (Schmoker, 2011; Chamot, 2009). These elements correlate with the purposes of the Thinking Maps. In fact, the literature on Thinking Maps indicates that these visual tools shape a teacher's pedagogy. In Hyerle and Alper (2011)

Kathy Ernst, a professional development coach in an urban school district, described in detail how the use of Thinking Maps contributed to improving teachers' lesson planning and delivery of instruction. According to Ernst:

> The maps not only facilitated explicit thinking and learning throughout the process of our planning, observation, and debriefing; but they served as visual imprints, the Habits of Mind that are inherent to what Linda Lambert (1990) asserts is the daily work of highly qualified teachers: reflection, dialogue, inquiry, and action. (Hyerle & Alper, 2011, p. 190)

Schmoker (2010) identifies the importance of simplicity, clarity, and priority within a learning environment. He also advocates "simplicity and diligence" (Schmoker, 2011, p. 17) with special attention to how and what teachers teach.

Indeed, the implementation of a common set of processes that promote optimum teaching and learning of this kind across the entire curriculum of a school may reduce the academic failure rate among that school's population of ELLs. To do so, however, requires that teachers understand the power of cognition in the teaching and learning experience, specifically as it relates to their ELLs. This study analyzed how teachers perceive, interpret, and understand the implementation of the Thinking Maps in their instructional practice to teach ELLs.

Summary and Conclusion

There is clearly an urgency to address the educational needs of this vulnerable student population. Discovering what works to teach ELLs merits careful study. The literature regarding second language learning and cognition makes it clear that focusing on the cognitive development of ELLs is a promising avenue of inquiry. Given

Schmoker's (2011) position on a reasonable, rigorous and coherent curriculum, well constructed lessons, and "purposeful" reading and writing, there is evidence that academic achievement among ELLs is certainly possible. The research of Chamot (2009), Cummins (2000), Goldenberg (2008), and others describes an array of opportunities for ELLs to process language and content by means of understanding, open consciousness, and expressive methods of evidence of learning. The literature proves that students, especially ELLs, can negotiate language and meaning through content by means of peer interaction and strategies involving teacher scaffolding and student feedback. The Thinking Maps seamlessly integrate this negotiation of language, learning concepts, and strategies.

After careful review of the literature, a qualitative design appears to be the most appropriate method for this study. The research tests the hypothesis that the use of cognitive visual tools such as Thinking Maps improves the development of academic language among ELLs — based on how teachers interact with the visual tool and subsequently with their ELLs. The following chapter justifies the study's methodology. Ensuing Chapters 4 and 5, respectively, present the results of the study and discuss the implications of the findings.

Chapter 3: Research Design Methodology

General Perspective

The qualitative methods used by this researcher permitted a flexible and iterative approach to the research. While gathering data, the choice and design of methods were frequently modified, based upon constant analysis. This allowed for the investigation of important new issues and questions as they arose, and allowed the researcher to eliminate unproductive inquiries from the original research plan (Cottrell & Mckenzie, 2005). In addition, while the focus of this research was qualitative, the researcher used quantitative methods as well, including a questionnaire designed to collect additional information, demographic data and teachers' perceptions regarding the use of Thinking Maps.

For the growing population of ELLs, the complexity of academic English is an obstacle to the development of higher-level reading and writing skills (Scarcella, 2002). A study conducted by Moss and Puma (1995) for the U.S. Congress reported that ELLs receive lower grades, are judged by their teachers to have lower academic abilities, and score below their classmates on standardized tests of reading and math. Though ELLs as a group have lagged behind the achievement of their grade-level peers according to virtually all the state and local data made public, ELLs represent a very heterogeneous population. Few would disagree that the education of ELLs has been a challenge (Goldenberg 2008). Fewer still would argue against the economic and social significance of providing these students with the best education possible. The mandate for schools to implement new Common Core Standards (CCSO, 2009) as per Race to the Top (2009)

necessitates that ELLs engage in higher-order thinking, thus demanding more of their cognitive ability. Timely and relevant, the study investigated how a specific cognitive model, Thinking Maps, affected academic language development among ELLs.

Research Context

The purpose of this study was to address an overarching question: What do teachers of ELLs do when they apply Thinking Maps to expand ELLs' English vocabulary and academic language comprehension? This question was framed as an empirical question to be answered by administering selected academic tests to ELLs before and after the use of Thinking Maps in their language learning experiences. A randomized, control-experimental group study of this sort would be a desirable contribution to the literature; but while such a study was theoretically possible, it was not practically possible, because the school environment does not lend itself to meeting all the requirements of valid experimental research.

The alternative research method that this researcher proposed to use was based on the assumption that teachers who have extensive experience using Thinking Maps to teach ELLs are a valuable source of understanding the impact that this instructional approach has on academic language learning. The primary source of data for this dissertation, therefore, was the opinions and conclusions of experienced teachers who used Thinking Maps to teach ELLs. Accordingly, this was a phenomenological study.

Rossman and Raliis (1998) state, "[P]henomenological analysis requires that the researcher approach the texts with an open mind, seeking what meaning and structures emerge..." (p. 184). The "text" studied in this research included a set of impressions, perspectives, and beliefs of teachers about ELLs and Thinking Maps. Such a

phenomenological study did not seek a simple yes or no answer to the research question. The study also examined how the theoretical foundations of cognition, second language learning, and concept maps (e.g., Thinking Maps) interrelate. The literature review yielded a deeper understanding for this researcher of how the Thinking Maps might "reveal" ELLs' academic language learning ability and provided context for this researcher's exploration of how teachers apply the maps.

Justification for the research design. The study followed a phenomenological model. This research model is a form of inquiry that permits a researcher to examine and uncover a particular aspect of the "human experience" (Creswell, 2009). Developed by the German philosopher, Edmond Husserl (1859-1938), this philosophical theory and research model focuses on the concrete or "the things themselves" as experienced by humans in a particular context (Eagleton, 1983, p. 56; Kruger, 1988, p. 28; Moustakes, 1994, p. 28). Such research includes descriptions, experiences, and discovery of meaning (Creswell, 2007; Cottrell & Mckenzie, 2005) through an exploration of participants' perspectives on their experiences.

Husserl (1913) indicated that knowledge of the structures of consciousness was not a matter of induction or generalization from a sample, but the result of a "direct grasp" of "eidetic seeing" (p. 42). In other words, this method explores and identifies the basic components or causes of phenomena from the perspectives of the individuals participating in the study, for example, the effects of Thinking Maps in a teaching and learning environment. Creswell (2009) writes, "[the] descriptive method of research is to gather information about the present existing condition" (p. 173). This type of qualitative research made observations and queried respondents to find and build theories that

explained the relationship of one variable (in this case, implementation of cognitive models) with another variable (in this case, academic language development among ELLs.)

In Miles and Huberman's (1994) *Qualitative Data Analysis*, quantitative researcher, Fred Kerlinger, is quoted: "There's no such thing as qualitative data. Everything is either 1 or 0" (p. 40). D. T. Campbell (1984), on the other hand, asserts, "All research ultimately has a qualitative grounding" (p. 40). Qualitative data typically involves words and quantitative data involves numbers; there are some researchers who feel that one is better (or more scientific) than the other. Another major difference between the two is that qualitative research is inductive and quantitative research is deductive. In qualitative research, a hypothesis is not needed to begin research; however, all quantitative research requires a hypothesis before research can begin. In addition, *positionality* of the researcher differs between the two research methods (Winter, 2000). In quantitative research, the researcher is ideally an objective observer who neither participates in nor influences what is studied. In qualitative research, however, the researcher can learn most effectively by participating in the research's enquiry.

Understanding these basic differences between quantitative and qualitative research provided context for the research method used in this study. Qualitative methodology has established validity and reliability in the field of the human sciences (Osborne, 1994). Such methodology, including phenomenology, provides an alternative to the emphasis of natural science on observable data. The application of this research model for the investigation of the implementation of Thinking Maps as a cognitive tool

provided a "story" about how these cognitive tools manifested academic language learning in the teaching and learning experience of ELLs.

Phenomenological methods endeavor to explore conscious experience directly through a specialized form of introspection, rather than inferentially through overt observation. Cognitive science does the same (Osborne, 1994). Phenomenology provides a method for investigating what the participants are experiencing as genuine subject matter (Klein & Westcott, 1994). The link between the dissertation topic and this methodology is significant in that the foundation of both is cognition. In an effort to improve the quality of education for ELLs, an urban-suburban school district in New York implemented the cognitive model known as Thinking Maps developed by Dr. David Hyerle to make academic language and content meaningful for ELLs.

Validity of the methodology. In a phenomenological study the original data are comprised of naïve descriptions obtained through open-ended questions and dialogue. This researcher described the structures of the experiences based on reflective analysis and interpretation of the participants' accounts or interpretations. Interviews were open. Pre-formed questions were open-ended, carefully designed to inquire into the participant's lived experience of the phenomenon under investigation — the use of Thinking Maps to teach ELLs — allowing the respondent the maximum freedom to respond from within that lived experience. Follow-up questions teased out deeper and more detailed elaborations of earlier answers. The objective was to collect data that were profoundly descriptive, rich in detail, and introspective (Van de Walle, Turner, & Davenport, 2003).

To provide background information and situate the study within a meaningful context, the study examined how leadership in the Urban-Suburban School District decided to use the Thinking Maps for the development of academic language and learning. The Urban-Suburban School District in the study has seven elementary schools, two middle schools and one high school. It is one of several urban-suburban school districts in close proximity to New York City. Fifty percent of the district's students are of Hispanic heritage. The student population is diverse with a high concentration of limited English proficient (LEP) students, also known as ELLs. These ELLs are largely from Hispanic backgrounds.

In general, the goal of the leadership in the Urban-Suburban School District was to help faculty use the Thinking Maps as a common visual language and instructional approach across the entire school's curriculum. The first group of teachers trained in the Thinking Maps consisted of English as a second language and Dual Language teachers responsible for the language development and academic achievement of ELLs. Over time, the school's entire faculty was also trained in the use of Thinking Maps, because ELLs are in every classroom.

Teachers noticed how the Thinking Maps enhanced academic language acquisition and achievement among all students over the course of a four-year implementation. The teachers' conversations with this researcher during the early years of implementation focused on the integration of cognitive objectives, cognitive processes, and language processes. The teachers' conversations piqued this researcher's interest because they often commented that no other instructional tool had ever been so engaging for them and for students, especially ELLs.

The study took advantage of this ongoing conversation to provide current data concerning the effectiveness of the Thinking Maps as a cognitive model for the development of academic language among ELLs. The research focused primarily on the teachers' interpretations of their actions regarding the use of Thinking Maps. Results were generalities or commonalities made by teachers about the implementation of the Thinking Maps and the maps' applications to the learning experience of ELLs.

Member checking and peer de-briefer. The researcher asked for participants' views on the credibility of the findings and interpretations. This process is called member checking. Lincoln and Guba (1985) believed that it was important to ensure credibility by returning to the source of the data to check for clarification of responses or to expand on viewpoints.

The role of a peer de-briefer inserted another process designed to ensure credibility and to serve as an external check. According to Lincoln and Guba (1985) peer de-briefers serve as "devil's advocates." The researcher shared her findings with two colleagues with doctoral degrees and one colleague who is currently in a doctoral program. Each provided the researcher with critical questions to assess the meaning and interpretations of the findings.

Research Participants

The recruitment process for a qualitative study is not a technical procedure in which issues such as random assignment to avoid bias are paramount, nor does it pay serious attention to the issue of obtaining a representative sample. These are criteria for empirical studies that collect limited amounts of data from a large number of subjects in order to generalize findings from the sample to the population from which the sample

was drawn. Qualitative research does not use this model and therefore uses a different logic for selecting participants.

The study focused on the experiences of teachers from two elementary schools with the high concentrations of ELLs. The researcher focused on responses from the teaching staff of the two schools selected for the study. One hundred and twenty teachers from the participating schools were invited to complete a survey. A total of 49 teachers responded to the survey. Fifteen of the 49 respondents indicated that they would participate in a focus group; and seven of the 15 respondents self-selected for the focus groups were interviewed individually. This process was critical in that qualitative research involves collecting large amounts of data from a small number of participants (instead of small amounts of data from a large number of subjects.) The teachers that participated in the study had a mix of experience, degree of belief in the effectiveness of Thinking Maps as an instructional strategy for teaching ELLs, socio-cultural backgrounds, and years of teaching experience. The goal, however, was not to ensure that the participants were a representative sample of a particular population, but, instead, to gather data from a diverse group of teachers who work with ELLs and to analyze the data to better understand the participants' views and perspectives on the use of Thinking Maps for instruction.

Recruitment procedures. The superintendent of the Urban-Suburban School District authorized permission to conduct the study (see Appendix F). Each participant signed a consent form (see Appendix G). The researcher collaborated with each school principal. Each principal served as the gatekeeper. The gatekeeper and the researcher encouraged the faculty to participate in the study. The teachers participating in the study

met two important criteria: (a) They were trained in the use of Thinking Maps and had various degrees of expertise; and (b) they worked with ELLs.

A faculty meeting took place at each school where the researcher explained the project to potential teacher-participants and secured each participant's consent. All the teachers were invited to complete a survey. The survey contained 24 questions of which the last requested volunteers to participate in focus groups and interviews. The researcher scheduled teachers were scheduled for interviews during the winter and spring of 2011. There were several cancellations due to winter storms; yet the teachers were eager to participate and made every effort to re-arrange schedules when needed.

Site description. The two participating elementary schools are identified in the study as Elementary School Blue and Elementary School Red. Elementary School Blue is located in one of the poorest neighborhoods of the Urban-Suburban School District. This residential area containes overcrowded housing for large numbers of poor minority residents, many of whom are newly arrived to this country. As of the end of the school year 2009 there are 815 students (see Table 3.1) in attendance at Elementary School Blue: 82% are Hispanic, 8% are African-American, 8% are Caucasian and 2% are Asian. Eighty-two percent (82%) of the students at Elementary School Blue receive free or reduced-cost lunch compared to 38% in the district and 28% in New York State. Approximately 38% of the school register is limited English proficient (LEP) as compared to 11% in the district and 7% in the state. Ninety-five percent (95%) of LEP students at Elementary School Blue come from low-income households; yet, the percent of students that meet or exceed state standards on New York State's English Language Arts, math, science and social studies exams range from the low-80th percentile to the

high-90th percentile. While Elementary School Blue always had a relatively high proportion of LEPs and students receiving free and reduced-cost lunch, this high level of performance on state assessments was not always the case.

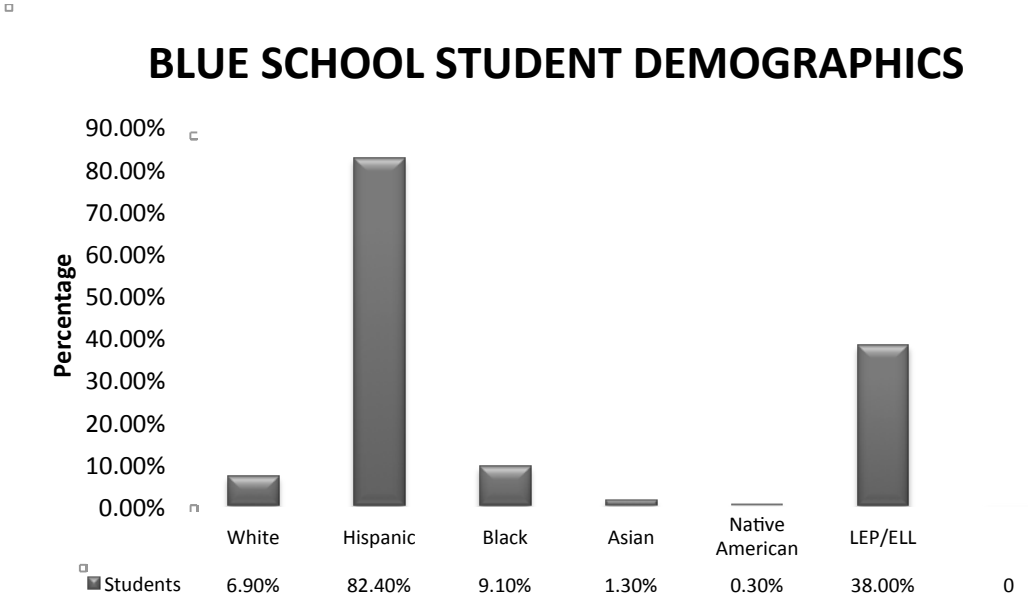


Figure 3.1. Race and Ethnic Demographics for the Elementary School Blue. This figure describes the percentage of the various ethnic student groups and the percentage of the student population in Elementary School Blue considered Limited English Proficient/English language learner (LEP/ELL) for 2009.

Elementary School Red is located in the southeast of the Urban-Suburban School District and the community is mixed socially and economically. The total student population as of the end of 2009 is 543. The student population is predominately Hispanic. In 2009, 17% are African American, 19% are Caucasian, 2% are Asian, 1% are American Indian, and 1% are multiracial (see Figure 3.2.) Sixty percent (60%) of the students in Elementary School Red qualify for free lunch and 11% receive reduced-cost lunch. Stability of the student population is 96%. Twenty one percent (21%) of the students are LEP. Elementary School Red also has moved the English Language Arts

(ELA) scores from the 70th percentile to the 90th percentile over the past seven years. Math scores moved from the 53rd percentile to the 90-100th percentile.

Increased scores are anecdotally attributed to the explicit attention paid to (a) implementation of balanced literacy supporting bilingual education, (b) analysis of achievement, (c) targeted Academic Intervention Services (AIS) using Response to Intervention (RTI), and in particular, (d) the use of Thinking Maps to write curriculum and deliver instruction for deeper meaning in the academic content areas. Both Elementary School Red and Elementary School Blue were ideal sites in 2009 to examine the effects of Thinking Maps in teaching and learning for ELLs.

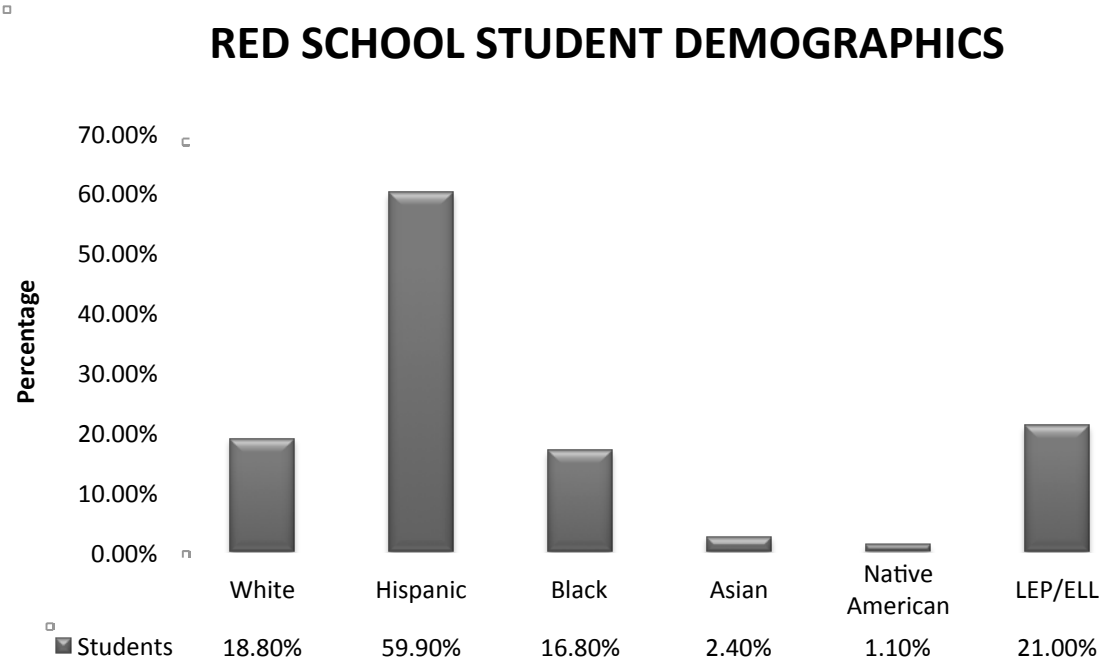


Figure 3.2. Race and Ethnic Demographics for the Elementary School Red. This figure describes the percentage of the various ethnic student groups and the percentage of the student population in Elementary School Red considered Limited English Proficient/ English language learner (LEP/ELL) for 2010.

Both schools implemented the Thinking Maps approach, emphasizing a higher-order thinking curriculum to improve academic achievement for all students, particularly ELLs. As a result, students in these schools began to develop proficiency in critical thinking.

Instruments Used in Data Collection

This study used interviews as the primary source of data. Appendix H lists the interview questions. Two types of interviews were conducted in each of the schools: (a) focus groups and (b) in-depth individual interviews. As previously indicated, 15 teachers (seven from one school and eight from the other) volunteered to participate in a focus group. Seven teachers in total from the focus groups volunteered to participate in in-depth individual interviews. Participation of all teachers was essential to shed light on a number of questions that the researcher had developed. Guiding questions as well as follow-up questions were designed to provide significant and lengthy details of teachers' experiences with the Thinking Maps.

It was critical to make the settings for interviews and focus groups convenient for the participants. In an effort to be sensitive to the nature of teachers' responsibilities, daily activities and busy schedules in a public school setting, the researcher chose purposeful sampling to reach the participants in this study. A survey was distributed among 120 teachers of which 49 completed the questionnaire. Of the 49 respondents, a total of 15 teachers participated in two focus groups: eight participants from one school and seven from the other. A total of seven teachers who participated in the focus groups were randomly selected for in-depth individual interviews. Additional sources of data for this qualitative research included the researcher's field notes, participants' samples of

student work, recordings of discussions, and responses to open-ended questions during interviews.

The researcher used a Likert Scale questionnaire (Appendix I) for the purpose of gathering data on a number of variables prior to the interview process. A phenomenological design allows for the use of a questionnaire as part of the data set (Creswell, 2007). Such a questionnaire can be distributed effectively and responses are readily standardized for easy tabulation. The questionnaire solicited demographic information about the teacher-participants and included questions specific to usage frequency and preferences with regard to the eight Thinking Maps, including the Frame of Reference map.

The questionnaire consisted of two parts. The first part included a set of categorical questions about respondents, such as number of years teaching, level of experience working with ELLs, and level of expertise using the Thinking Maps. The second part of the questionnaire investigated how the maps' frequency of use affected the teaching and learning experience and if teachers had particular preferences for any of the eight Thinking Maps. In addition, several questions assessed teachers' perceptions of the relationships between the affective domain of students and the academic language proficiency of students after using Thinking Maps.

Validity and reliability. As discussed above, the instruments for the research included in-depth interviews and a questionnaire. The researcher used a questionnaire during fieldwork in order to examine the variation and types of questions, bias and other features in order to provide validity and reliability. This researcher's fieldwork also included evaluation and adjustment for validity and reliability of a variety of open-ended

questions. The dissertation committee and five professional peers (colleagues with doctorate degrees who serve as superintendents of schools or college professors) reviewed and validated these sample questions to assist the researcher to remove unproductive open-ended questions from both interview questions and the questionnaire.

Procedures for Data Collection and Analysis

Each of the research questions required its own method of investigation. For instance, the question, "How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?" was addressed through a questionnaire to assess which of the maps are used most frequently, as well as interviews that may reveal insights about the effects of usage frequency and application of the maps on teaching and learning with ELLs . The next two questions — "Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?" and "Are there specific strategies and methods of using Thinking Maps that support particular goals and objectives?" — were addressed through focus group discussions followed by in-depth individual interviews that elicited how teachers actually use the Thinking Maps in their classrooms.

This qualitative study sought to describe and uncover the meanings of the central themes in the experiences of the participants as they use the Thinking Maps (Kvale & Brinkmann, 1996). Interviews proved useful for getting the narrative behind participants' experiences. The goal was to use a general interview guide to ensure that the same general areas of information were collected from each interviewee, thus providing more focus than the conversational approach.

Data collection activities took take place during a five-month period from December 2010 to May 2011. Upon confirmation of participants, the researcher was better able to outline a reasonable timeline so that the schedule for the interview process, transcription, analysis of data and verification of results was manageable and able to meet the research deadlines. A "progress monitoring" map and documentation of all activities was developed, logged and dated.

The questionnaire provided a quantitative dimension for the study. A typical item was a Likert Scale or statement by which respondents were asked to indicate their degree of agreement or disagreement. Traditionally a five-point scale is used, however, many psychometricians advocate using a seven- or nine-point scale (Hodge & Gillespie, 2005). Each item was analyzed separately and responses were coded.

The online survey program, SurveyMonkey, facilitated calculations of this data prior to analysis in SPSS (an application used for survey authoring, deployment data mining, and text analytics.) During this researcher's fieldwork, the questionnaire and the open-ended questions for the interviews were revised based on feedback from expert professionals. This practice ensured clarity of content and direction, as well as ease of administration.

The bulk of the study consisted of in-depth, personal interviews. The researcher transcribed interview text with the assistance of a research assistant. All transcribed interviews were broken into coded segments representing complete thought statements. After coding, all of the interview segments were stored in SPSS. This application helped the researcher to organize and analyze transcripts of interviews and focus group

discussions by counting and sorting coded statements to reflect themes that emerged in all of the interviews (Kvale & Brinkmann, 1996).

Open-ended questions served as prompts during the interviews. The SPSS software facilitated the researcher's ability to discern patterns, trends and comparisons in the data. The researcher incorporated participants' feedback to support accuracy in interpreting data, thereby guiding the researcher to develop a set of principles or standards with which to reach valid conclusions.

With regard to coding, the researcher looked for ideas and themes that emerged from the data. The coding process combined the collected data. Codes served to label text, making it easy to retrieve for comparison and analysis (Strauss & Corbin, 1998).

The three data sets (the survey, focus groups and interviews) provided significant insights into how the use of Thinking Maps accelerates the acquisition of academic language among ELLs. The results yielded tables and figures depicting coded responses, frequencies of codes and significant findings organized as themes in the following chapter.

Chapter 4: Results

Research Questions

As described in Chapter 1 this study examined the way teachers in two elementary schools working with large numbers of Hispanics, of which many are ELLs, focus their instruction to influence the higher-order thinking of their students through the implementation of a cognitive model: Thinking Maps.

The study was conducted in two Elementary Schools located in an urban-suburban school district in Westchester County, New York. For the purpose of anonymity, we identified the schools as the Red School and the Blue School. The schools selected met two specific criteria. Firstly, these schools had a high percentage of ELLs; therefore, questions were designed to elicit information about this sub-group of students. When teachers responded to the questions they used the terms "students" and "ELLs" interchangeably. Secondly, the participants in the study were teachers who received training in using Thinking Maps. This chapter contains a descriptive analysis of the results of the study.

The three broad research questions under investigation for this study are as follows:

1. How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?

2. Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?

3. Given the different goals and objectives with which teachers engage ELLs in academic vocabulary development and comprehension, are there specific strategies and methods of using Thinking Maps that support these particular goals and objectives, which lead to academic language learning?

The three research questions address teachers' perceptions and abilities with regards to Thinking Maps and their effect on the academic language of ELLs. A variety of data sets were collected for this qualitative study, including a brief survey containing both quantitative and qualitative elements, focus group interviews, individual interviews, and researcher's notes taken during meetings with teachers.

Data Analysis and Findings

The survey results (collected in SurveyMonkey) served several purposes. First, they provided a backdrop of the descriptive statistics of the study sample from which focus group and interview participants were selected. These quantitative results lend themselves to straightforward presentation and interpretation. Second, they were used to support (or refute) the findings in the qualitative data around key research areas. Third, they provided direct insight to one or more of the broad research questions under investigation.

Although some of the survey results are quantitative, they are not intended for bi-variate analysis; because the nature of the research questions does not invite such

analysis. The focus of the study in its entirety is on the phenomenological findings within all of the sources of data.

The data generated during the focus groups and individual interviews were audio-recorded, transcribed, sorted, and coded. Quotations files were created into which those statements from the transcriptions judged by the researcher to be relevant or poignant were stored for coding. Finally, these coded quotations were carefully split in order to preserve their original contexts and meanings, such that each entry related to a single code. These entries were then transferred to SPSS software for production of bar graphs to show the frequencies with which codes and themes are repeated throughout the texts. While originally this researcher was going to use Envio software to analyze interview data, it seemed more efficacious to use SPSS software for this type of study. The researcher determined the codes by an inductive process, which entailed summarizing ideas contained in the quotations files. Codes and themes were sorted, matched, and refined with repeated review of the data. A research assistant and two external reviewers provided third-party confirmation of all coding decisions. The codes and themes revealed five significant factors that address the research questions. They are summarized and identified as: (a) inherent qualities, (b) teaching strategies, (c) assessment, (d) academic language, and (e) engagement.

This chapter begins with descriptions of respondents and overall details on responses in the various modes of data collection. Subsequent sections of this chapter will present survey, focus group, and interview data, as they are relevant in addressing each of the broad research questions.

The Survey

The two schools in the study were given 120 surveys (in total) to be completed. Originally, the study was to have made a convenience sampling of 16 survey responses; instead, the entire faculty of each school was invited to take the survey. A total of 49 participants responded to the survey. The vast majority of them (96%) confirmed that they had participated in at least one day of formal training on Thinking Maps. (This participation was a selection criterion for the study's sample.) Of the two participants in the survey who reported not having had this training, one reported having had no in-school training on the Thinking Maps. This respondent's responses were withheld from all further analysis. The other respondent met the study's sample selection criterion for training on the Thinking Maps with in-school training, and this respondent's responses were retained for analysis.

Of the 48 valid respondents, six were male and 42 were female. All but one of these teachers reported having more than three years of experience in their profession, with the bulk of respondents (about 85%) reporting teaching experience of seven or more years (and one reported having had one to three years of teaching experience). Their experience is spread fairly evenly over the elementary grade levels, with more than 90% of the multiple responses indicating teaching experience in kindergarten through fifth grade. Only nine of the multiple responses were for pre-kindergarten. The teachers who responded to the survey had varying levels of experience with ELLs, as Table 4.1 illustrates.

Table 4.1

Types of Programs Taught

		Responses* N	%
Type of Programs Taught	Mainstream Class	32	43%
	Bilingual Class	14	19%
	ESL Only	7	10%
	Inclusion Class	11	15%
	Dual Language	5	7%
	Other	5	7%
Total		74	100%

* Multiple responses per respondent were possible with n = 47 respondents.

Textual Data

The focus group was conducted with purposefully selected respondents. This researcher had planned to conduct focus group sessions with eight participants from each of the two schools; however, due to conflicts with teachers' schedules and personal responsibilities, Elementary School Red had five participants and Elementary School Blue had eight. This change did not alter the number of participants required for a valid study.

From the transcriptions of the focus groups, 261 individual statements were selected to create or were found to belong to one of the relevant themes and codes. Five individual interviews were conducted with seven self-selected respondents from the focus groups (two interviews were done with a pair of teachers.) The self-selection process, as described in Chapter 3, was done by asking for volunteers willing to participate in

individual interviews. From the transcribed interviews, 398 individual statements belonged to one of the relevant themes. Of the 48 survey responses, 21 respondents made comments; and from these, 34 individual survey comments were identified. This researcher identified 45 individual themes and codes. The themes and codes are represented in tables and figures within this chapter and in the Appendix.

Identification of Themes

The data collected had many codes that were organized into five themes (see Appendix J.) These themes summarized the numerous comments of the participants. They reveal unique aspects of the teachers' use of Thinking Maps from their meta-cognitive perspectives, or how the Thinking Maps affect teachers and their ELLs. The purpose of these labels used in the analysis of the data, furthermore, was to connect the data to the three main research questions. The themes are presented in Table 4.2; and Figure 4.1 illustrates explicitly the alignment of the themes to the data sources and most importantly to the three research questions. Together, these representations synthesize the results in a systematic manner.

Each theme carried with it a list of more specific codes that were applied to the quotations files. The researcher has presented these detailed codes within the contexts of their relevant research questions. Moreover, as means to substantiate the significance of the codes, the researcher has included quotes from respondents as evidence of meaning and interpretation.

Table 4.2

Descriptions of Themes

Theme	# of Associated Codes	Description of the Theme
1. Inherent Qualities (refers to something existing as a permanent and inseparable element)	(16)	Inherent qualities that promote thinking, academic language, vocabulary and learning*:* There are inherent qualities for which Thinking Maps directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.
2. Teaching Strategies (refers to methods that facilitate student learning)	(7)	Specific and explicit teaching strategies of the Thinking Maps**:** There are teaching strategies that engage ELLs in the use of Thinking Maps to increase their thinking during academic learning, including vocabulary acquisition.
3. Assessment (refers to what a student knows and can do)	(5)	Assessment of student fluency with Thinking Maps and student learning- content, language, concepts and developing cognition**:** Teachers use Thinking Maps to assess ELLs' progress in their use of Thinking Maps for thinking, academic learning, and acquisition of academic language.
4. Academic Language Learning (refers to the language of textbooks and content matter tasks)	(6)	Direct and indirect impact of Thinking Maps on academic language learning among ELLs: Teachers cited evidence of direct academic learning that positively influence academic language learning among ELLs since the implementation of Thinking Maps in their respective schools.
5. Engagement (refers to active involvement)	(7)	Teacher Engagement with Thinking Maps *for* cross-curricular purposes (applications)**:** Teachers of ELLs are fully engaged with the Thinking Maps in their respective schools, and express their engagement in various ways.

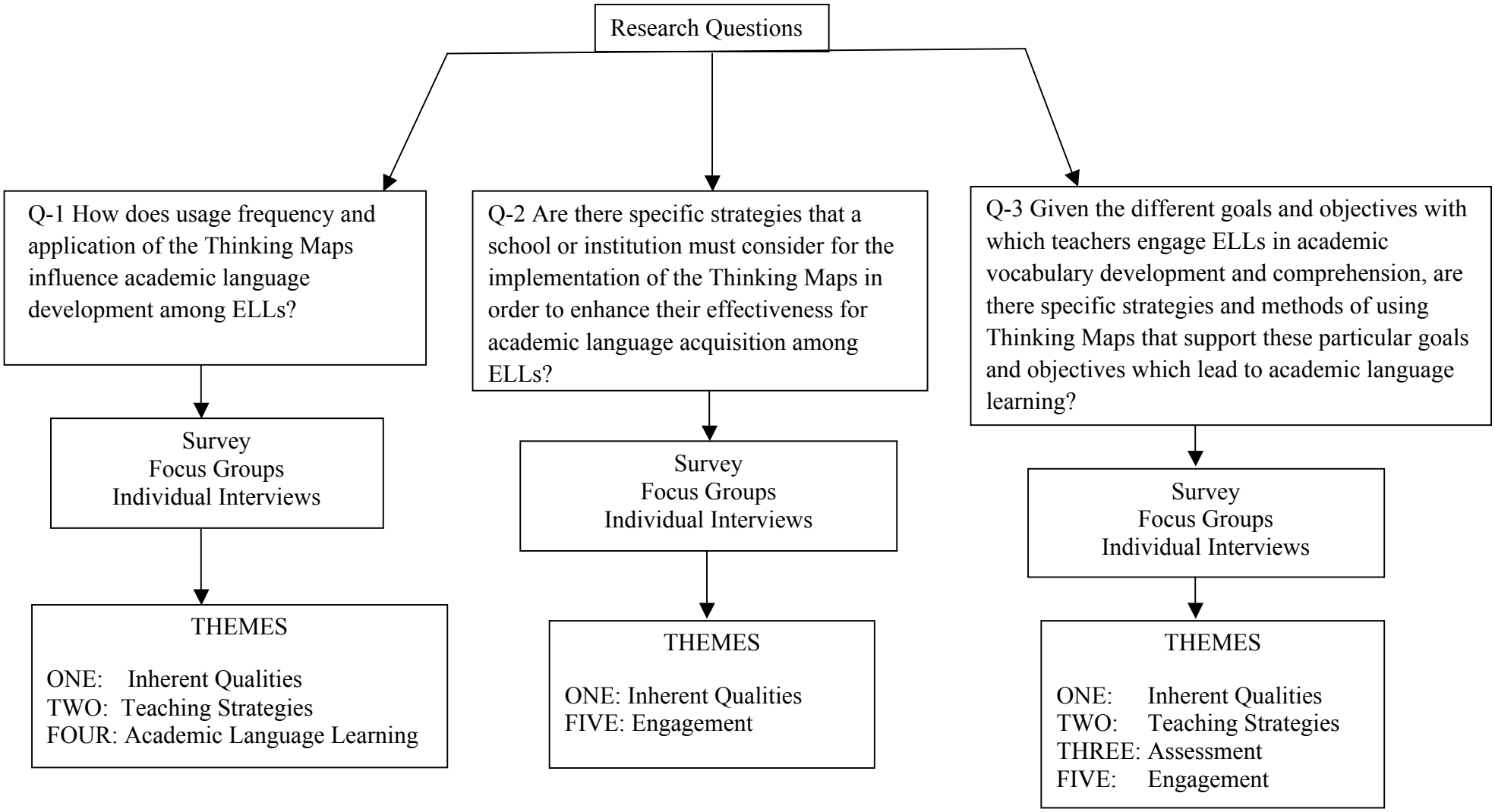


Figure 4.1. Alignment between the Research Questions, Data Sources, and the Themes. This figure illustrates how the research questions, data sources, and themes interconnect.

Extraneous data. It is important to note that responses to a few of the survey questions provide background or contextual information not directly related to any of the three broad research questions; and these responses may shape the interpretation of results. In addition, the rich textual data collected for this study through the focus groups, interviews and survey comments similarly offer some contextual information not directly related to any of the three broad research questions; and that may further influence the interpretation of results. Such codes and themes, however, were very few.

For the benefit of the reader, the following sections are organized by the three research questions beginning with an overall description, followed by survey results and then a descriptive analysis of the rich textual data. The analysis of the data is supported by tables and figures as well as respondents' comments that corroborate the findings.

Research Question One: How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?

To a large extent the survey results establish a context in terms of what usage frequencies and applications teachers used in the target schools. Data from focus group discussions and in-depth individual interviews (see Appendices L and M, respectively) deepened the researcher's examination of this research question. The items from the survey are presented in Table 4.3.

Table 4.3

Survey Items and Corresponding Text Related to Research Question One

Survey Item	Item Text
13	Indicate the map or maps you have introduced to your students. Choose all that apply.
14	Indicate the level of frequency that your students use Thinking Maps.
15	Describe ELLs' responses to the use of the Thinking Maps in general.
16	Describe special education students' response to the use of the Thinking Maps in general.
17	On a scale of 1-5, indicate how well the Thinking Maps have impacted the ELLs' ability to understand academic language.
18	On a scale of 1-5, indicate how well the Thinking Maps have impacted ELLs' ability to use academic vocabulary in their oral and written expression.
19	How often do you use Thinking Maps to assess students' thinking?

Note. This table represents the item number of the survey and its corresponding survey question.

The themes and codes from the focus groups, interviews, and survey comments that relate to usage frequencies and applications are presented in the Appendix as Table A1.

Survey results. The following survey items refer to all Thinking Maps. Thinking Maps consist of eight basic maps: Circle Map, Bubble Map, Double Bubble, Tree Map, Flow Map, Multi-Flow Map, Bridge Map, Brace Map, and an additional map identified as Frame of Reference. Each map represents a distinct cognitive process.

Survey item 13. In this item respondents reported use of all the Thinking Maps. The five most frequently used maps were as follows:

1. Circle Map designed to define concepts or ideas,
2. Bubble Map designed to describe,
3. Double Bubble Map designed to compare and contrast,
4. Tree Map designed to categorize, and
5. Flow Map designed to demonstrate sequencing.

Each of the maps received more than 12% (or more than n = 39 respondents) of affirmative responses to this multiple response question. The majority of respondents (39 or 81%) indicated that they had introduced four or more of the nine maps in their classrooms.

Survey item 14. Respondents reported a similar versatility of usage of the maps by their students with 86% (n = 47) reporting that their students use at least five of the nine types of maps "Sometimes" or "Often." The results are presented in Table 4.4

Table 4.4

Number of Maps Used Sometimes or Often by Students

Number of Thinking Maps	Number of Responses	Percent of Responses
1	1	2%
2	2	4%
4	3	6%
5	6	13%
6	2	4%
7	8	17%
8	11	23%
9	14	30%
Total	47	100%

Note. This table represents the number of Thinking Maps used.

Together, these items give a general sense that almost all of the Thinking Maps were used at least somewhat frequently. The responses establish a firm basis upon which conclusions can be made about the impact of Thinking Maps on ELLs' academic language learning in the target schools.

Survey items 15 and 16. The majority of respondents (n = 39 or 81%) reported that their ELLs' responses to the Thinking Maps were either good or excellent; yet a sizable minority (n = 6 or 13%) reported that the responses from these students were fair. (Three respondents abstained from this question.)

Of interest to this researcher (though not entirely related to the study) was how students with disabilities (SWD) respond to the maps. In item 16, the majority of the respondents (n=35 or 78%) reported that their SWD responses to the Thinking Maps were fair to excellent. This positive indication would merit its own study to understand the meaning of these results and their implications for teaching SWD with Thinking Maps; however, it is out of the scope of this study.

Survey items 17 and 18. Survey findings appear to support a positive experience teaching ELLs since the implementation of Thinking Maps, specifically regarding academic language comprehension and expression. Of the 45 respondents to item 17, 71% reported that Thinking Maps had made a good or excellent impact on ELLs' academic language comprehension. Of the 46 respondents who answered item 18, 52% reported that the impact of Thinking Maps on ELLs' academic vocabulary in written or oral expression was "Very good" or "Extremely good," while another 41% reported this impact to be "Somewhat good."

While the responses from survey items 17 and 18 are positive, they do not describe how the Thinking Maps affected academic language acquisition among ELLs. The rich textual data that spoke to this research question, however, provided more information on ELLs' improved ability to acquire academic language (see Theme One - Inherent Qualities, below.)

Survey item 19. This item is included under Research Question One for its reference to the frequency of teacher behavior. More than 90% of respondents to this question (n = 44) used Thinking Maps to assess student thinking at least "Sometimes," and most of the 90% reported "Often" (n = 22 or 47%). Only six percent (n = 3) used Thinking Maps to assess student thinking "Rarely" (n = 2) or "Never" (n = 1).

Focus groups, individual interviews, and survey comments results. The researcher identified five themes across all data sources. This section provides direct descriptive analysis with evidence of quotations coded by an alpha-numeric code. All comments extracted from the survey, focus groups and individual interviews are referred to within the context of each of the five themes. Research Question One is also answered with responses leading to Themes One, Two and Four. The results are as follows:

Theme One - Inherent Qualities. Theme One provided deep insight into Research Question One, specifically in terms of how the Thinking Maps affected academic language acquisition among ELLs. In the contexts of their focus groups or individual interviews, the respondents revealed qualities of Thinking Maps as they discussed their use in classrooms with ELLs. These qualities are what convinced teachers to use Thinking Maps to support learning among ELLs. With the exception of two codes, all the codes that relate to Theme One shed light on the ways in which usage

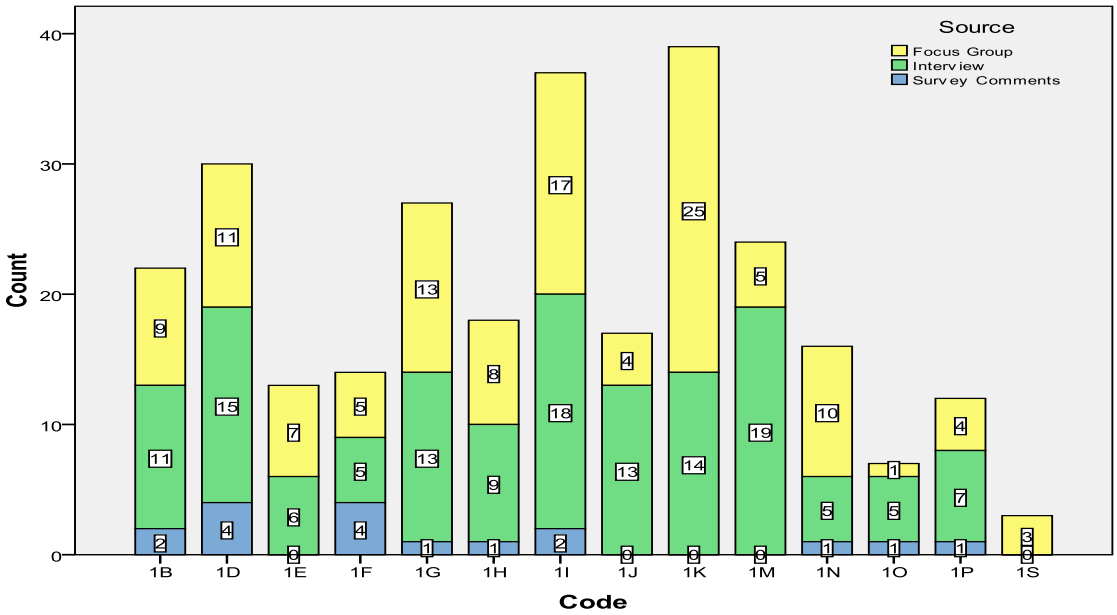
frequency and application of the Thinking Maps influenced academic language development among ELLs. The frequency with which these codes occur in the focus groups, interviews, and survey comments is presented in Figure 4.2.

When all three sources of rich textual data are combined, the highest frequency of codes from Theme One revealed the following qualities of Thinking Maps:

1. synthesis of information or lifelong learning (n = 39)
2. organized and critical thinking or making abstract tasks concrete (n = 37)
3. common language, understanding, or purpose (n = 30)
4. developmental versatility (n = 27).

The following are direct quotes from respondents corroborating these results:

1. "…the nature of the maps and how it's set up gives you that language to give them as lifelong learners…"
2. "…the language triggers also the map"
3. "I think that we were all doing it so that you could have a common language and then, if you're working with 3rd grade the kids who were coming up from 2nd grade you don't have to re-explain it and then the ones you're in 4th grade with they learned it in 3rd grade so it's not new. Everyone in the school they might have been doing different topics or subjects or whatever, it was the same language."



Key:

Code:	Code Description	Code:	Code Description
1B	Academic language is built into Thinking Maps.	1J	Thinking Maps invite focus (as in deepening of understanding, "thinking outside the box.")
1D	Thinking Maps provide access to learning via a common language, understanding, and/or purpose.	1K	Thinking Maps invite acquisition of the skills for synthesis of information and lifelong learning.
1E	Thinking Maps tap into multiple intelligences.	1M	Thinking Maps provide students with opportunities for academic achievement.
1F	Thinking Maps possess transferability in subject matter.	1N	Thinking Maps are engaging for students — they provide "a place to start".
1G	Thinking Maps are developmentally versatile.	1O	Thinking Maps integrate seamlessly into the classroom experience.
1H	Thinking Maps enable students to take ownership of the maps for accomplishing critical thinking, learning and academic tasks.	1P	Thinking Maps are generally versatile and flexible.
1I	Thinking Maps encourage organized and critical thinking — making the abstract concrete.	1S	Thinking Maps match natural thinking (cognitive) patterns.

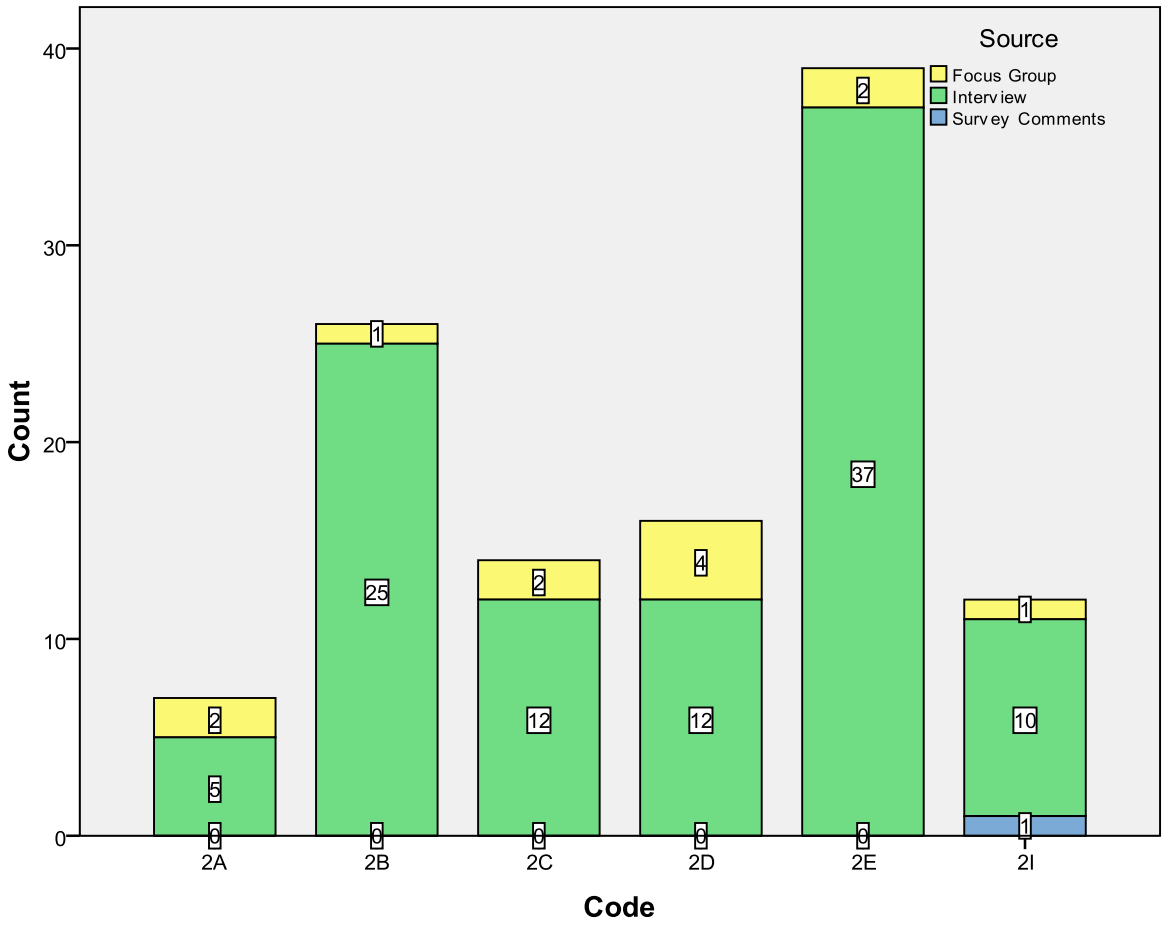
Figure 4.2. Frequency of Codes Relating to Theme One Appearing in Focus Groups, Interviews, and Survey Comments (and Corresponding Key). These are comments regarding the inherent qualities in Thinking Maps.

Theme Two - Teaching Strategies. As the respondents revealed the many qualities that support successful academic language learning for ELLs, they also raised the subject of specific teaching strategies and methods that seem to work especially well when using Thinking Maps with this student population.

This theme and its related codes spoke to actual methods and strategies the respondents identified in survey comments, focus groups, and interviews. As with Theme One, these general classroom strategies — or pedagogical techniques — were raised in the context of working with Thinking Maps.

Teachers often suggested strategies in tandem with statements from Theme One; for instance, a respondent said, "...with my purposeful language [academic language] the students get a chance to…think about the map and…think in terms of what the task requires [strategy]". The results for Theme Two are presented in Figure 4.3.

The data indicates that group work and peer interactions are the most common methods of working with Thinking Maps in the classroom. In light of Theme One - Inherent Qualities, this made sense. Many of the qualities of Thinking Maps — they provide access to learning via a common language, understanding, and/or purpose (code 1D), they are developmentally versatile (code 1G), and they tap into multiple intelligences (code 1E) — support "group work, encourage conversation and peer interactions and team work" (code 2E) which shows the highest frequency by far among codes relating to Theme Two.



Key:

Code	Code Description
2A	Create relevancy or personalize
2B	Be explicit, purposeful
2C	Be repeating
2D	Use modeling
2E	Organize group work, encourage conversation and peer interactions and team work
2I	Focus on the positive, build confidence, encourage ownership and independence

Figure 4.3. Frequency of Codes Relating to Theme Two Appearing in Focus Groups, Interviews, and Survey Comments. These are the comments for Theme Two that emerged from the focus groups, interviews, and survey comments.

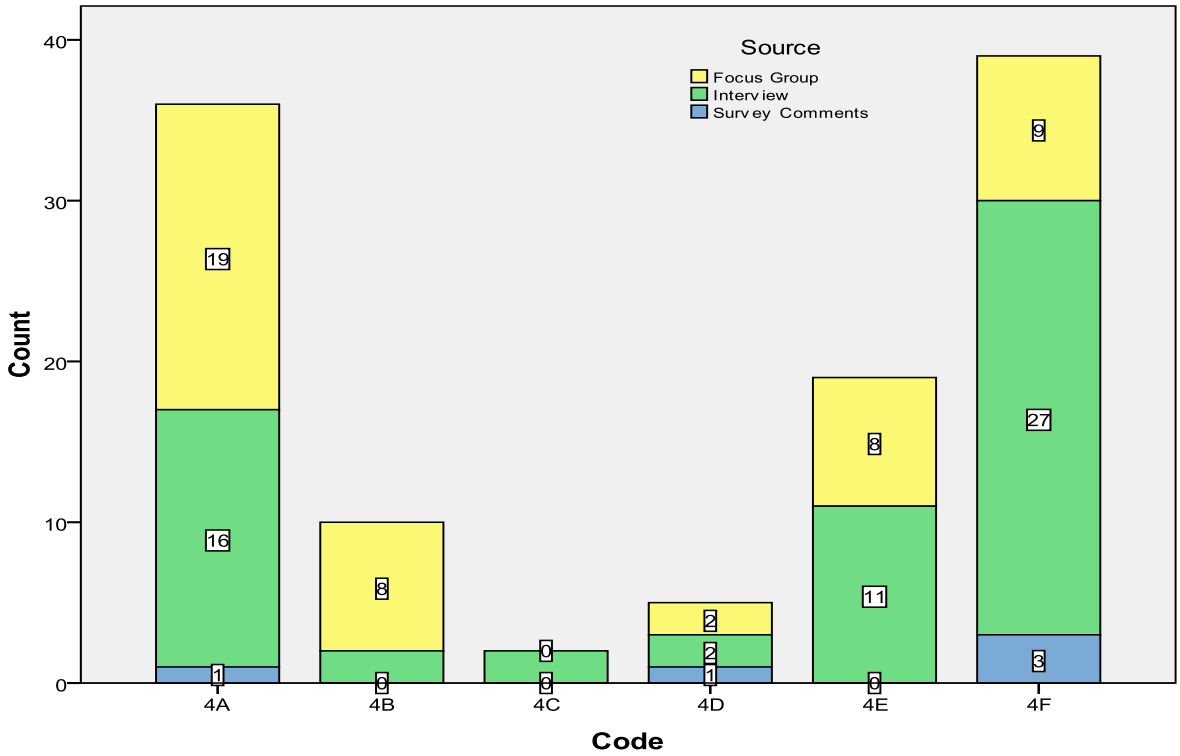
It was apparent that there were substantial discussions among the respondents about common teaching methods observed by the respondents when using Thinking Maps. The teaching methods include:

- Be explicit (code 2B: 26 occurrences),
- Use repetition (code 2C: 14 occurrences), and
- Use modeling (code 2D: 16 occurrences).

Here again the qualities of the Thinking Maps revealed in Theme One — particularly (a) academic language is built into Thinking Maps (code 1B), (b) Thinking Maps possess transferability in subject matter (code 1F), (c) Thinking Maps enable students to take ownership of the maps for accomplishing learning and academic tasks (code 1H), and (d) Thinking Maps integrate seamlessly into the classroom experience (code 1O) — support the substantial frequency of codes 2B, 2C, and 2D under Theme Two - Teaching Strategies. One respondent, for example, explained,

> …already they're creating in their minds their own map because we have the language there and then all of a sudden it all connects and then it connects to the map.

Theme Four - Academic Language. Theme Four synthesized the various types of evidence the respondents provided to prove that they attained their academic goals in their classrooms with ELLs. These measures of success may be attributed to students as well as teachers. The number of codes relating to Theme Four is presented in Figure 4.4.



Key:

Code	Code Description
4A	Increased academic confidence
4B	Increased academic effort
4C	Increased use of multiple sources or use of Thinking Maps as frames of reference
4D	Increased organized thinking
4E	Increased student independence
4F	Acquisition of academic language

Figure 4.4. Frequency of Codes Relating to Theme Four Appearing in Focus Groups, Interviews, and Survey Comments. This table represents the codes relating to Theme Four that appear in focus groups, interviews, and survey comments.

One of Dr. Hyerle's (2004) goals for creating the Thinking Maps was to accelerate academic learning. It is promising, therefore, to observe code 4F: Acquisition of academic language (n = 39) towering above all others in Theme Four.

Hand-in-hand with ELLs' improved ability to acquire academic language was a newfound sense of academic confidence: Not only did the teachers notice students' successes, but so did the students themselves. A respondent explained:

> Our expectations for students have really increased and with our expectations being higher, students work to achieve that because they know that's what we expect and they start to expect that of themselves and having these tools like Thinking Maps allows them to get to that level and really express themselves and I think it does allow them to understand the academic language and vernacular and internalize it and use it in turn. (code 4F)

Another respondent observed:

> I think the other thing [is] that I find particularly exciting is when the kids can pick the map they think is appropriate, and that you can say to them: gee we are like comparing like some two things and … I wonder if we could use a map; and then they say 'a double bubble'…they know it…I think it's been certainly the most motivating tool that we have had." (code 4E)

Once again, the three most frequently occurring codes in Theme Four - Academic Language — Increased academic confidence (code 4A), Increased student independence (code 4E), and the aforementioned Acquisition of academic language (code 4F) — focus attention on the previous two themes. Under Theme One - Inherent Qualities code 1D: Thinking Maps provide access to learning via a common language, understanding, and/or

purpose, as well as code 1E: Thinking Maps tap into multiple intelligences, and code 1M: Thinking Maps provide students with opportunities for achievement, all support Theme Four. Opportunities for achievement built confidence and student independence, according to one respondent who recognized, "Sometimes they will even say 'I did not think about it that way,' then it gives a sense of pride to the student who did something different" (code 1M). Relevant codes in Theme Two - Teaching Strategies include the following: Organize group work, peer interaction, encourage conversation and team work (code 2E) and Focus on the positive, build confidence, encourage ownership and independence (code 2I). Clearly, there is an interrelationship of themes relevant to Research Question One.

Research Question Two: Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?

Insight into this question came largely from focus groups and interview data. The survey also contained two items that spoke to this question directly: item 12, an open-ended response field, "In what specific areas would you like to receive follow-up support in the use of Thinking Maps?" and item 20, a multiple-choice question, "Indicate on a scale of 1-5, five being most preferred and one being least preferred, what professional development options in the use of Thinking Maps would be most helpful to you." Data from focus groups and interviews provided insight on this research question as displayed in Table 4.5.

Table 4.5

Themes for Research Question Two

Theme or survey item	Code	Code Description
1. There are qualities for which Thinking Maps are used by teachers to directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.	1R	A positive cumulative effect arises out of school-wide implementation of Thinking Maps.
5. Teachers of ELLs are fully engaged with the Thinking Maps initiative in their respective schools and express their engagement in various ways.	5A	Teacher learning and growth has occurred or is indicated as a need for additional training.
	5C	Thinking Maps aid in the job of teaching / lesson planning.
	5D	Teachers exhibit enthusiasm or express praise for Thinking Maps.
	5E	Teachers reported planning maps around curriculum.
	5F	Teachers reported planning curriculum around specific maps.
	5G	Teachers expressed thoughts about training and its benefits for teaching and the effect on student learning.

Survey results. The following items describe how teachers developed their skills when using thinking Maps.

Survey item 12. This item invited respondents to type a free-form response in answer to the question, "In what specific areas would you like to receive follow-up support in the use of Thinking Maps"? The researcher created sub-codes especially for responses to this item. They are sub-codes of code 5G which relates to comments about training in Thinking Maps. All of the ideas expressed in item 12 fit into one of the three sub-codes shown in Table 4.6.

Table 4.6

Follow-Up Support

Sub-Code	Description	# of Responses* to item 12
5G1	Connect with colleagues to share ideas, brainstorm, and plan grade-wide or school-wide Thinking Maps initiatives.	8
5G2	Diversify, deepen, or expand usage and applications of Thinking Maps in classroom.	12
5G3	Reconnect with Thinking Map trainer to deepen or reflect on learning.	3

* There were 22 responses to item 12 and one of these was coded under two sub-codes; therefore, a total of 23 comments were sub-coded under code 5G.

These results illustrate how respondents view their professional development opportunities. It appears that casual teacher meetings, where sharing and brainstorming can take place, would be beneficial. Results may also indicate that follow-up training sessions with the Thinking Map trainer would benefit teachers.

Survey item 20. Item 20 was structured to generate a set of responses from all respondents on each of the ranking categories. The ranking categories were as follows:

(a) Individual coaching, (b) Grade level coaching/workshop, (c) Content area teams workshop, (d) Demonstration lessons, and (e) "Other" consisting of content area teams and demonstration opportunities. Figure 4.5 displays the distribution of responses ranked 4 -5. Results appear to indicate that respondents had no strong preference for a specific kind of professional development in the use of Thinking Maps; however, they value having their colleagues with them when they are engaged in it. These responses would be most useful in the hands of a learning and development professional in a school where Thinking Maps have been implemented.

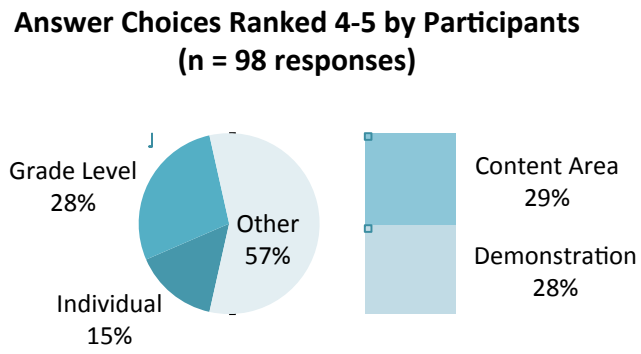


Figure 4.5. Survey Item 20: Answer Choices Ranked 4-5 by Participants (n = 98 responses). This figure describes the various ways respondents increased their knowledge of the use of Thinking Maps.

Focus groups, individual interviews, and survey comments results. There are two specific themes that emerged from combining focus groups, interviews, and survey comments related to Research Question Two: Theme One - Inherent Qualities and Theme Five - Engagement.

Theme One - Inherent Qualities. In this particular examination of the data that helps to explain Research Question Two, Theme One is not to be taken as a whole, but

for its single code 1R: "A positive cumulative effect arises out of school-wide implementation of Thinking Maps." This notion, when stated by respondents, tended to be a powerful reference to the potential academic success of ELLs throughout their K-12 studies and beyond. One focus group member, for example, articulated the idea:

> I've been here a long time and I love the way everyone has embraced this…..now that we and the kids have been exposed to it over time, they're (the students) learning how to think. (Code 1R)

Overall frequency of occurrences for this particular code was 27 as follows: 21 occurring in focus groups, four in interviews, and two in survey comments. It makes sense to the researcher that an idea like this is likely to be raised in a gathering of teachers from a variety of grade levels. As with the survey results under this research question, this single piece of information can be quite useful in the hands of a school administrator who has decision-making power to implement the use of Thinking Maps across a curriculum.

Theme Five - Engagement. Five discrete codes are identified under this theme. Each code implies that respondents regularly use the Thinking Maps when teaching ELLs; and they use Thinking Maps because they have a "commitment" to use them. Theme One - Inherent Qualities threaded throughout many of the conversations in which the current theme was raised, so this researcher infers that the qualities of the Thinking Maps strongly support participants' "commitment."

Code 5A is purposefully broad, because the statements assigned to it were not readily separable into specific concepts. At one end of the spectrum were statements that

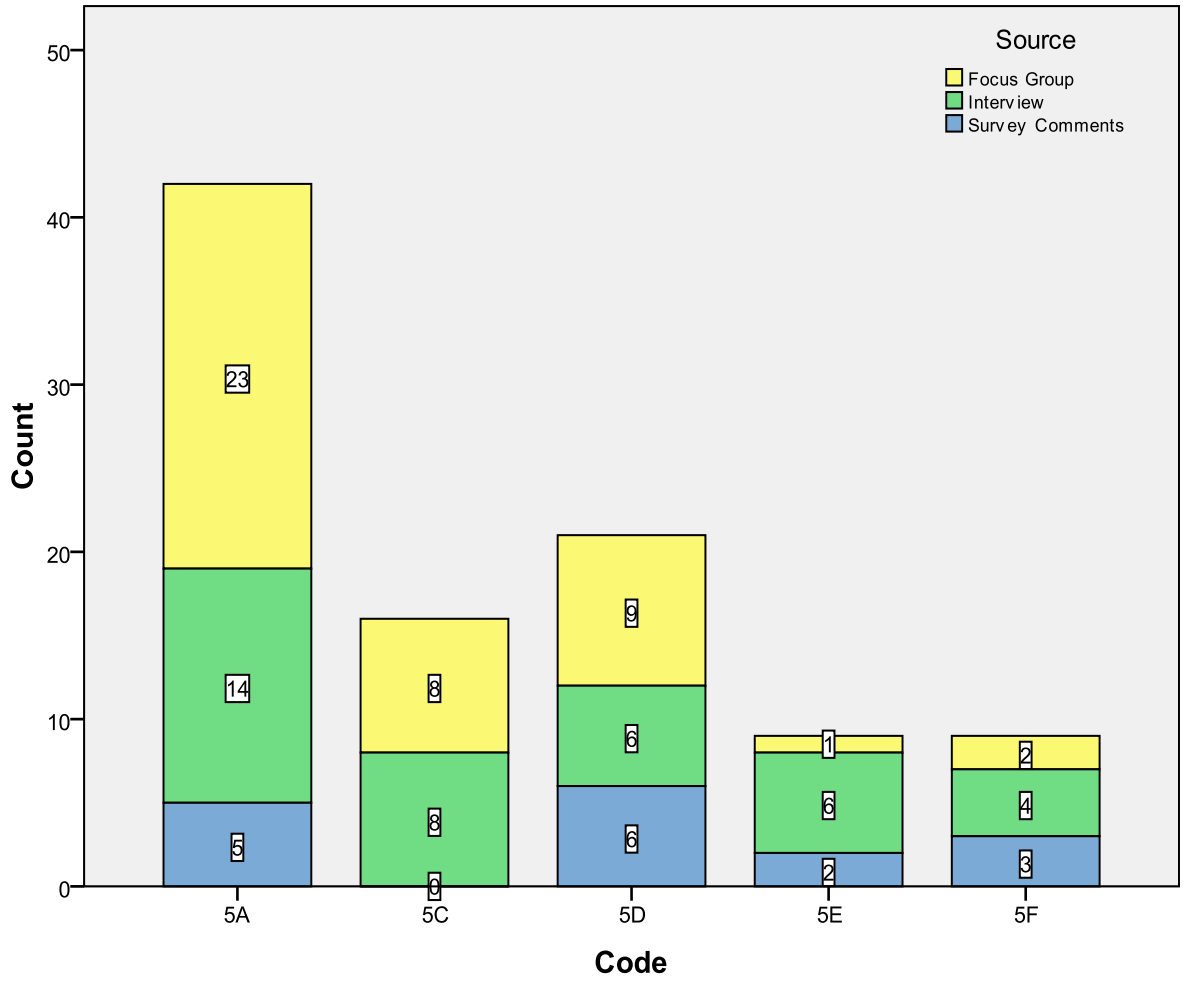
indicated positive changes in a teacher's thinking or successful strategies in the classroom, such as this comment during one of the focus groups:

> We went to training to have teacher leaders in each grade…we have tried to have part of faculty meetings or have our own meeting to come up with some school strategies to keep everyone going. (Code 5A)

At the opposite end of the spectrum were statements that indicated participants' need to think about Thinking Maps. One interviewee complained, "I feel that there's never a chance for like different grade levels to sit around and just talk about it."

The remaining four codes under Theme Five - Engagement are fairly straightforward and self-explanatory. Administrators of any school or other institution considering the implementation of Thinking Maps may benefit from understanding the direct experiences of the participants in this study. A list of the responses to codes 5A through 5F under Theme Five - Engagement are presented in Figure 4.6.

Not surprisingly, the broadest code (5A) was attached to the most responses (n = 42). It appears that the use of Thinking Maps causes or requires a good deal of learning on the part of teachers. This may be the case for all new teaching-strategy initiatives; however, the level of enthusiasm for the Thinking Maps initiative was notable. Code 5D: Teachers exhibit enthusiasm or express praise for Thinking Maps was identified in 21 statements. Respondents certainly experienced their Thinking Map learning curves in a positive way. The substantial amount of references to participants' feeling "supported" by Thinking Maps in their jobs as teachers of ELLs (code 5C) further substantiates this claim.



Key:

Code	Code Description
5A	Teacher learning and growth has occurred or is indicated as a need.
5C	Thinking Maps aid in the job of teaching / lesson planning.
5D	Teachers exhibit enthusiasm or express praise for Thinking Maps.
5E	Teachers reported planning maps around curriculum.
5F	Teachers reported planning curriculum around specific maps.

Figure 4.6. Frequency of Codes Relating to Theme Five Appearing in Focus Groups, Interviews, and Survey Comments.

Participants reported in equal numbers across the various data sources in favor of both incorporating Thinking Maps into curriculum, as well as planning curriculum around specific Thinking Maps. This balanced result speaks to the high level of versatility of Thinking Maps (code 1P) as well as to the high level of engagement these teachers have with planning lessons that include Thinking Maps.

Teachers were enthusiastic (code 5D) about the continual learning they experienced (code 5A) as they used Thinking Maps to plan their curriculum (code 5C). Thinking Maps are flexible and versatile (code 1P); so teachers found ways to incorporate Thinking Maps into specific lessons (code 5E). They also found material to teach using specific Thinking Maps (code 5F), especially when it occurred to them that more familiarity with a particular Thinking Map was warranted for their ELLs.

The remaining code, 5G, is perhaps best explored directly through the quotations and comments from the focus groups and the survey. The text so coded in some way referenced formal teacher training, follow-up support, or professional development in general. The code occurred five times within the focus groups and only once in a survey comment. Since there was a total of six such comments, all are presented in Table 4.7.

Table 4.7

Comments Coded as 5G

Focus Group Quotations
"I love in the training…[because] we were all trained together…a lot of times the grade level leader goes [to training]…so I loved that we all [get] our own materials, we were all introduced to it [Thinking Maps] the same way."
"I think we received really good training…I feel like I was well trained in something so much that I could explain it to somebody else and share it with them."
"In terms of the training…[the trainer] was very explicit and he used his own life and then he had us use our own experiences to do each of the maps, so we had a personal relationship with the maps before we even went to any kind of academic work with the maps. So we felt familiar with them, we felt comfortable with them, we liked them, and then we used them for something else."
"…[Having had Thinking Maps training and the subsequent implementation] is the first time I have felt so supported by my colleagues and system in getting something accomplished…"
[RESEARCHER asked: "…what would be the strategies [for implementing another new educational-strategy program] so that you would be just as effective in the same way as with Thinking Maps?"]
"Training. And everyone getting their own materials, you don't have to share…"
Survey Comment
"I was able to go right back into my classroom and begin to use the maps. I felt I needed minimal preparation after the training."

Research Question Three: Given the different goals and objectives with which teachers engage ELLs in academic vocabulary development and comprehension, are there specific strategies and methods of using Thinking Maps that support these particular goals and objectives which lead to academic language learning?

This research question drew almost exclusively on the textual data in the survey comments, interviews and focus group data. The multiple-choice survey item 19, "How

often do you use Thinking Maps to assess students' thinking?" is included as supporting information for Theme Three as represented in the Appendix as Table B1.

Research Question Three focuses on the strategies and methods of using Thinking Maps to teach ELLs and is of particular interest throughout the study. For this study the relevant goal of using Thinking Maps was for ELLs to more effectively acquire academic language. Study participants made many different statements highlighting such strategies. Some referred to the particular qualities of the Thinking Maps (i.e., Theme One - Inherent Qualities). Others referred to pedagogical strategies and techniques that work particularly well for engaging ELLs in the use of Thinking Maps. Still others shed light on teachers' use of Thinking Maps to assess students' progress as they struggle to acquire or show signs of acquiring new academic knowledge. The manner in which teachers plan the use of Thinking Maps can support the goal of academic language acquisition.

Survey results. The following items describe respondents' perceptions of how students are assessed with Thinking Maps.

Survey item 19. As was noted in answer to Research Question One, more than 90% of respondents to this question (n = 44) used Thinking Maps to assess student thinking at least "Sometimes," and most of the 90% reported "Often" (n = 22 or 47%). Only six percent (n = 3) used Thinking Maps to assess student thinking "Rarely" (n = 2) or "Never" (n = 1). These results support Theme Three, indicating that Thinking Maps assisted in assessing student learning.

Focus groups, individual interviews, and survey comments results. While Theme Three - Assessment is unique to Research Question Three, Themes One, Two,

and Five have some overlap into the other research questions. All of these themes, however, possess applicability to Research Question Three not previously discussed in the contexts of Research Questions One and Two.

Theme One - Inherent Qualities. In contrast to its application under Research Question One, code 1R: "A positive cumulative effect arises out of school-wide implementation of Thinking Maps" is included because it provides an answer to Research Question Three. Students working with Thinking Maps over time from one grade level to the next have shown signs of academic achievements, including acquisition of academic language (code 4F). Statements coded 1R contextualized these improvements as direct results of school-wide implementation of Thinking Maps, as in this comment from a focus group member: "We don't need to teach the third graders, you might need to remind them about the thinking map, but we don't have to teach it explicitly like we did a few years back" (code 1R).

Theme Two - Teaching Strategies. As emphasized for Research Question One, the remaining codes of Theme One - Inherent Qualities listed in the Appendix as Table B1 should be viewed as details of the overriding message that Thinking Maps have a variety of qualities which suggest to teachers specific teaching strategies. Results for Theme One and Two can be viewed in Table B1 and Figure 4.3, respectively.

Overall, with regard to teaching strategies, comments from the survey, focus groups and individual interviews demonstrate that the use of Thinking Maps have a positive effect on the teaching and learning experience when working with ELLs. A small number of comments (identified as code 1T), however, described a few concerns regarding the experience of applying Thinking Maps. Table 4.8 demonstrates comments

that range from how to support the children with unique learning needs to how difficult it is to understand some of the more complex Thinking Maps.

Table 4.8

Responses Coded as 1T: Some Thinking Maps Pose Challenges Because They Seem Difficult for Some Students to Use or Understand.

Code 1T Quotations
"...usually the bridge map seems to be always the one that needs a little bit more work."
"…sometimes I have to say with the double bubble, that drawing does get a little graphic."
"…I like to sit there and try to figure out ways to use as many as I can, and some of them are difficult, especially for the younger children to use…"
"…it's definitely a struggle because even for teachers…it's so much easier to use certain maps for certain subject areas than others…"
"Now it's not usual to come up and use a brace map in a literacy lesson…"
"I think developmentally sometimes…we're pushing them and we're trying and the map is extremely helpful but they may not be just there yet."
"…being in ESL where we only have a limited amount of time, you didn't want to focus your instruction really on how to use the map but on its application to a content…"
"I teach the ABA (applied behavior analysis) class, so sometimes they are not applicable."
"Some maps are easy, others are not."
"Certain maps have been a no-brainer; others have been not so easy…"

Note. These are comments that reflect some challenges when applying Thinking Maps

Theme Three - Assessment. Theme Three relates specifically to teacher assessment of ELLs in the use of Thinking Maps. This can include assessment of

academic learning and proper use of the Thinking Maps. Evidence related to this theme emerged from the focus groups and the interviews as presented in Figure C3. The survey did not yield any data related to this theme.

Since so much of academic learning for ELLs centers on academic language acquisition, it is no surprise that most comments (n = 35) in Theme Three related to verbal expression (code 3B). The researcher identified code 3B a total of 13 times in all the texts. While it may be redundant to have created code 3B, the researcher highlighted it to present teachers' corroboration that Thinking Maps serve as assessment tools and to confirm that respondents were using Thinking Maps for this purpose.

The researcher distinguished between code 3C and code 3B; because code 3C touches on the subject of teacher assessment in a general way. Code 3C shows that respondents raised the issue of their intention to continually assess ELLs' use of the Thinking Maps. It was identified nine times in all of the texts. Code 3D: "Classroom strategy of differentiation enables the teacher to instruct/guide or assess" appeared four times in the texts.

Theme Five - Engagement. Two codes from Theme Five provide insight into Research Question Three: codes 5E and 5F. These codes identified statements in which teachers explained how they plan lessons with Thinking Maps. Code 5E indicates that teachers start with the curriculum and find the Thinking Map(s) that could be used in that particular lesson. One respondent, for example, discovered ways to use the Thinking Maps:

> I do look for ways to use them only because I want to expose it to them (the students) all the maps but then for the most part the curriculum and the objectives kind of dictate what maps to use. (code 5E)

Code 5F indicates that teachers sometimes chose a particular Thinking Map for their class — usually because they want the students to become more familiar with its utility — and then planned lessons based on that choice. This comment exemplified the problem: "The problem you don't want to have is that the students lock themselves into one or two of them (maps)" (code 5F).

Code 5E and code 5F, though opposite approaches to using Thinking Maps in the classroom, occurred exactly the same number of times in all texts combined, each at n = 9. While this may indicate an even distribution of both approaches among teachers, it is impossible to know which approach, if any, may be preferred.

Summary of Results

The researcher's findings support a positive impact of Thinking Maps on the development of academic language and learning among all students, especially ELLs. The data also reveal how the use of Thinking Maps enhances the teaching and learning experience for teachers and students alike, resulting in increased academic language development among ELLs.

Five themes emerged from the data to illuminate what teachers do with Thinking Maps to influence academic language acquisition among ELLs. The five themes are as follows:

1. There are inherent qualities for which Thinking Maps directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.

2. There are teaching strategies that engage ELLs in the use of Thinking Maps to increase their thinking during academic learning, including vocabulary acquisition.

3. Teachers use Thinking Maps to assess ELLs' progress in the use of Thinking Maps for academic learning and academic language acquisition.

4. Teachers cited evidence of academic language learning among ELLs subsequent to the implementation of Thinking Maps in their respective schools.

5. Teachers of ELLs are fully engaged with the Thinking Maps in their respective schools and express their engagement in various ways.

This study's results are significant in light of the literature reviewed in Chapter 3. Given the limitations of small-scale research of this kind, however, the researcher intends to compare and contrast the results of the study with the existing literature in the following chapter. The researcher also presents recommendations for possible avenues of future research as well as recommendations for the implementation of the Thinking Maps in schools to bolster the development of academic language among ELLs.

Chapter 5: Discussion

Introduction

ELLs, of which almost 80% are Hispanic, are not achieving academically by comparison with the White sub-groups (NAEP, 2008). Goldenberg (2008) warns that a viable and sustainable citizenry that contributes to the social and economic health of American society is at risk when he writes, "… these achievement gaps … bode ill for society as a whole, since the costs of large-scale underachievement are very high" (p. 11).

School districts with large populations of ELLs have struggled to educate their students during a time of high academic standards and testing accountability. School systems receiving funds under the federal Race to the Top competitions must implement the new Common Core Standards (CCS) (CCSO, 2009). The CCS demand that students are prepared with unique skills that the workforce of the 21st Century requires. The CCS are designed with the expectation that every student in American schools becomes a self-reliant and active learner, responsive to various tasks and situations. The CCS challenges students to become critical and broad thinkers, inquisitive by nature with good technological skills, if they are to attend college and pursue careers. All of these skills develop through the reading, writing, listening, speaking and numeracy experiences that are available to all students in school. In America, every child is afforded an education regardless of race, creed, economic status — or English language proficiency. It is urgent, then, that ELLs gain skill and knowledge through the explicit and meaningful instruction of academic language in school.

In an attempt to address the gap in academic achievement among ELLs, this study examines the implementation of a cognitive tool in an urban-suburban school district in New York with a significant population of ELLs. Over a period of four years, the school district implemented the use of Thinking Maps for academic instruction in either the English language or the students' native tongue. This bilingual approach is especially valuable because cognitive processes developed independent of the child's proficiency with the English language. Countless conversations with teachers and a plethora of student artifacts clearly demonstrated critical and higher-order thinking, beginning as early as kindergarten using Thinking Maps. Such anecdotal evidence propelled this study forward.

The purpose of the study is to investigate teachers' experiences using Thinking Maps and to catalog the effects of using Thinking Maps on the development of academic language among ELLs. The study's findings support the theory, professional practice, and scholarly understandings in the field of cognitive development and academic language development among ELLs. Results of the study provide compelling answers to the research questions introduced in Chapter 1:

1. How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?

2. Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?

3. Given the different goals and objectives with which teachers engage ELLs in academic vocabulary development and comprehension, are there specific strategies and

methods of using Thinking Maps that support these particular goals and objectives that lead to academic language learning?

Five themes detailed in Chapter 4 emerged to answer these questions: (a) inherent qualities, (b) teaching strategies, (c) assessment, (d) academic language, (e) engagement. The themes comprise the essential features of a conceptual framework for a powerful learning process that can positively affect both teachers and students. The study's answers to the research questions prove that Thinking Maps can serve as a vehicle by which schools can positively affect academic language development among ELLs. By studying how teachers use the Thinking Maps, then, this research does more than substantiate the findings of the literature: Visual tools (e.g., graphic organizers) are among the best practices or strategies to support academic language development among ELLs (Echevarria & Short, 1999; Jiang & Grabe, 2007). The study's results discover a powerful learning process to develop academic language among ELLs that this researcher calls: a *Model for Full Access for High Achievement* (Figure 5.1).

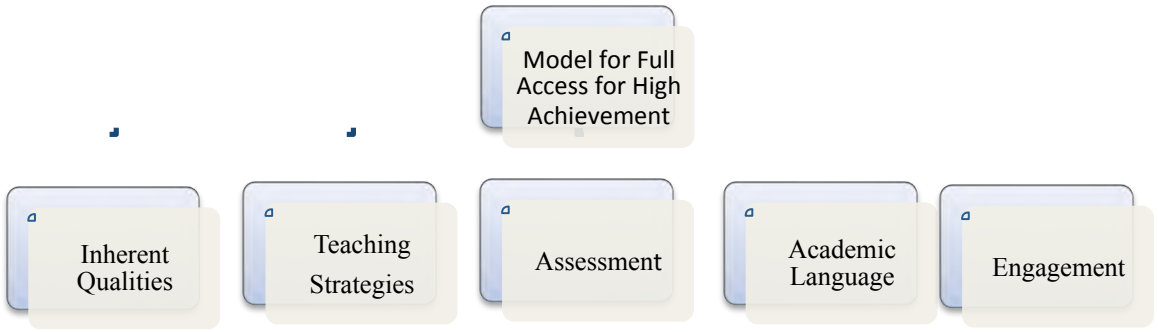


Figure 5.1. A Model for Full Access for High Achievement. This figure represents this researcher's conceptual framework of five essential features of implementing Thinking Maps for the acquisition of academic language among ELLs.

These results are significant because there is still limited research on the effectiveness of visual tools in developing academic language among ELLs (Rice, 1994; Jiang & Grabe, 2007).

Implications of Findings

This study contributes to the existing literature by examining how teachers use visual tools, in particular, Thinking Maps, to improve academic language acquisition among ELLs. Thinking Maps are a consistent set of visual tools designed to match specific cognitive processes. The study supports the purposes of Thinking Maps relative to the academic language development of ELLs. A key ingredient for successful outcomes among ELLs that surfaced in the study is a whole-school training model. Administrators in the schools identified for this study implemented the Thinking Maps over four years, building the capacity of teachers to integrate this cognitive model over time. Respondents in the study substantiate this finding as summarized in the following comment: "…once it became more of a school-wide implementation and they knew the maps, it easily fostered itself into the lesson…"

Unanticipated results include the respondents' explicit desire to continue to learn from each other in order to develop their skills using Thinking Maps. Like any collegial discussion or intellectual exchange, their conversations deepened the complexity and meaningfulness of their comments on how they experienced the Thinking Maps' positive effects on students' academic language and achievement.

The study's results, categorized into five themes, comprise the elements of a *Model for Full Access for High Achievement* (Figure 5.1). This conceptual framework has implications for the existing literature. Specifically, this study adds to current

research by exemplifying the link between teaching practices and the functioning of learners' neurons or the intentional "cognitive learning" connection. Wolfe (2005) focuses on cognitive processes for learning regardless of the student population. The underlying premise of cognitive visual tools is found in neuroscience: the study of how the brain processes information, as well as how it forms, stores, and recalls information. This study finds that the language embedded in Thinking Maps is aligned with how the brain-mind uses and changes information into meaningful and purposeful knowledge. Reflective of this finding is the following comment from respondent interviews:

> The maps give each thought process a name, and a concrete visual to go with it. Something that kids have [that they] can hold onto and can use and refer back to… and as the kids goes through the grades and [become] more comfortable, more and more flexible with their use of the maps. I think that it can only have a positive impact on achievement.

Brain-compatible instruction methods and tools, such as Thinking Maps, can help ELLs to develop an in-depth understanding of academic concepts. The participants in the study often refer to the Thinking Maps as flexible and transferable to the degree that their students (ELLs) are able to use and retain thinking processes that they have learned in school from one grade to the next, and across subject areas.

Piaget's theory of cognitive development is of particular significance to English language teaching and learning. The learner is an individual, actively involved in constructing meaning (Huitt & Hummel, 2003); therefore, teachers must engage each student with work and strategies that are appropriate for that particular student's level of preparation (Willingham, 2009). When learners learn a new language, they are actively

involved in making their own understanding of the language they hear as well as the tasks it describes to them. Cognitive models of instruction describe learning as a process that encourages students to "actively construct" new knowledge (Chamot, 2009; Cummins, 1994; Vygotsky, 1981). The effective teacher provides an environment with tools that assist the learner to leverage cognitive processes so that the learner is focused and stimulated through meaningful tasks (Clark & Mayer, 2002).

Thinking Maps are eight cognitive visual tools (and an additional visual tool called *Frame of Reference* that is integral to each of the eight Thinking Maps). Each Thinking Map addresses a specific and distinct cognitive process. While Thinking Maps may appear to be a form of graphic organizer, unlike GOs they are uniquely designed to match specific cognitive processes (Hyerle, 2009). This distinction is critical because in comparison to GOs, Thinking Maps are consistent in their cognitive purpose and each map specifically relates to a learning objective.

There is little research with regard to the effectiveness of traditional GOs; and studies that have been done reveal inconsistencies and a lack of clarity about visual tools in general. Particularly relevant for this study, Jiang & Grabe (2007) point out a void in the research: Limited training in or exposure to GOs has resulted in little or no impact on learning; and there is a lack of research on the use of GOs to teach ELLs.

Thinking Maps begin to address the shortcomings of GOs as presented by Jiang and Grabe (2007). The purpose of each Thinking Map is specific, clear, and consistent to teach students as well as assess student learning. The continuous and systemic training of teachers and students to use the Thinking Maps strengthens their efficacy in the teaching and learning process. This study not only substantiates the inherent qualities of the

Thinking Maps both as a teaching tool and as an assessment tool, but also corroborates the powerful effect of systematic teacher training to develop teaching strategies that engage students in academic language learning. A whole-school training approach fosters in the participants a commitment to using these visual tools consistently and as part of their daily instructional practice.

A Model for Full Access for High Achievement. This study fills a void in the research to date. The study indicates that teachers' use of visual tools can have a powerful effect on the development of academic language among ELLs. Such an effect is due in part to whole-school implementation of these tools in the curriculum, as well as teacher commitment to using the tools and purposeful focus on the tools for academic English language learning. The themes that emerge from the participants' responses provide a *Model for Full Access for High Achievement* (Figure 5.1). This conceptual framework consists of five essential elements that schools must promote in order to use Thinking Maps and positively affect the development of academic language among ELLs.

This study makes a direct connection to the existing literature as it relates to the interconnectedness among cognition, visual tools, and second language acquisition, as well as teachers' expertise as discussed in Chapters 1 and 2. The Thinking Maps can serve, therefore, as the vehicle by which schools provide a powerful learning process that can positively affect both teachers and students. What follows is this researcher's interpretation of each of the features of a *Model for Full Access for High Achievement*.

Inherent Qualities. This is the only theme that surfaces in all three research questions. Inherent qualities are defined in the study as something existing as a

permanent and inseparable element. These unique aspects of Thinking Maps address the shortcomings of inconsistent purpose and form of visual representation in GOs that resulted in little impact for learning among ELLs as documented by Jiang & Grabe (2007). The literature supports the significance of visual tools such as Mind-Mapping (Buzan, 1979), Concept Mapping (Novak & Gowin, 1984), and Thinking Maps (Hyerle, 2004) for cognitive development within the learning process.

The common language embedded in the Thinking Maps integrates mental associations and analysis of structures apparent in academic content. The language inherent in these cognitive visual tools promotes thinking that propels students to use academic language meaningfully. Hyerle (2004) asserts that the Thinking Maps provide a specific language for learning in the areas of writing and reading comprehension. Language learning is crucial to meet the academic needs of ELLs. ELLs demonstrate gaps predominately in the areas of reading and writing (Cruz, 2004). Each of the respondents' statements below corroborates how Thinking Maps affect reading comprehension:

1. …what happens is if I model my thinking aloud and they see that I'm thinking about it [the] text in that particular way, the map comes out automatically as part of our thinking…the conversation we have and the purposefulness of the words we choose elicit what is to happen with the students.

2. …with the maps…I'm focusing more on the language of [the text], on the language that they need to know…if they don't understand…they're still going to understand what the lesson is about, it is compatible with SIOP objective language, and I think that that's the main thing.

3. …yesterday I said...how will we do setting if you wanted [to] summarize setting [of a story]…with a thinking map, so one student said well, I could do a circle map and just write down all the things that happens in different places and times, so then, somebody else said, 'well you know what? We could do a tree map, and it could say setting and it could say time and place.' So that shows me that they're thinking and they're thinking in that context.

The study's results indicate that the inherent qualities of the Thinking Maps facilitate teachers' abilities to address the academic goals of the curriculum. Several of the qualities described by respondents include academic language that is built into the Thinking Maps, lending each map a consistency of cognitive purpose and goal.

Results of this study also indicate that school-wide implementation positively contributes to the efficacy of the Thinking Maps. Respondents note that students were able to recall and use these visual tools from one school year to the next. All students, and most especially ELLs, engaged with these tools regularly, and over time, with language and content that is complex. For similar results, school administrators should consider common visual tools an integral part of teachers' practice for teaching and learning.

Teaching Strategies. Teaching strategies that incorporate the effective use of Thinking Maps are essential in supporting the development of academic language among ELLs. In response to Research Questions One and Three, participants comment that when teaching with Thinking Maps they approach their instruction with deliberate intention to ensure relevancy and personalization for their students.

Revisiting historical concepts often illuminates current thinking. For example, learning theory (Ausubel, 1963; Ausubel, 2002) emphasizes building connections between ideas, thereby giving significance to construction for knowledge. This historical perspective's endurance in the field of cognition and learning to this day affirms that the construction of knowledge is an essential element of thinking. Ausubel also argues that it is the teaching profession's responsibility to help students to process and construct information in different ways in order to use learning to pursue achievement in all areas of life. This approach to teaching makes learning relevant and personalized for students. Teachers are indeed responsible for adapting educational experiences so that students can achieve in school. This mission is confirmed by comments in this study's focus groups and individual interviews that echo the following:

> …with this blueprint [i.e., Thinking Maps]…you have this kind of framework that you're using to benefit the kids…but I find that I probably gain more benefit in my clarity, or I know when [I'm] being clear to the kids when I have to work through the Thinking Map.

When teachers use tools flexibly during instruction so that students can use information to demonstrate their own thinking processes, then students have begun to personalize learning, as per Ausubel's (1963) enduring concept of personalization. Lev Vygotsky's (1986) perspective for personalization has also endured the test of time. He argues that students build their cognitive abilities in distinctive patterns and that they learn mostly at their own pace. He too urges teachers to serve as a guide to help learners connect new information to existing ideas and challenge what they already know. These

fundamental, historical, and most importantly enduring concepts of learning are at the core of Thinking Maps' value for relevancy and personalization.

In addition to relevancy and personalization, respondents in the study report that purposeful and explicit approaches to teaching with Thinking Maps have a positive impact on academic language development among ELLs. Hall (2002) defines explicit instruction as "a systematic instructional approach that includes a set of delivery and design procedures derived from effective school's research merged with behavior analysis…" (p. 2). How well the use of Thinking Maps supports task-focused group work among students, especially among ELLs, and encourages peer interactions and teamwork, is corroborated by several of the study's respondents. Strategies such as modeling help students to use the Thinking Maps independently and more effectively, as described in the following respondents' comments:

1. …I like and model how to use the Thinking Maps a lot for writing…to give them that reference so that they can recall the words and use them in a meaningful way…I think they know what's expected of them at this point.

2. …within a small group setting it's a lot of thinking. You can hear them say it aloud, thinking it through, and one person will start and you'll hear someone…and you know they're thinking about it but they don't have the language to express it just yet and then someone else chimes in and then the conversation continues…

Respondents also report that using Thinking Maps helped students feel confident, and gave them a sense of ownership and independence. Such positive student outcomes are essential for successful academic achievement among ELLs; because it appears that Thinking Maps may lower a student's Affective Filter (Krashen, 1985). Krashen

identifies key variables that lower a learner's Affective Filter. These variables include motivation, self-confidence, and anxiety. Learners with high motivation, self-confidence, a good self-image, and a low level of anxiety are better equipped for success in second language acquisition. Results of the study affirm these findings:

> Watching my children shine…you had to see them, they were so excited to go up there and share their thinking; and they're stopping people to tell them everything that they know. I mean just…they're confident, they want to go and speak, and they're not shy…

Respondents experience Thinking Maps as vehicles by which students can safely share their thoughts about tasks, texts, or concepts in all subject areas. The study's results attest to numerous accounts of academic conversations in the classroom. Such "accountable talk" (Goldenberg, 1992; Heyman, 1983) includes active participation, the linking of ideas, inquiry, sharing knowledge, and engaging in critical thinking, all attributes of teaching strategies that emerge when using Thinking Maps.

Assessment. Answers to Research Question Two reveal that teachers assessed ELLs in the use of Thinking Maps. Assessment also emerges in answers to Research Question One and Three, because it is a component of teaching strategies. In focus groups and interviews, participants highlight how they can assess their students' academic learning in oral and written form, as well as students' proper use of the Thinking Maps.

A major focus of the study is academic language acquisition among ELLs. The findings demonstrate that the use of Thinking Maps promotes verbal expression among students. Verbal expression is critical if ELLs are to succeed in American schools

(Chard, 2006). As teachers work with ELLs to develop oral language skills, they adjust their own language accordingly. This adjustment allows the teacher to provide comprehensible input (Echevarria, Vogt, & Short, 2008). It appears that the use of Thinking Maps propel students to articulate their thinking regarding a given task. The following comment by a respondent corroborates the literature with regard to verbal expression:

> …years back when I worked in the guided reading group, a lot of times…when I sat with a group I'd have to ask them questions and we'd go back and forth about the questions…and now, what I can do is that…have them write a map, choose a map and then they fill in the map. When they show their thinking on the map and then they show their evidence in the frame, it's not me leading them with questions, it's them picking out the things that are important and I'm not telling them what's important…they can pick that out for themselves because they have a way of representing it…

Marzano and Pickering (2005) argue emphatically for the need to teach ELLs academic vocabulary in a systematic way. Their scholarly work shows significant vocabulary development when teaching ELLs with visual structures that support cognitive patterns. This researcher noticed how the respondents in this study often commented on how Thinking Maps assist with planning oral discourse. It is no wonder that teachers who use Thinking Maps are enthusiastic. They can observe their students, especially their ELLs, gradually improve their oral expression while explaining their thinking. One respondent teacher marvels at such improvement:

> It's just a great way for my ELL student to be able to share, [with] the limited English that she has now, express it in her words with her writing, on her paper, and be able to have it hung up like everybody else as a first step…it's worked very well with her, I have to say.

In addition to assessing their students' academic learning in oral and written form, respondents reveal that they intentionally and continuously assessed ELLs' use of the Thinking Maps. Respondents identified assessment nine times in all of the texts. One method of assessment raised by respondents was differentiation. The study's results demonstrate that differentiation enables the teacher to instruct/guide or assess how students are expressing their learning. The following finding identifies differentiation as an assessment technique available with the use of Thinking Maps:

> I think teaching with the maps has made me slow down a little bit, but in a good way. Because they're still understanding everything, and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have a visual, you have oral development at their own level because we go over it…. and then they can see it so they can connect and then make drawings if need be…so I just think that it's made me more able to differentiate, scaffold the instruction, and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody.

The body of literature on differentiation is clear: frequent assessment of how a student is learning gives teachers deeper insights into students' abilities and learning preferences (Tomlinson, 2005). Differentiation helps students self-assess, peer assess, and practice skills to reach learning goals and objectives. Differentiation is essential to

accommodate various levels of language proficiencies and experiences among ELLs. The teacher creates student-centered learning experiences that provide different approaches to content, process, and final product (drawing, writing, or oral performance). Such experiences also provide continuous, authentic assessment of students' abilities (Tomlinson, 2005). Hyerle (2005) concludes "…because the teachers, working as coaches, gain precious, authentic insights into the interior designs of students' thinking, this enables greater differentiation of teaching and thinking in the classroom" (p.51). The following respondents' comments substantiate Tomlinson's and Hyerle's assertions:

1. Even with guided reading groups it allows the different levels of kids to work together and to come up with a wonderful way to think about whatever the story is that they're reading. Whereas before…you kind of had to stick kids together who could answer the same types of questions and now different kids can work together and all contribute something and feel successful.

2. …from learner to learner…as an English language learner or a native English speaker a whole range of abilities come into play with any academic task and the use of Thinking Maps is not any different from that. …it's a matter of knowing what the kids need and then…differentiating appropriately so that they can get the most out of it…I have some kids in my classroom who need a lot more scaffolding than my ELL students…

Academic Language Learning. Participants indicate in response to Research Question One that they attained their goal in helping ELLs increase academic language acquisition. Respondents observed ELLs' increased academic effort. This finding confirms one of the purposes of Thinking Maps: to accelerate academic learning.

Respondents also note that their ELLs' improved ability to acquire academic language provides a strong sense of academic confidence. They were aware that students were cognizant of their own achievement. One respondent suggests:

> Our expectations for our ELLs ,and all students, have really increased…and with our expectations being higher, students work to achieve that. Because they know that's what we expect and they start to expect that of themselves, and having these tools like Thinking Maps allows them to get to that level and really express themselves; and I think it does allow them to understand the academic language or academic vernacular and internalize it and use it in turn.

This finding is also supported in the CALLA model (Chamot, 2009) where the goal is for students to become independent and self-regulated learners through their sense of confidence, while increasing their skill ability for learning in school. Two participants in the study confirm the powerful effect that self-confidence has on learning as follows:

1. …it gives them ownership. At this point, where we are now, it's been a few years, and you can just give it [Thinking Maps] to them and they can run with it, they don't need any more explanation on how to use the map and then they're just responsible for the information which I think gives them a sense of autonomy and independence…

2. …we let them be teachers…we let them be, we take a step back as an observer and they jump in and they take ownership, which is the biggest thing.

The results of this study clearly show that Thinking Maps provide a common cognitive language that ELLs learn along with non-ELLs. Conversant in this type of common language with their English-speaking school mates, ELLs develop a sense of increased academic confidence and independence, as well as improved acquisition of

academic language. In tandem with teaching strategies, a focus on academic language provides elements of a learning environment that anchors academic achievement; e.g., organized group work, peer interaction, "accountable talk" and team work (Goldenberg, 1992; Heyman, 1983).

Engagement. Responses to Research Question Three indicate that engagement of teachers in the use of Thinking Maps is essential to ensure that all students, especially ELLs, demonstrate academic achievement. Respondents regularly used the Thinking Maps when teaching ELLs prior to and during the study; and they remain committed to using these tools. The following comment reflects the overall perception of respondents who indicated positive changes in their thinking and in the strategies they employed in the classroom:

> …I've been here a long time and I love the way everyone has embraced this…Being in 5th grade now I would say, especially this year, my students can tell me…we could put that in the flow map. Now that they've been exposed to it over time…they're learning how to think (in a deep way)…which is such an unbelievable thing for especially the ELLs going into middle school, where they're going to be having to take notes and to know what to do with language; and now they know when they're reading a passage; and when we're studying for our tests they know what to do with a piece of text and how to organize it and how to think about it, which I think is phenomenal…

A teacher's commitment to using visual tools explicitly during instruction is critical for the successful education of all students, especially ELLs. There is substantial research to support the positive effect on learning of teachers' belief in their ability to

bring about desired student outcomes. Interviewees for the study consistently shared their academic optimism and commitment to teaching strategies that work, in particular, use of the Thinking Maps as reflected in the following comment:

> I have to say that I probably benefit more, I don't know, I find that actually works better for me in my delivery of teaching and even organizing lessons…the kids benefit too, but I find that I'm actually quite reliant…

Certainly school administrators considering implementing Thinking Maps may benefit from understanding the direct experiences of the participants in this study. It appears from the study's results that their investment in training their teachers would not be lost. The vast majority of the study's respondents desire additional follow-up support in order to sharpen their expertise with Thinking Maps. The following summarizes participants' perceptions regarding the importance of "follow-up":

> …we had a phase one training where we had volunteers and then we did a phase two and we came back and revisited the people in phase one. So we had large enough groups where everybody could pick each other's brains by meeting or having follow-up sessions…it's important to develop this critical mass of people where you have a large enough group that it becomes part of the culture. I think that is probably the most important thing that happened with Thinking Maps because there are other initiatives that I've seen come and go that never built a critical mass…

Respondents insist on the importance of whole-school training (or professional development) in the Thinking Maps; because it unifies the school community with a language focused on thinking. Teachers are motivated to improve their use of the

Thinking Maps; because Thinking Maps elicit higher-order thinking from their students. High levels of engagement that turn a school into a community improve academic achievement among all students, not just ELLs.

The literature reveals that visual tools that focus on thinking are essential for the development of academic language among students, especially ELLs. Limited training in or exposure to GOs, however, has hampered these studies and their results show little impact on learning. There is little research on the use of GOs to teach ELLs; there is less research on the use of Thinking Maps to teach ELLs.

The study fills a void in the research, because it focuses on a new generation of cognitive visual tools: Thinking Maps. Thinking Maps' inherent qualities revealed in the study's findings can have a significant effect on the development of academic language among ELLs. Clearly more research is indicated; however, the study's findings support the efforts of teachers and administrators who are struggling to find out "what works" to improve academic achievement among ELLs. Administrators and teachers alike may find a *Model for Full Access for High Achievemen*t useful. The model makes clear for administrators and teachers that without participation in a whole-school training model, the level of engagement and consistent assessment necessary for the implementation of any new teaching strategy cannot be successfully achieved.

Limitations of the Study

This qualitative study uses a phenomenological method to investigate what teachers do with Thinking Maps and what effect the use of Thinking Maps has on academic language acquisition among ELLs. A phenomenological method is appropriate for this study; because "the aim of the researcher is to describe as accurately as possible

the phenomenon (in this case what teachers do with Thinking Maps), refraining from any pre-given framework, but remaining true to the facts" (Groenewald, 2004, p. 5). The researcher uses an inductive process to analyze responses and identify themes based on the categorization of collected narratives. Creswell (2009) corroborates this strategy when he writes, "Data analysis involves collecting open-ended data, based on asking general questions and developing an analysis from the information supplied by participants" (p. 184).

Bentz and Shapiro (1998) remind the researcher that "doing phenomenology" means capturing "rich descriptions of phenomena and their settings" (p. 104). The goal of the method is to explore the truth as it emerges. The researcher coded and categorized these "truths." According to Hycner (1999), "The phenomenon dictates the method (not vice-versa), including even the type of participants" (p. 156). The researcher chose purposeful and convenient sampling. Accordingly, the participant selection was based on the researchers' judgment and the purpose of the research (Babbie, 1995; Greig & Taylor, 1999; Schwandt, 1997).

The conceptual framework of a *Model for Full Access for High Achievement* that evolved from this study is limited to the experience of the respondents. Additional studies of teacher practices and behaviors with Thinking Maps corroborating these results can be significant only if schools provide the essential tools for learning, e.g., the Thinking Maps and whole-school training of all teachers on how to use the tools effectively.

In her previous role as Director, this researcher introduced Thinking Maps to the target schools four years prior to this study; therefore, the participants may have been

likely to focus on their positive experiences. Although the researcher used member checking to establish credibility of the findings, it is possible that the researcher's professional experience influenced the analysis.

As stated in Chapter 3 the selection of a purposeful sample size for the study limits its ability to generalize (Creswell, 2007). Additionally, there are limitations in the study due to the process used for data collection and analysis; and, as in all qualitative research, a subjective element exists where misinterpretations by the researcher or participants limit the study.

The small sample size for the study highlights the participants' positive responses to Thinking Maps as they relate to academic language development among ELLs. The participants were purposefully selected, because they were trained in the use of Thinking Maps and worked with ELLs. To collect data, instruments were created and validated. Their design encouraged participants to describe in detail the effect of Thinking Maps for academic language achievement among ELLs. The data, however, provides important insights into the conscious or unconscious decisions teachers made in using the Thinking Maps, because they were "committed" to these visual tools. These visual tools affected the teachers positively and they found meaning in these tools for their own professional learning. One participant wonders at the breadth of the Thinking Maps' impact:

> I go home and I do the same thing. Because if I have to sit with my teenager and I look at something, I'm immediately in my head going to a map. Then I could organize my information, organize my thoughts, and get it down. When you're thinking about lesson planning too, it really does help you [the teacher] to plan your lessons, to be organized, to deliver a lesson that really carries some weight

with it…so that you can…let's say maybe pack several punches, doing your vocabulary development [and] your comprehension all ties into that.

Recommendations

For future research. A *Model for Full Access for High Achievement* is a conceptual framework for "what works" to improve academic achievement among ELLs. Additional research with a larger sample size and in schools other than at the elementary levels, however, is needed to further develop the conceptual framework into a theoretical framework. Relevant studies could include participants other than teachers, including parents, students, and administrators. Longitudinal studies using quantitative and qualitative methods on how the Thinking Maps impact students with disabilities (SWD) and struggling learners faced with a paucity of language, educational experiences, and the challenges of poverty will prove useful to the field of education.

A longitudinal study tracking ELLs' academic language development and achievement as measured by state and local assessments, based on their consistent use of Thinking Maps, will provide rich data on the academic achievement of second language learners. Another study could focus on isolating the use of Thinking Maps as pure evidence of student achievement, thereby explicitly correlating the effects of Thinking Maps on students' results on local and state assessments. This type of study presents the unique and exciting challenge of isolating specific variables to describe directly the impact of Thinking Maps on student performance. Should Thinking Maps actually be incorporated in state and local assessments, such findings could reveal powerful, direct correlations between the use of Thinking Maps and student achievement.

Whole-school implementation. This researcher recommends to administrators and teachers the implementation of a *Model for Full Access for High Achievement* in all learning communities. Here is a conceptual framework that captures a singleness of focus on a path to success. The model celebrates the whole over the parts. It champions consistency. The fact that all the educators in a learning community use the same effective tool is essential for all students' success. The positive impact of using Thinking Maps as visual tools with deliberate intention for teaching and learning depends upon the collective efforts of school administrators and teachers, as much as it depends upon the efficacy of the tools themselves. A hallmark of student engagement, especially for ELLs, is a compelling learning environment that immerses them in a rigorous, carefully sequenced, and flexible curriculum (Schmoker, 2011). The elements of the model should guide all educators in the judicious selection of tools and resources for teaching ELLs.

To apply a *Model for Full Access for High Achievement*, therefore, administrators and teachers must ask themselves the following questions:

1. What are the *inherent qualities* of tools and resources that will facilitate meaningful learning of complex concepts simply?

2. What tools and resources are most effective to strengthen *teaching strategies* that focus on language and cognition?

3. How will the tools selected by teachers — and administrators — ensure continuous and "informative" *assessment* that will reveal the linguistic and intellectual ability of students?

4. How will tools, resources, and strategies create a level of *engagement* for learning that positively motivates teachers and students, simultaneously?

5. How will the tools, resources, and teaching approaches ensure *academic language learning* so that ELLs can be ready for college and career (Common Core Standards, 2009).

The study's answers to these questions confirm the conditions under which Thinking Maps positively influence the development of academic language among ELLs, an overarching focus of this study. The study clearly shows that all of the teachers (the staff as a whole) at the schools identified for the study were engaged in learning how to use Thinking Maps for the purpose of enhancing cognitive and language skills among ELLs, and consequently among all students.

It is important to emphasize that the schools in the study demonstrated a strong commitment to supporting their teachers' knowledge and expertise in using cognitive visual tools in a deliberate and gradual approach. Over a period of four years, all of the teachers in each of the schools were trained on how to use the Thinking Maps. Indeed, the main condition contributing to the development of academic language of ELLs is whole-school training. The idiomatic expression "slow and steady" captures how these schools improved teachers' expertise in using these cognitive visual tools.

Schools in America today face the challenges of diminishing resources and higher accountability for student achievement; therefore, it makes sense that schools must make clear and deliberate choices in regards to implementing specific instructional strategies that can render optimum learning experiences for students. This researcher strongly advises administrators to introduce the Thinking Maps as a common visual language for thinking and learning across the whole learning community. Schmoker (2011) makes a compelling argument for how schools should consider clarity and cohesiveness in

selecting what is most essential to secure optimum learning. Procedural decisions need to be made if schools are to implement strategies to meet complex academic demands for student learning. Schools with large populations of ELLs in mainstream classrooms, English as a second language classrooms, or bilingual classrooms must be fully dedicated to breaking the cycle of low achievement among ELLs. Teachers and administrators must maintain high expectations for these students; and, therefore, must focus their attention to moving from good to great learning environments. Jim Collins (2001) explains, "The real path to greatness, it turns out, requires simplicity and diligence. It requires clarity, not instant illumination. It demands each of us to focus on what is vital, and to eliminate all of the extraneous distractions" (p.104).

Schools that employ research-based instructional models for ELLs that generally include visual tools as a meaningful strategy for learning can conveniently implement Thinking Maps in programs such as Chamot's (2009) CALLA or Echevarria, Vogt & Short's (2008) SIOP, among many others. ELLs are in every classroom of any given American school. Only a whole-school training model to introduce Thinking Maps will ensure a common cognitive language and approach among all teachers in a school. Thinking Maps blend seamlessly into what teachers need to teach, thus strengthening the goals and objectives of any curriculum.

Students, especially ELLs, need visual tools to assist in mediating academic language in reading and writing tasks. Teachers need to be highly skilled in using the Thinking Maps so that students can reap the full benefit of these cognitive visual tools. The universal brain-based concepts embedded in all learning include defining concepts, comparing and contrasting, describing, establishing cause and effect, sequencing, making

analogies, categorizing, understanding whole to parts and understanding points or frames of reference (Hyerle, 2009). These abilities support learning across all curricular areas regardless of language proficiency and are, therefore, essential for ELLs to develop 21st Century skills.

Conclusion

High failure rates among ELLs have motivated researchers and practitioners to examine and recommend numerous best practices and strategies to stem this tide of low academic achievement. ELLs, especially Hispanics, are not achieving in comparison to the White sub-groups (NAEP, 2008). In her article for *Education Week*, Sarah Sparks (2011) writes "language ability seems to play a role in the achievement gap" (p. 1). New Common Core Standards (CCSO, 2009) call for ELLs to develop English language proficiency as well as academic language proficiency, if they are to be successful in school.

This study focuses on how the use of a cognitive model, the Thinking Maps, affects academic language development among ELLs in two elementary schools in an urban-suburban school district in New York. All of the teachers in these schools received extensive training in the use of Thinking Maps over a period for four years, using a whole-school training approach. The teachers consistently offered positive accounts of their success in engaging with higher-order thinking, teaching and learning, as evidenced by their students' work. The researcher observed this phenomenon over an implementation period of four years and subsequently conducted this study of these teachers' experiences using Thinking Maps to teach ELLs.

The hypothesis of the study is that the use of Thinking Maps can positively impact the development of academic language among ELLs. The study makes an overarching inquiry: Under what conditions do the Thinking Maps positively influence the development of academic language among ELLs?

A review of the literature provides alarming demographic information about ELLs and the difficulties they face in American schools. These students are held to same high academic standards and rigorous assessments as native English speakers; therefore, special attention must be provided to nurture ELLs' ability to understand, use, and express academic language for learning.

The literature reveals several important dimensions that contribute to academic success for ELLs. These include cognition, concept mapping or visual tools, and second language acquisition. Such integrated dimensions are very well articulated in the best practices designed especially for ELLs: Cognitive Academic Language Approach (CALLA) (Chamot & O'Malley, 1994) and Sheltered Instruction Observation Protocol (SIOP) (Echevarria & Short, 1999). Both of these models support the conclusion that cognitively demanding tasks require explicit instruction, modeling, and a focus on thinking when teaching ELLs.

The literature also reveals that GOs used as visual tools that focus on thinking may be essential for the development of academic language and learning among students, especially ELLs. The study cites Jiang and Grabe (2002), Gersten and Baker (2001), and others who have conducted research on the value of GOs for teaching ELLs. Though these studies reveal some strong evidence of their effectiveness, GOs were used

sporadically and with limited academic substance at the target schools or institutions. Gersten and Baker (2001) clearly characterize the problem:

> …even the simple integration of visuals is drastically underutilized, and it seems that, even when used, methods are typically inconsistent or superficial and do not support students' deep processing and thinking. (p. 9)

A new generation of visual tools based on cognitive processes has evolved due to the development of technology and research in neuroscience on how the brain works, especially in relationship to how children engage in learning tasks. This study focuses on teachers using brain-based teaching and learning methods to engage students in classroom conversations and learning experiences that tap into stimulating "student inquiry" (Willingham, 2009; Wolfe, 2005; Cummins, 1994; Chamot, 2009; Short& Echevarria, 2005). The study's findings, in effect, build a bridge between cognitive visual tools and academic language development.

Thinking Maps are part of a new generation of visual tools. The eight cognitive maps have evolved from an extensive and important body of visual tools such as brainstorming tools, graphic organizers, and concept maps. David Hyerle (2011), creator of the Thinking Maps®, writes, "…as human beings, we think creatively and analytically, largely because of our innate capacities for communicating through language…yet all these languages have a foundation of fundamental cognitive structures" (p. 12). This "foundation of fundamental cognitive structures" formed the basis on which participants in this study committed themselves to ensure that their students, particularly their ELLs, would succeed.

The researcher used the phenomenology method to examine three research questions.

1. How does usage frequency and application of the Thinking Maps influence academic language development among ELLs?

2. Are there specific strategies that a school or institution must consider for the implementation of the Thinking Maps in order to enhance their effectiveness for academic language acquisition among ELLs?

3. Given the different goals and objectives with which teachers engage ELLs in academic vocabulary development and comprehension, are there specific strategies and methods of using Thinking Maps that support these particular goals and objectives, which lead to academic language learning?

The term phenomenology is from the Greek, *phainómenon* meaning "that which appears" and *lógos* meaning "study" (Husserl, 1931). A characteristic of phenomenology is extended discussions of intentionality. This method allows the researcher to explore and discover what teachers intend to do with Thinking Maps in order to encourage academic discussions among ELLs. Articulation of the "lived" experiences of the participants is at the heart of a phenomenological study. A survey, along with focus group discussions and in-depth individual interviews captured meaningful and rich data that gave insight into the efficacy of Thinking Maps. Analysis of the data provided answers to the three research questions. The researcher then used an inductive approach to categorize the raw textual data into a conceptual framework*:* a *Model for Full Access for High Achievement*. This model identifies five essential elements that can contribute to the successful use of Thinking Maps to teach ELLs. Here is a framework to facilitate

academic achievement among ELLs for teachers and administrators who are struggling to find out "what works."

Additional research is warranted. In the meantime, the academic achievement of ELLs lies in the balance — more to the point, in the hands of their teachers. If ELLs are to meet the demands of the Common Core Standards (CCSO, 2009), then teachers of ELLs must be highly skilled in developing their students' academic language. Administrators, too, must participate. They must provide teachers with consistent, meaningful opportunities for professional development so that they can expand their expertise in a coherent, focused, and "laser-like" manner. The failure of American schools to speak in the language of the intellect denies all students access to the full range of educational experiences and opportunities available in this rich nation.

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Appendix A

Tables and Figures for Research Question One

Table A1

Focus Group, Interview, and Survey Comments Themes and Codes Related to Research Question One

Themes	Code	Code Description
1. There are qualities for which Thinking Maps are used by teachers to directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.	1B	Academic language is built into Thinking Maps.
	1D	Thinking Maps provide access to learning via a common language, understanding, and/or purpose.
	1E	Thinking Maps tap into multiple intelligences.
	1F	Thinking Maps possess transferability in subject matter.
	1G	Thinking Maps are developmentally versatile.
	1H	Thinking Maps enable students to take ownership of the maps for accomplishing learning and academic tasks.
	1I	Thinking Maps encourage organized thinking — making the abstract concrete.
	1J	Thinking Maps invite focus (as in deeper understanding, “thinking outside the box”.
	1K	Thinking Maps invite acquisition of the skills for synthesis of information and lifelong learning.
	1M	Thinking Maps provide students with opportunities for achievement.
	1N	Thinking Maps are engaging for students - they provide "a place to start".
	1O	Thinking Maps integrate seamlessly into the classroom experience.
	1P	Thinking Maps are generally versatile and flexible.
	1S	Thinking Maps match natural thinking patterns.

Table A1 (cont'd.)

Group, Interview, and Survey Comments Themes and Codes Related to Research Question One

Themes	Code	Code Description
2. The teaching strategies that engage ELLs in the use of Thinking Maps to increase their academic learning, including academic vocabulary acquisition.	2A	Create relevancy or personalize.
	2B	Be explicit.
	2C	Be repeating.
	2D	Use modeling.
	2E	Organize group work, encourage conversation, and team work.
	2I	Focus on the positive, build confidence, encourage ownership and independence.
4. Teachers cited evidence of either direct academic learning or acquisitions that positively impact academic learning among ELLs since Thinking Map implementation in their respective schools.	4A	Increased academic confidence
	4B	Increased academic effort
	4C	Increased use of multiple sources or use of Thinking Maps as frame of reference
	4D	Increased organized thinking
	4E	Increased student independence
	4F	Acquisition of academic language

Note. This Table illustrates the specific key phrases extracted from the narratives of the respondents

Appendix B

Tables and Figures for Research Question Three

Table B1

Themes for Research Question Three

Theme or survey item	Code	Code Description
1. There are qualities for which Thinking Maps are used by teachers to directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.	1B	Academic language is built into Thinking Maps.
	1D	Thinking Maps provide access to learning via a common language, understanding, and/or purpose.
	1E	Thinking Maps tap into multiple intelligences.
	1F	Thinking Maps possess transferability in subject matter.
	1G	Thinking Maps are developmentally versatile.
	1H	Thinking Maps enable students to take ownership of the maps for accomplishing learning, thinking and academic tasks.
	1I	Thinking Maps encourage organized thinking — making the abstract concrete.
	1J	Thinking Maps invite focus (as in deepening of understanding, “thinking outside the box”.
	1K	Thinking Maps invite acquisition of the skills for synthesis of information and lifelong learning (as opposed to temporary test learning).
	1M	Thinking Maps provide students with opportunities for achievement.
	1N	Thinking Maps are engaging for students - they provide "a place to start".

Table B1 (cont'd.)

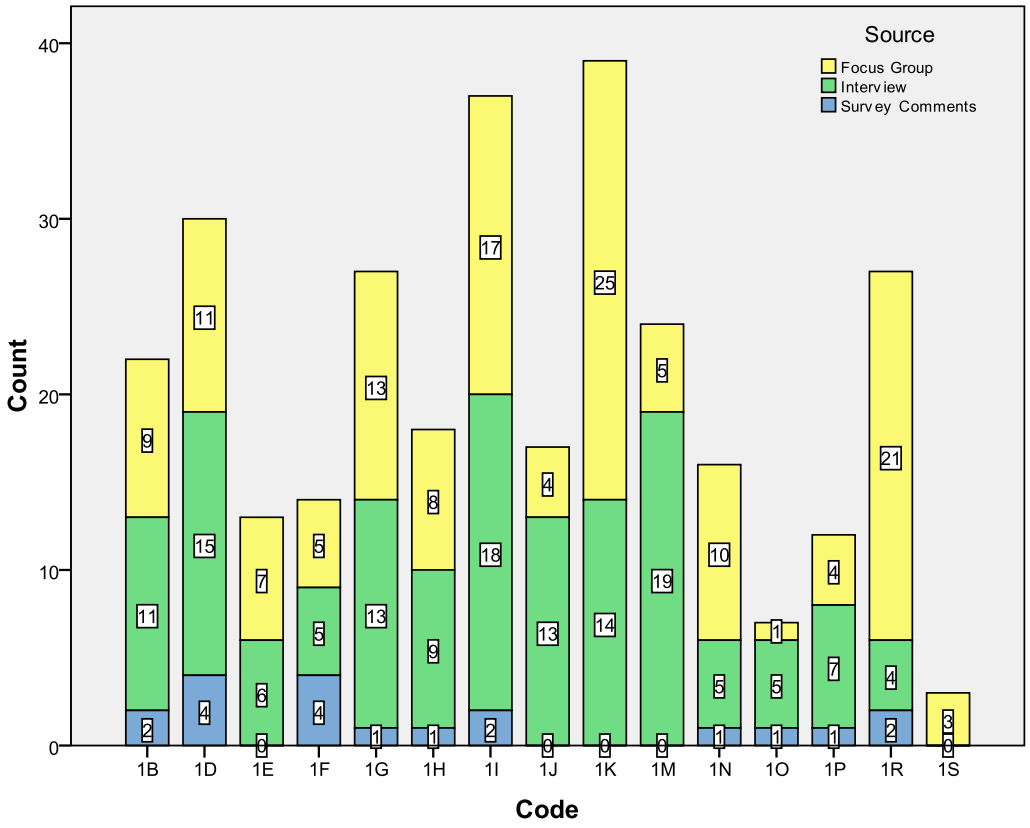
Themes for Research Question Three

Theme or survey item	Code	Code Description
	1O	Thinking Maps integrate seamlessly into the classroom experience.
	1P	Thinking Maps are generally versatile and flexible.
	1R	A positive cumulative effect arises out of school-wide implementation of Thinking Maps.
	1S	Thinking Maps match natural thinking patterns.
2. The teaching strategies that engage ELLs in the use of Thinking Maps to increase their academic learning, including academic vocabulary acquisition.	2A	Create relevancy or personalize.
	2B	Be explicit.
	2C	Be repeating.
	2D	Use modeling
	2E	Organize group work, encourage conversation and team work.
	2I	Focus on the positive, build confidence, encourage ownership and independence
3. Teachers can use Thinking Maps to assess ELLs' progress both of their actual use of Thinking Maps, as well as of their academic learning and acquisition of academic language.	3	The TMs themselves can serve as assessment tools
	3B	Oral or written expression, including "constant accountable talk" and team group contributions
	3C	Meta-cognition--a teacher can see that or what a student understands
	3D	Classroom strategy of differentiation enables the teacher to instruct/guide or assess

Table B1 (cont'd.)

Themes for Research Question Three

Theme or survey item	Code	Code Description
5. Teachers of ELLs are fully engaged with the Thinking Maps initiative in their respective schools and express their engagement in various ways.	5E	Teachers reported planning maps around curriculum
	5F	Teachers reported planning curriculum around specific maps



Key:

Code	Code Description
1B	Academic language is built into Thinking Maps.
1D	Thinking Maps provide access to learning via a common language, understanding, and/or purpose.
1E	Thinking Maps tap into multiple intelligences.
1F	Thinking Maps possess transferability in subject matter.
1G	Thinking Maps are developmentally versatile.
1H	Thinking Maps enable students to take ownership of the maps for accomplishing learning and academic tasks.
1I	Thinking Maps encourage organized thinking — making the abstract concrete.

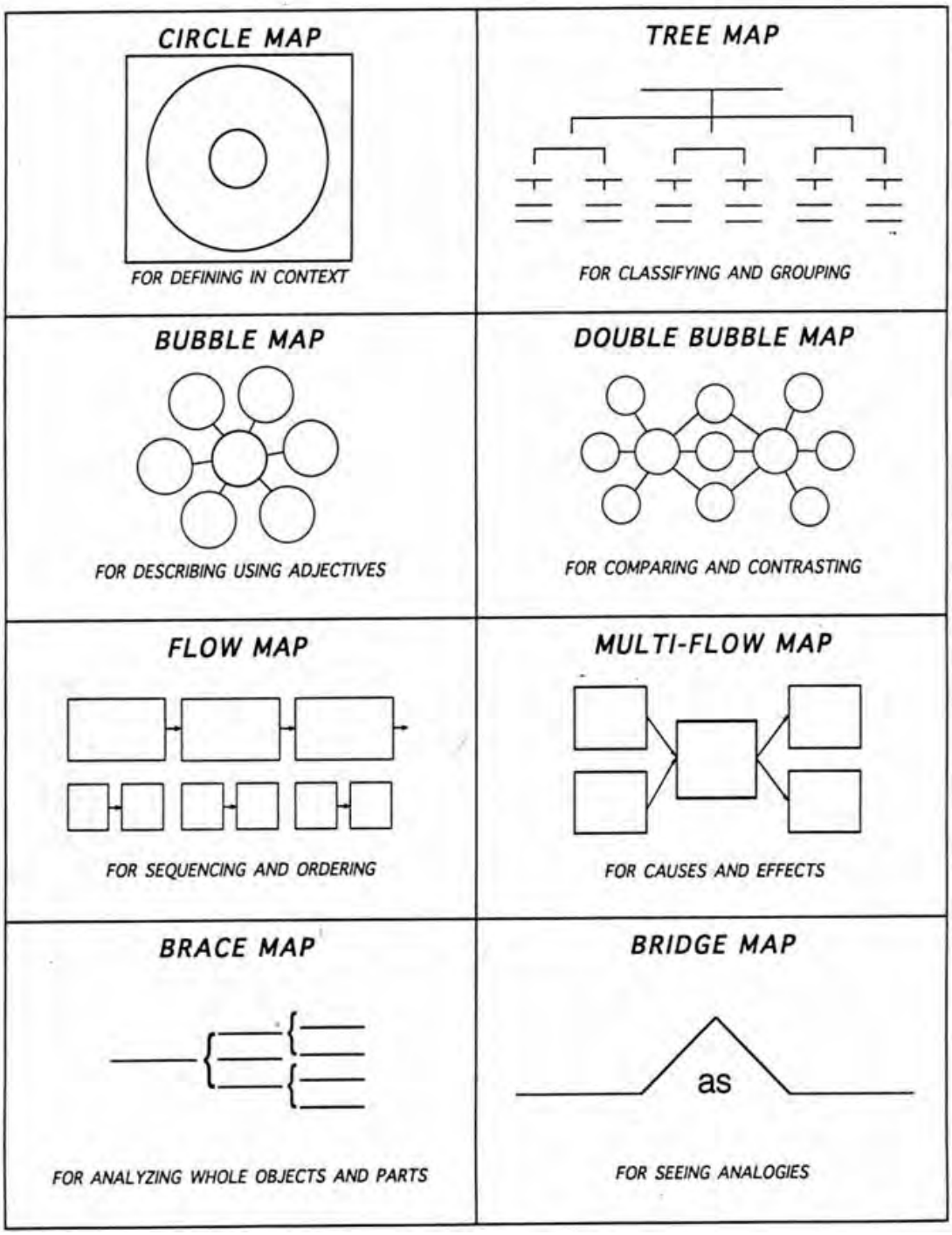
Figure B1 (cont'd.)

Code	Code Description
1J	Thinking Maps invite focus (as in deepening of understanding, "thinking outside the box".
1K	Thinking Maps invite acquisition of the skills for synthesis of information and lifelong learning (as opposed to temporary test learning).
1M	Thinking Maps provide students with opportunities for achievement.
1N	Thinking Maps are engaging for students - they provide "a place to start".
1O	Thinking Maps integrate seamlessly into the classroom experience.
1P	Thinking Maps are generally versatile and flexible.
1R	A positive cumulative effect arises out of school-wide implementation of Thinking Maps.
1S	Thinking Maps match natural thinking patterns.

Figure B1. Frequency of Codes Relating to Theme One Appearing in Focus Groups, Interviews, and Survey Comments

Appendix C

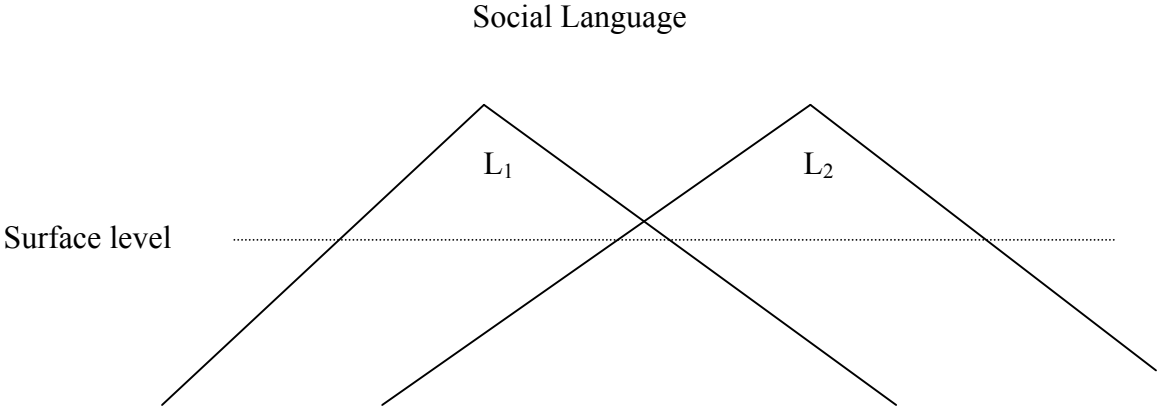
Hyerle, D. (1995). *Thinking Maps: Tools for learning.* Raleigh, NC: Innovative Sciences



Appendix D

Common Underlying Proficiency (CUP)
J. Cummins (1984)

Here is Cummins' common underlying proficiency model on bilingualism represented by the form of two icebergs. The two icebergs are separate above the surface; illustrating two languages that are visibly different in outward conversation. Underneath the surface, the two icebergs connect because the two languages do not function separately. Both languages operate through the same central processing system.



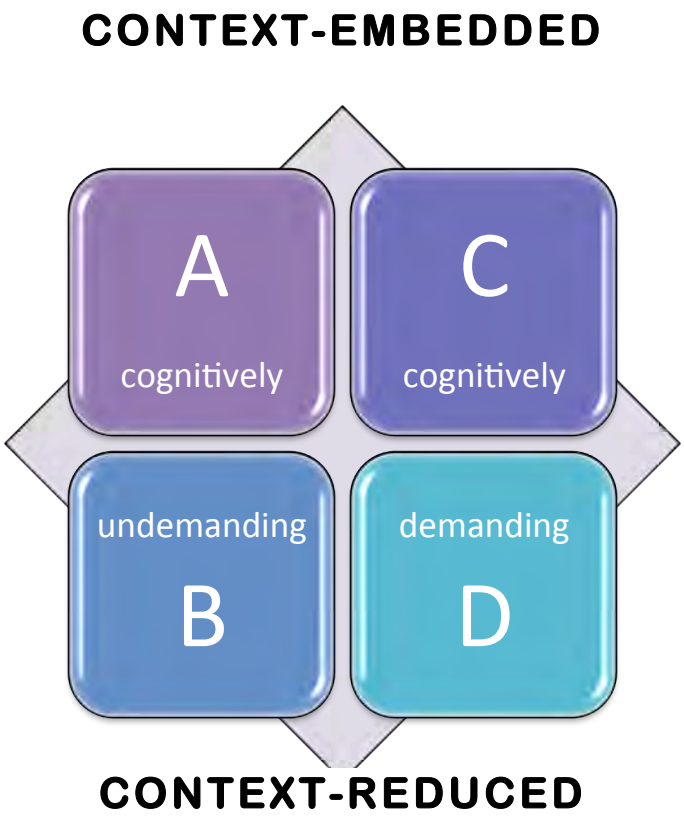
Common **U**nderlying **P**roficiency

(Central Operating System)

Language proficiency alone will not determine when ELLs are prepared to use their second language (L_2) to learn with their grade-level, monolingual English-speaking peers. Previous schooling, academic knowledge, and literacy skills that second language learners have in their first language (L_1) are also strong determiners (Cummins, 1984; Baker, 1993).

Appendix E

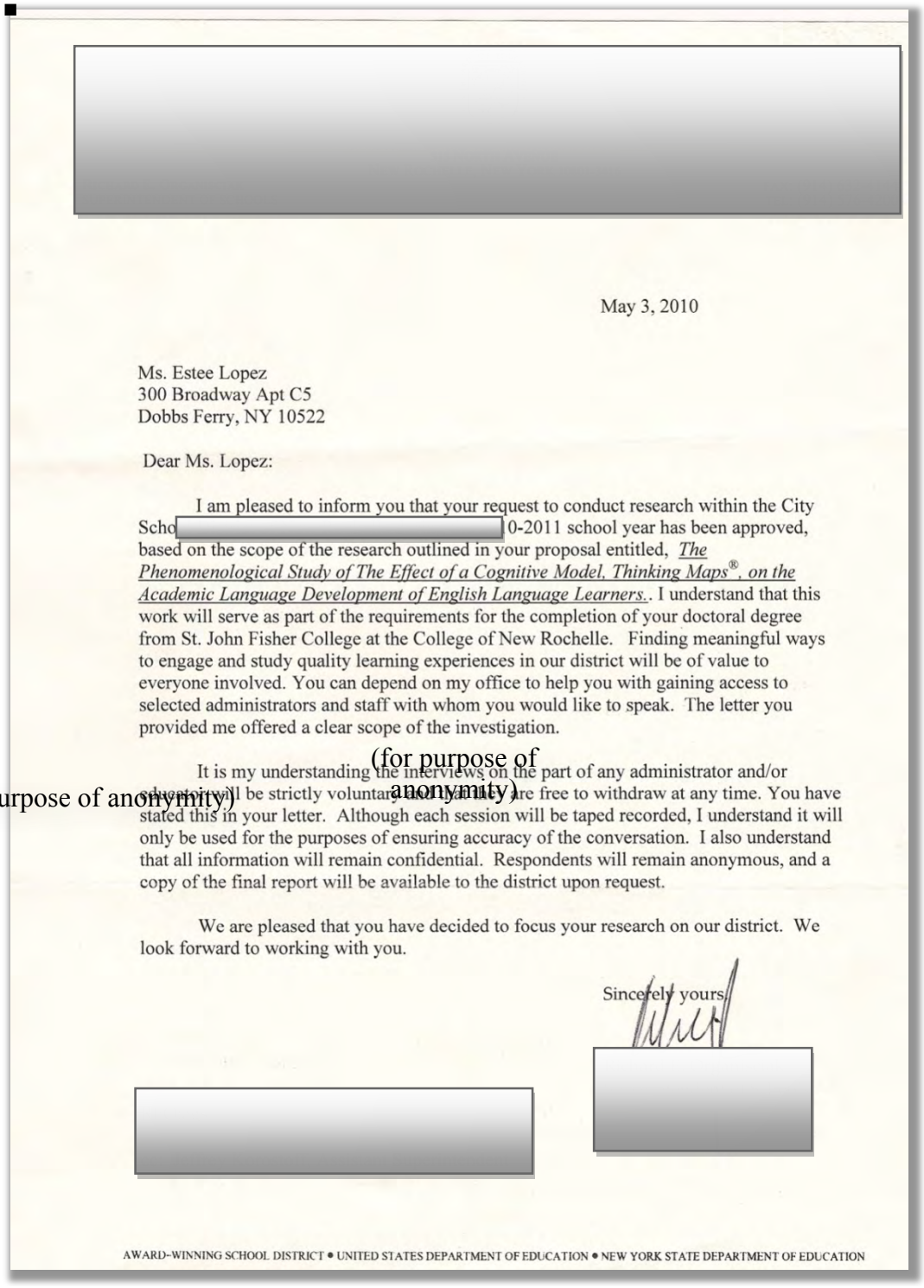
J. Cummins' Quadrants (1984)



Urban Suburban District
(for purpose of anonymity)

Appendix F

Letter granting permission



May 3, 2010

Ms. Estee Lopez
300 Broadway Apt C5
Dobbs Ferry, NY 10522

Dear Ms. Lopez:

I am pleased to inform you that your request to conduct research within the City Scho 0-2011 school year has been approved, based on the scope of the research outlined in your proposal entitled, *The Phenomenological Study of The Effect of a Cognitive Model, Thinking Maps®, on the Academic Language Development of English Language Learners.*. I understand that this work will serve as part of the requirements for the completion of your doctoral degree from St. John Fisher College at the College of New Rochelle. Finding meaningful ways to engage and study quality learning experiences in our district will be of value to everyone involved. You can depend on my office to help you with gaining access to selected administrators and staff with whom you would like to speak. The letter you provided me offered a clear scope of the investigation.

(for purpose of anonymity)

It is my understanding the interviews on the part of any administrator and/or educator will be strictly voluntary and that you are free to withdraw at any time. You have stated this in your letter. Although each session will be taped recorded, I understand it will only be used for the purposes of ensuring accuracy of the conversation. I also understand that all information will remain confidential. Respondents will remain anonymous, and a copy of the final report will be available to the district upon request.

(for purpose of anonymity)

We are pleased that you have decided to focus your research on our district. We look forward to working with you.

Sincerely yours,

AWARD-WINNING SCHOOL DISTRICT • UNITED STATES DEPARTMENT OF EDUCATION • NEW YORK STATE DEPARTMENT OF EDUCATION

Appendix G

Informed Consent Form

St. John Fisher College

INFORMED CONSENT FORM

Title of study:

Name(s) of researcher(s):

Faculty Supervisor: _____ Phone for further information: _____

Purpose of study:

Approval of study: This study has been reviewed and approved by the St. John Fisher College Institutional Review Board (IRB).

Place of study: _____ Length of participation: ____

Risks and benefits: The expected risks and benefits of participation in this study are explained below:

Method for protecting confidentiality/privacy is explained below:

Your rights: As a research participant, you have the right to:

1. Have the purpose of the study, and the expected risks and benefits fully explained to you before you choose to participate.

2. Withdraw from participation at any time without penalty.

3. Refuse to answer a particular question without penalty.

4. Be informed of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to you.

5. Be informed of the results of the study.

I have read the above, received a copy of this form, and I agree to participate in the above-named study.

Print name (Participant) Signature
Date

Print name (Investigator) Signature
Date

If you have any further questions regarding this study, please contact the researcher listed above. If you experience emotional or physical discomfort due to participation in this study, please contact the Office of Academic Affairs at 385-8034 or the Wellness Center at 385-8280 for appropriate referrals.

Appendix H

Interview Questions

1. Describe your experience with the implementation of Thinking Maps.

2. What were the obstacles, if any, in implementing the Thinking Maps in your lessons?

3. What strategies do you use to encourage students to think aloud as they use the Thinking Maps?

4. What evidence do you have that students, in particular ELLs, understand the application of Thinking Maps for their intended use?

5. What evidence do you have that students use thinking as a tool in the development of language acquisition?

6. How does the implementation of Thinking Maps influence the teaching and learning in your classroom?

7. What strategies do you use during the application of Thinking Maps to foster the development of thinking skills of students, particularly, English language learners and/or students with special needs?

8. Describe the language of instruction used when you are implementing the Thinking Maps in your lessons.

9. When using the Thinking Maps, how do they help your students to focus on the academic language embedded in a task?

10. If a student succeeds in a learning task with a Thinking Map, how do you confer with the student about his/her thinking process?

11. How do you use the Thinking Maps with ELLs for assessment of their content learning and their thinking?

12. Do you believe that the uses of Thinking Maps lead, affect, or influence student achievement?

13. Can you describe some or any evidence to this effect? What does it look like? Are there examples that you can share?

Appendix I

Questionnaire

1. SURVEY QUESTIONS

Dear Participants,

As a doctoral student from St. John Fisher College, I want to thank you in advance for agreeing to participate in a Doctoral Study on The Effect of a Cognitive Model, Thinking Maps®, on the Academic Language Development of English Language Learners. Your participation will prove invaluable.

This survey is one of two data sources designed to examine the application, frequency of use and implementation of Thinking Maps.

Using this easy online survey monkey system will take up to 15 minutes or less to complete. All data provided is anonymous and I will be more than happy to share with you the results. The first question requests your consent to participate in the survey.You also have the option to include your name.

However, the last question will ask you if you are willing to be interviewed by me. If so, your name is required so that I can contact you directly and make the necessary arrangements.

Your input in this study is invaluable. I am honored you have choosen to participate. All information will be kept confidential. Thank you again for your valuable input.

Sincerely

Estrella (Estee) Lopez

1. What is your name? (optional)

2. Will you provide your consent to participate in the study by completing this survey?

- ☐ YES
- ☐ NO

3. Please indicate

- ◯ Male
- ◯ Female

4. How many years have you been teaching?

- ◯ 1-3
- ◯ 4-6
- ◯ 7-OR MORE

Other (please specify)

5. What grade levels have you taught?

- ☐ pre-k
- ☐ k-1
- ☐ 2-3
- ☐ 4-5

Doctoral Study Survey Instrument

6. Have you participated in an initial Day 1 Thinking Maps training (a full day session in one day)

◯ Yes ◯ No

7. Have you received the teacher's manual entitled Thinking Maps: A Language for Learning?

◯ Yes ◯ No

8. Indicate the number of days you participated in formal Thinking Maps training. (Formal means conducted by the Thinking Maps Trainer)

◯ 5 or more ◯ 4 ◯ 3 ◯ 2 ◯ 1 ◯ none

9. How many days of training did you recieve from your school based Trainer of Trainers?

◯ 5 or more ◯ 4 ◯ 3 ◯ 2 ◯ 1 ◯ none

10. After your initial training, how many formal follow-up sessions were planned and conducted by the Thinking Maps trainer or the school based trainer?

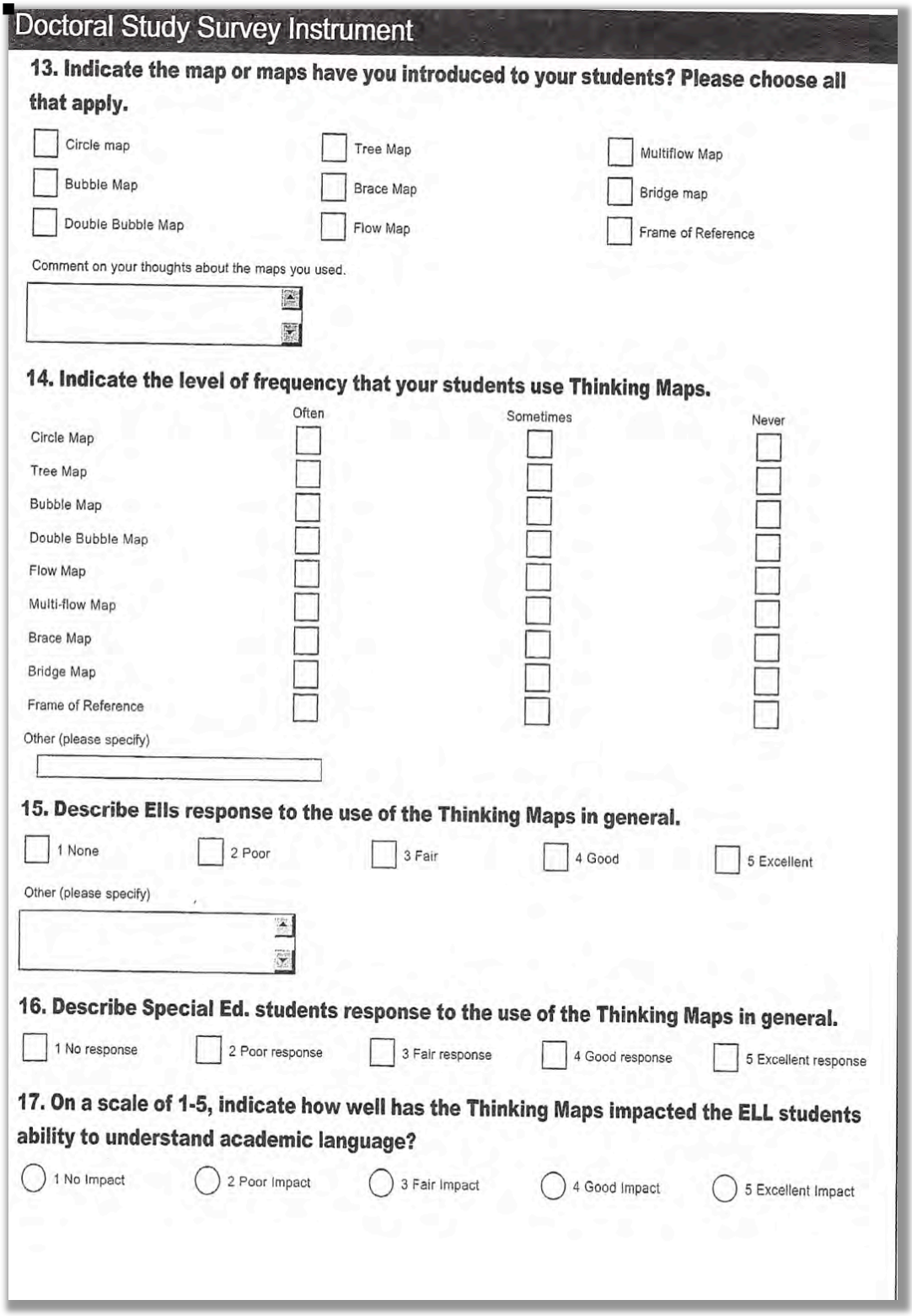
◯ 5 or more ◯ 4 ◯ 3 ◯ 2 ◯ 1 ◯ Not Sure

11. How have you found applying the Thinking Maps in your classroom since your initial training?

☐ Easy ☐ Straight forward ☐ Challenging ☐ Have not used them

Comment on your thoughts regarding this question.

12. In what specific areas would you like to receive follow-up support in the use of Thinking Maps?



Doctoral Study Survey Instrument

13. Indicate the map or maps have you introduced to your students? Please choose all that apply.

- ☐ Circle map
- ☐ Bubble Map
- ☐ Double Bubble Map
- ☐ Tree Map
- ☐ Brace Map
- ☐ Flow Map
- ☐ Multiflow Map
- ☐ Bridge map
- ☐ Frame of Reference

Comment on your thoughts about the maps you used.

14. Indicate the level of frequency that your students use Thinking Maps.

	Often	Sometimes	Never
Circle Map	☐	☐	☐
Tree Map	☐	☐	☐
Bubble Map	☐	☐	☐
Double Bubble Map	☐	☐	☐
Flow Map	☐	☐	☐
Multi-flow Map	☐	☐	☐
Brace Map	☐	☐	☐
Bridge Map	☐	☐	☐
Frame of Reference	☐	☐	☐

Other (please specify)

15. Describe Ells response to the use of the Thinking Maps in general.

☐ 1 None ☐ 2 Poor ☐ 3 Fair ☐ 4 Good ☐ 5 Excellent

Other (please specify)

16. Describe Special Ed. students response to the use of the Thinking Maps in general.

☐ 1 No response ☐ 2 Poor response ☐ 3 Fair response ☐ 4 Good response ☐ 5 Excellent response

17. On a scale of 1-5, indicate how well has the Thinking Maps impacted the ELL students ability to understand academic language?

◯ 1 No Impact ◯ 2 Poor Impact ◯ 3 Fair Impact ◯ 4 Good Impact ◯ 5 Excellent Impact

Doctoral Study Survey Instrument

18. On a scale of 1-5 indicate how well has the Thinking Maps impacted ELL students ability to use academic vocabulary in their oral and written expression.

- ◯ 1 No impact
- ◯ 2 Occasionally well
- ◯ 3 Somewhat well
- ◯ 4 Very well
- ◯ 5 Extremely well

19. How often do you use Thinking Maps to assess students thinking?

- ◯ 1 Never
- ◯ 2 Rarely
- ◯ 3 Sometimes
- ◯ 4 Often
- ◯ 5 All the time

20. Indicate on a scale of 1-5 , FIVE being most prefered and ONE the least prefered, what professional development options, on the use of Thinking Maps, would be most helpful to you?

	1 least	2	3	4	5 most
Individual coaching	☐	☐	☐	☐	☐
Grade level coaching/workshop	☐	☐	☐	☐	☐
Content area teams workshop	☐	☐	☐	☐	☐
Demonstration lessons	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

21. To get a better sense of your experience in the school setting, what type of programs have you taught?

	Mainstream class	Bilingual Class	ESL only	Inclusion class	Other
Select all that apply	☐	☐	☐	☐	☐

Other (please specify)

Doctoral Study Survey Instrument

22. In which of the following ways are you recording student work with the Thinking Maps?

☐ Photographs ☐ Videos ☐ Student original work ☐ Portfolio ☐ Interviews

Other (please specify)

23. Thinking Maps has influenced my teaching practice.

☐ 1-Strongly agree ☐ 2-Agree ☐ 3-Somewhat agree ☐ 4-Disagree ☐ 5-Strongly disagree

Other (please specify)

24. Would you be willing to participate in an interview (at a mutually agreed time) to further explore your perceptions and experience with the use of Thinking Maps with English language learners? Your contribution will provide addtional insights.

◯ Yes ◯ No

◯ If you answered YES, please type your name in the box below so that I can contact you to schedule an interview.

Appendix J

Themes, Codes and Descriptions

Theme	Code	Description
1. There are qualities for which Thinking Maps are used by teachers to directly support the attainment of the goals and objectives that lead to academic learning among ELLs, including academic vocabulary acquisition.	1B	Academic language is built into them
	1D	They provide access to learning via a common language, understanding, and/or purpose
	1E	They tap into multiple intelligences
	1F	They possess transferability in subject matter
	1G	They are developmentally versatile
	1H	They enable students to take ownership of the maps for accomplishing learning and academic tasks
	1I	They encourage organized thinking—making the abstract concrete
	1J	They invite focus (as in deepening of understanding, “thinking outside the box”
	1K	They invite acquisition of the skills for synthesis of information and lifelong learning (as opposed to temporary test learning)
	1M	They provide students with opportunities for achievement
	1N	They are engaging for students - they provide "a place to start"
	1O	They integrate seamlessly into the classroom experience
	1P	They are generally versatile and flexible
	1R	A positive cumulative effect arises out of their schoc implementation
	1S	They match natural thinking patterns
	1T	Some of them have limitations because they are too difficult for some students to use or understand

Theme	Code	Description
2. The teaching strategies that engage ELLs in the use of Thinking Maps to increase their academic learning, including academic vocabulary acquisition.	2A	Create relevancy or personalize
	2B	Be explicit
	2C	Repeating
	2D	Modeling
	2E	Group work, conversation, team work
	2F	Role reversal
	2I	Focus on the positive, build confidence
3. Teachers can use Thinking Maps to assess ELL students' progress both of their actual use of Thinking Maps, as well as of their academic learning and acquisition of academic language.	3	The TMs themselves can serve as assessment tools
	3A	Teachable moments combine spontaneous and simultaneous assessment and guidance--Consolidate with
	3B	Oral or written expression, including "constant accountable talk" and team group contributions
	3C	Meta-cognition--a teacher can see that or what a student understands
	3D	Classroom strategy of differentiation enables the teacher to instruct/guide or assess
4. Teachers cited evidence of either direct academic learning or acquisitions that positively impact academic learning among ELLs since Thinking Map implementation in their respective schools.	4A	Increased Academic Confidence
	4B	Increased Academic Effort
	4C	Increased use of multiple sources or use of TMs as frame of reference
	4D	Increased Organized Thinking
	4E	Increased Student Independence
	4F	Acquisition of Academic Language
5. Teachers identified needs for and benefits of training—initial, ongoing, or both.	5A	Training: thoughts, needs, benefits of

Theme	Code	Description
6. Teachers of ELLs are fully engaged with the Thinking Maps initiative in their respective schools and express their engagement in various ways.	6A	Teacher learning and growth has occurred or is indicated
	6B	Teachers have/had generally positive experiences with them
	6C	They aid in the job of teaching / lesson planning
	6D	Teachers exhibit enthusiasm for them generally or overall
	6E	Teachers reported planning maps around curriculum
	6F	Teachers reported planning curriculum around specific maps

Appendix K

Focus Group Participants' Quotations

Code	Quotations
1B	"There's certain terms and structures of language that come out that trigger these maps …in kids' heads if you've done it long enough and the kids have enough experience." [Jef Lines 271-273]
1B	"…they have heard it in a book, they've seen it in a movie, but then the map actually helps them to then take that word and actually use it within their own conversations and within their own writing." [Jef Lines 522-524]
1B	"And they're very explicit as to what they do…you're doing classifying, you're doing…comparing, you're doing contrast, you're doing cause and effect and so it really streamlines the thinking." [Col Lines 215-221]
1B	"Even for math one of the things that I did that really helped my students because they did a tree map on even and odd and then we've done tree maps on editing and proofreading cause they're different and so my students were like proofreading, what are we looking for and they look at the map and we're doing this, and they know that both of them are used as a way of, and we discussed it, we made a frame and we said...our question was so what's the point of this, why are we learning about editing and proofreading, and they're like oh well it's to make our writing better…" [Col Lines 444-451]
1B	"…even if they don't use the words like compare and contrast, if I say it they automatically look up at the map…because they know up there somewhere is compare and contrast and they'll quickly look through that one..." [Col?]
1B	"Because other people don't look at maps the same way the person who came in today to do a demo lesson did a web and she said to the kids do you know what this is and they all said it's a bubble map…" ["And what was the purpose of the web?"] "The web was to put in the middle someone you appreciate and the reasons why." "…so you put in someone and then you start getting…" "Adjectives." "…really a bunch of adjectives." "…which is the academic language…" "…but the kids are trained with the adjectives so…" "…they went along with her, they didn't give her a hard time, they did what she asked them to do…" "5th grade." "So…they know what a bubble map is but they knew what she was asking too and this poor woman had no idea…" [Col Lines 782-807 (Conversation)]
1B	"…they can make the connection and use the vocabulary that's on the map to form sentences or to make paragraphs. But they have a place to start." [Col Lines 903-905]

Code	Quotations
1B	"…then they have their map to give them their vocabulary." [Col Line 915]
1B	"…before say you wanted to teach compare and contrast…it's…a humongous task in a way, especially for…second language learners, but [with thinking maps] it's…a different process. We have these things and we have a way to teach compare and contrast and it's very user friendly…and very open and very accessible…" [Col Lines 567-571]
1D	"…you could see where you could use the thinking maps in all areas of the curriculum no matter what you were doing, whether it be math, literacy, science, and developing things that…not only was the common language but when Larry did charts that would have posted too because I remember sometimes even thinking within I would refer to the charts and then the definition…what am I teaching, what do I want these children to know, so which is the map to use." [Jef Lines 71-76]
1D	"…then the children learned…the hand signs also…it also gave them that also common language, common definition, but also picture a sensory type of experience." [Jef Lines 79-81]
1D	"I think also for all of us…it's that common language we share, so it scaffolds...just like readers need to…it's all just layers on top of each other…" [Jef Lines 235-238]
1D	"I think that we were all doing it so that you could have a common language and then, you know, this year if you're working with 3rd grade the kids who were coming up from 2nd grade you don't have to re-explain it and then the ones you're in 4th grade with they learned it in 3rd grade so it's not new. Everyone in the school they might have been doing different topics or subjects or whatever, it was the same language." [Col Lines 172-177]
1D	"It has, and that's the thing, I feel like this is the first time that something like this has worked. You know, in the past we've talked about all having the same alphabets so the sounds are the same from class to class and grade to grade and it never—" [Col Lines 692-695]
1D	"…I'm not expecting her to write a full sentence at this time. So she's showing that she can do something that everybody else in the class is."[Jef?]
1D	"…everybody has their particular role…" [Jef Line 457]
1D	"…for the new arrival, there can just be one word and that's acceptable and they're still doing the same thing as everybody else…" [Col Lines 247-256]

Code	Quotations
1D	"I feel like we're giving them…a lifelong learning tool…our ELL's before I think we were just…doing stuff and I'm not sure we were…making much headway." [Col Lines 531-534] "But I feel like now it's very different. It's a way for them to access thinking on the same playing field. That it's made it more level." [Col Lines 536-537]
1D	"…before say you wanted to teach compare and contrast…it's…a humongous task in a way, especially for…second language learners, but [with thinking maps] it's…a different process. We have these things and we have a way to teach compare and contrast and it's very user friendly…and very open and very accessible…" [Col Lines 567-571]
1D	"…I felt that these maps were concrete in ways that allowed every single child in my classroom to express their ideas, get their ideas..." [Col Lines 195-200]
1E	"…then the children learned…the hand signs also…it also gave them that also common language, common definition, but also picture a sensory type of experience." [Jef Lines 79-81]
1E	"…you can ask these little children now, tell me ten compound words and they can do it…all from it's the visual, it's the pictures, it's the actions, it's everything that they're doing, it's all together." [Jef Lines 506-509]
1E	"Not only the words but also the way they're drawn. So for example, the hand gestures, the comparing and contrast, just the arrows, the students get oh this leads to the even and then the event what happens. I'm sorry that was the cause and effect, sorry, but the contrasting one the double bubble, they see the arrows, oh these are separate and this is the same cause both of the arrows are pointing together." [Col Lines 485-490]
1E	"And they're very interested in the hand gestures…" [Col Lines 502-503]
1E	"You know so they're really into the I guess the movement of it also." [Col Line 505]
1E	"Right, kinesthetic, visual." [Col Line 507]
1E	"I find that ELL students especially are much more willing to describe and use language to describe a picture than they are to necessarily come up with it themselves…" [Jef Lines 468-470]

Code	Quotations
1F	"…you could see where you could use the thinking maps in all areas of the curriculum no matter what you were doing, whether it be math, literacy, science, and developing things that…not only was the common language but when Larry did charts that would have posted too because I remember sometimes even thinking within I would refer to the charts and then the definition…what am I teaching, what do I want these children to know, so which is the map to use." [Jef Lines 71-76]
1F	"…to me it's like you have a layering piece to it, you know." [Jef Lines 190-191]
1F	"The other thing that works with ELL students is pictures because it doesn't always have to be the written words, sometimes it can be photographs or diagrams and…when I do math there's a lot of number…" [Jef Lines 462-465]
1F	"…the before part is that we could really frontload a lot of teaching using maps, so we can use the circle map, or use a bubble map or anything to help us frontload so to give like an experience almost to the kids about whatever we're studying so that they can then draw upon it. So it could work in both directions." [Col Lines 211-214]
1F	"…I feel like I only go in for language arts…so it's very rare that we use a brace map, but today we were doing…a main idea and details and then she's like why don't we try to do that in a brace map and it was great because normally you just use it in science or other subjects that I'm not there for, but it was good to use that for language arts and…to…just try out different ones and different subjects." [Col Lines 284-289]
1G	"I think also for all of us…it's that common language we share, so it scaffolds...just like readers need to…it's all just layers on top of each other…" [Jef Lines 235-238]
1G	"…from learner to learner…as an English language learner or a native English speaker a whole range of abilities come into play with any academic task and the use of thinking maps is not any different from that. …it's a matter of knowing what the kids need and then…differentiating appropriately so that they can get the most out of it…I have some kids in my classroom who need a lot more scaffolding than my ELL students…" [Jef Lines 347-354]
1G	"There's no limit either. You know, no one says you have to have five defining pieces on a certain, no one says you have to have three, you know, adjectives in a bubble map. So that one person could have one and be successful, and another person have five and be just as successful." [Jef Lines 568-571]

Code	Quotations
1G	"…maybe another thing that helped us really buy-in...into the whole thinking maps, is dealing with the community and the population of the kids that we work with I felt that these maps were concrete in ways that allowed every single child in my classroom to express their ideas, get their ideas, and really go deeper into their thinking, and not only did it help them it helped me to look through their work." [Col Lines 195-200]
1G	"…and that the maps can be anything…for doing a tree map, for the new arrival, there can just be one word and that's acceptable and they're still doing the same thing as everybody else but you know, maybe an advanced student has a fully filled out tree map with a lot more information but it's accessible to everyone." [Col Lines 247-256]
1G	"…even my B levels are title and...they're doing what they can and they really feel...included regardless of the level of capacity at the moment…" [Col Lines 327-330]
1G	"Even with like guided reading groups it allows the different levels of kids to work together and to come up with a wonderful way to think about whatever the story is that they're reading. Whereas before you kind of had to stick kids together who could answer the same types of questions and now different kids can work together and all contribute something and feel real successful." [Col Lines 331-335]
1G	"…integrating maps together when we learned and I think that's really interesting higher level stuff." [Col Lines 442-443]
1G	"And also the kids almost forced us to expect it of them because at some point in the past we wouldn't have, they're not going to get this, you know, you wouldn't expect them to get it. There's too much text, they won't be able to do it, but now, they have this accessible way to think about the text, they can do it and they show us that they can do it so now I know you can do it so let's go." [Col Lines 582-586]
1G	"It's really…such a great tool for scaffolding." [Col Line 598]
1G	"...the accessibility--you could have the child that can write a whole paragraph under one thing, with a child like that maybe can draw their answers not necessarily write them out. So if a child never feels like I can't do this, I can't answer this, they're like oh I can do it. Yeah, maybe you can do it but I don't think I can, or at a different level…" [Col Lines 611-615]

Code	Quotations
1G	"…it's still very basic [for "some of them"], but they all have something to write so they're not sitting there struggling…you've broken it down so they have a place to start and something to contribute and then for some kids it does take them to a much higher level." [Col Lines 889-893]
1G	"…I felt that these maps were concrete in ways that allowed every single child in my classroom to express their ideas, get their ideas, and really go deeper into their thinking, and not only did it help them it helped me to look through their work." [Col Lines 195-200]
1H	"It's being able to internalize it and then to use it on their own." [Jef Line 285]
1H	"Because they own it." [Jef Line 538]
1H	"It's an ownership thing and in a way it really lends to more of a constructivist approach where you can give them a project and they're applying their research and everything without necessarily having okay, did you answer question 1, 2, 3, and 4, well I did but in this way. So they're really taking their information, the information that they got and putting it in their words, they're owning the information and I think it helps them stay with the information longer." [Col Lines 229-234]
1H	"…it gives them ownership at this point where we are now, it's been a few years, and you can just give it to them and they can run with it, they don't need any more explanation on how to use the map and then they're just responsible for the information which I think gives them a sense of autonomy and independence…" [Col Lines 247-256]
1H	"I think the other thing that I find particularly exciting is when the kids can pick what map they think is appropriate and that you can say to them gee we are like comparing like some two things and like I wonder what kind of, I wonder if we could use a map and then they're like double bubble…they know it…I think it's been certainly the most motivating tool that we have had." [Col Lines 274-281]
1H	"…and then change that into their paragraph…" [Col Line 299]
1H	"Our expectations for students have really increased and with our expectations being higher students work to achieve that because they know that's what we expect and they start to expect that of themselves and having these tools like thinking maps allows them to get to that level and really express themselves and I think it does allow them to understand the academic language and…vernacular and internalize it and use it in turn." [Col Lines 554-559]

Code	Quotations
1H	"It makes it easier, an easier way to review. It's reading response journals, you can just give thinking maps...make it their own." [Col Lines 631-632]
1I	"…the maps are like almost just like the planning page." [Jef Lines 195-196]
1I	"…because the amounts are so visual it does give them a clear framework." [Jef Lines 207-208]
1I	"Here you have it in a very visual, you know, format that the kids can relate to and they can pick out the actual words and then they can construct the language that they want to use to deliver that message." [Jef Lines 228-230]
1I	"…you're saying the visual is there, it gets them moving, it gets them talking and then you go from there to the language piece…but it's clearer…" [Jef Lines 233-235]
1I	"I go home and I do the same thing because if I have to sit with my teenager and I look at something, I'm immediately in my head going to a map because then I could organize my information, organize my thoughts and get it down and when you're thinking about lesson planning too, it really does help you to plan your lessons to be organized, to deliver a lesson that really carries some weight with it so that you can let's say maybe pack several punches, do you vocabulary development, your comprehension all ties into that." [Jef Lines 402-408]
1I	"…to be able to make that so clear and explicit what you are going to do…there are eight ways to think, here they are…" [Jef Lines 410-411]
1I	"One of the benefits of maps is that you're not putting kids on the spot to generate those answers immediately, that you have something to work from…you get a lot more language that way because they've had time to process, they've had time to create, they've had time to develop and generate before you have that conversation, so the language is there on the page and you can have a conversation as opposed to just kind of struggling through while you try to come up with these words." [Jef Lines 490-496]
1I	"…you say…I'm going to give you a topic sentence and now you have to write about it…we're all freaking out over this, and this I just find really…supports…that comfort to give…you tie to a topic. And they seem to be able to add…they seem to connect all that stuff and they build their own schema…they put it all together and the maps truly support that." [Jef Lines 560-567]

Code	Quotations
1I	"…I've been here a long time and I love the way everyone has embraced this…being in 5th grade now I would say especially this year my students can tell me…we could put that in the flow map…So now that they've been exposed to it over time, they're learning how to think which is such an unbelievable thing for…especially the ELL's going into middle school when they're going to be having to take notes and to know what to do with language, and now they know when they're reading a passage and when we're studying for our tests they know what to do with this piece of text and how to organize it and how to think about it, which I think it's phenomenal…" [Col Line 184-193]
1I	"…it also helps our kids like who might be overwhelmed by text or words, break it down into manageable chunks, and also so that's on the after…" [Col Lines 209-210]
1I	"It's an ownership thing and in a way it really lends to more of a constructivist approach where you can give them a project and they're applying their research and everything without necessarily having okay, did you answer question 1, 2, 3, and 4, well I did but in this way. So they're really taking their information, the information that they got and putting it in their words, they're owning the information and I think it helps them stay with the information longer." [Col Lines 229-234]
1I	"It makes it so clear, a brace map with the main idea, the main idea and the details are in the map." [Col Lines 290-291]
1I	"…it makes a world of difference for the kids. It's so clear for them." [Col Line 296]
1I	"They do, they really interact as to what it looks like." [Col Line 497]
1I	"…the objective of thinking maps is really…teaching the kids the process of thinking…it's not really the framework it's the thinking behind it." [Col Lines 840-843]
1I	"…you're teaching them how to write from the maps as well…when they did the planning page on the test they did the tree map...and then they went to the next part…it's a part that has to be taught and it's not that easy for all of them, but they see it as a way to organize their writing." [Col Lines 879-888]
1I	"…it's still very basic [for "some of them"], but they all have something to write so they're not sitting there struggling…you've broken it down so they have a place to start and something to contribute and then for some kids it does take them to a much higher level." [Col Lines 889-893]
1J	"…it also makes the cognitive process a lot clearer." [Jef?]

Code	Quotations
1J	"…maybe another thing that helped us really buy-in, not really buy into the whole thinking maps, is dealing with the community and the population of the kids that we work with I felt that these maps were concrete in ways that allowed every single child in my classroom to express their ideas, get their ideas, and really go deeper into their thinking, and not only did it help them it helped me to look through their work." [Col Lines 195-200]
1J	"…that [enjoyment] makes them want to stay focused on their work and actually accomplish it." [Col Line 224]
1J	"…I felt that these maps were concrete in ways that allowed [them to]…really go deeper into their thinking..." [Col Lines 195-200]
1K	"…when it comes to academic language, when you're building the map there's this layer of just focusing on the vocabulary." [Jef Lines 163-165] "…but then you layer in the connecting words that make those sentences and make those ideas, and it's that kind of layering that allows a kid to build the complexity of the academic vocabulary." [Jef Lines 176-178]
1K	"…the first level of using of the model is teachers using the model and showing you how to model. The second level is the kids using the models to help them think, but the third level is thinking through the model automatically. It's become this internal model and I think that that's what happens when you use the maps over the years and long enough…" [Jef Lines 254-258]
1K	"There's certain terms and structures of language that come out that trigger these maps …in kids' heads if you've done it long enough and the kids have enough experience." [Jef Lines 271-273]
1K	"In their own reading to really be able to understand once they get into those upper grades, your science and your social studies books, and then how to internalize that information and what is this paragraph talking about because you could be reading a five paragraph article and each paragraph is used, is one may be defining, one may be comparing and how to use it to be able then to understand it, to study it, to acquire the vocabulary of it." [Jef Lines 287-292]
1K	"…you can ask these little children now, tell me ten compound words and they can do it…all from it's the visual, it's the pictures, it's the actions, it's everything that they're doing, it's all together." [Jef Lines 506-509]

Code	Quotations
1K	"…you're going to get more language when you have the maps and the kids have the maps…they can access it once they have it on a map. Sometimes they can't always access it three days…or a week later…from something you've said or a movie that they've watched…but when they have it on a map they can access it and they can use it to further their understanding or have a discussion or do a written piece." [Jef Lines 512-519]
1K	"…they have heard it in a book, they've seen it in a movie, but then the map actually helps them to then take that word and actually use it within their own conversations and within their own writing." [Jef Lines 522-524]
1K	"…it's specific to what they've learned…and it gives them a mental picture…" [Jef Lines 535-536]
1K	"…you say…I'm going to give you a topic sentence and now you have to write about it…we're all freaking out over this, and this I just find really…supports…that comfort to give…you tie to a topic. And they seem to be able to add…they seem to connect all that stuff and they build their own schema…they put it all together and the maps truly support that." [Jef Lines 560-567]
1K	"It's an ownership thing and in a way it really lends to more of a constructivist approach where you can give them a project and they're applying their research and everything without necessarily having okay, did you answer question 1, 2, 3, and 4, well I did but in this way. So they're really taking their information, the information that they got and putting it in their words, they're owning the information and I think it helps them stay with the information longer." [Col Lines 229-234]
1K	"They did this, this, and this, but you're not really going deeper, you're going, it's a very surface level. Whereas with thinking maps I feel because it's so specific you have to go deeper and I think they really internalize the information and retain it." [Col Lines 238-241]
1K	"…recently and one of my students who is an IEP student goes…we did it on the bridge map…so it really sticks with them." [Col?]
1K	"It's like it [a thinking map] maps your brain, like…the maps map how your brain thinks, but the maps help your brain get mapped in a way." [Col Lines 470-471]

Code	Quotations
1K	"Sometimes they have trouble figuring that out from the words, now they're only also learning the words to their reading, they're making the figure out what map to use so they've gotten, I mean by 5th grade they've gotten to that point. Which if they carry this through high school and college it's phenomenal. It's helped me…organize my life." [Col?]
1K	"…even if they don't use the words like compare and contrast, if I say it they automatically look up at the map…because they know up there somewhere is compare and contrast and they'll quickly look through that one and even if they don't use the words they know the words, they know what they mean and they know what they mean to do, they know how to…" [Col Lines 521-526] "What the thinking is." [Col Line 527] "What the thinking is in order to explain." [Col Line 528] "…which in essence is more important than them being able to verbalize contrast. They know what it means and they know what to do with their thinking."
1K	"I feel like we're giving them…a lifelong learning tool…our ELL's before I think we were just…doing stuff and I'm not sure we were…making much headway." [Col Lines 531-534] "But I feel like now it's very different. It's a way for them to access thinking on the same playing field. That it's made it more level." [Col Lines 536-537]
1K	"Our expectations for students have really increased and with our expectations being higher students work to achieve that because they know that's what we expect and they start to expect that of themselves and having these tools like thinking maps allows them to get to that level and really express themselves and I think it does allow them to understand the academic language and…vernacular and internalize it and use it in turn." [Col Lines 554-559]
1K	"I was thinking that if you were teaching compare and contrast you would teach it and you would be done and then you probably would never compare and contrast again cause you taught it, and now, like compare and contrast is a way to think, it's not a thing that you're taught and you never do it again, it's how people think. People do that all the time. They look at two products and they compare and contrast and so I think I believe that we're giving them that, that's so empowering because it's not just teaching them that and never and acting like it's a thing to learn and that you never use. By you having the maps and they're using them all the time and they're using them when they need them it makes it part of their life and it changes the whole thing. " [Col Lines 620-629]

Code	Quotations
1K	"I think the maps are like MacDonald's sign…when you see the map it conjures up all this stuff and…past experience with the map…triggers…that's how I think…I see MacDonald's and I think fries and…all your experiences about MacDonald's…I think that's why having the visual and having it be so clear and having it over and over again and everywhere, every grade you go into I think it's been really helpful." [Col Lines 684-691]
1K	"so that it sticks." [Col Line 746]
1K	"…so if the kid knows who to compare and contrast and what does it mean then he will be able, or she'll be able to do that thinking regardless of what shape whoever is telling them to do it gives it to them." [Col Lines 845-847]
1K	"…so when they're asked to do a compare and contrast essay in college they're going to be just doing the double bubble and they're going to say here it is." [Col Lines 857-858]
1K	"I think that's why…the kids were just like, even though you're doing the wrong map we know exactly what you're talking about…So they've gotten to that level and it's…well I don't care if you do circles and triangles, we know exactly what you're trying to get at." [Col Lines 860-865]
1K	"I feel like we're giving them…a lifelong learning tool…our ELL's before I think we were just…doing stuff and I'm not sure we were…making much headway." [Col Lines 531-534] "But I feel like now it's very different. It's a way for them to access thinking on the same playing field. That it's made it more level." [Col Lines 536-537]
1K	"…I've been here a long time and I love the way everyone has embraced this…being in 5th grade now I would say especially this year my students can tell me…we could put that in the flow map…So now that they've been exposed to it over time, they're learning how to think which is such an unbelievable thing for…especially the ELL's going into middle school when they're going to be having to take notes and to know what to do with language, and now they know when they're reading a passage and when we're studying for our tests they know what to do with this piece of text and how to organize it and how to think about it, which I think it's phenomenal…" [Col Line 184-193]
1M	"…it's not a perfect…I don't want to make it seem like well I've taught it and it's perfect…that's the potential of it and those little moments of kind of brilliance." [Jef Lines 282-284]

Code	Quotations
1M	"…the feeling that this little girl gets, 3rd grade, you would think what was she able to accomplish. What's great about it is that I'm not expecting her to write a full sentence at this time. So she's showing that she can do something that everybody else in the class is. The confidence level in her has changed so much from September to now, I mean she wants to participate…" [Jef?]
1M	"Even with like guided reading groups it allows the different levels of kids to work together and to come up with a wonderful way to think about whatever the story is that they're reading. Whereas before you kind of had to stick kids together who could answer the same types of questions and now different kids can work together and all contribute something and feel real successful." [Col Lines 331-335]
1M	"But I think it makes them more successful which is the most important part really." [Col Line 608]
1M	"Some of them do…they understand we could do a cause and effect…it's really just lovely and makes me feel really good to see…2nd graders, such little ones that a lot of times are thought of as so little and they don't have that—what can they do—to just come up with all these ideas and ways of presenting it and feeling so proud of themselves. It's amazing." [Col Lines 651-656]
1N	"One of the benefits of maps is that you're not putting kids on the spot to generate those answers immediately, that you have something to work from…you get a lot more language that way because they've had time to process, they've had time to create, they've had time to develop and generate before you have that conversation, so the language is there on the page and you can have a conversation as opposed to just kind of struggling through while you try to come up with these words." [Jef Lines 490-496]
1N	"…it just allows them just to communicate their ideas in this non-threatening…" [Jef Lines 559-560]
1N	"And the students enjoy doing them." [Col Line 222]
1N	"When you're giving them a textbook to read with questions they don't want to be doing that, but if they're taking it apart and putting it into thinking maps that's something that they enjoy and they feel successful." [Col Lines 226-228]
1N	"…I think they like the fact that they're just familiar with it and they get excited to do it…" [Col Lines 247-256]
1N	"...I think it's been certainly the most motivating tool that we have had." [Col Lines 274-281]

Code	Quotations
1N	"…it's more fun for them to do that it's much more interesting and kind of challenging…" [Col Lines 297-298]
1N	"…[the students] really do remember [the maps in the start of a new school year] and they get excited.." [Col Lines 309-316]
1N	"…they can make the connection and use the vocabulary that's on the map to form sentences or to make paragraphs. But they have a place to start." [Col Lines 903-905]
1N	"I have a little girl who's from Yemen and…she speaks…a language that no one can even assist her with. This is her second year…" [Jef Lines 310-312] "…in our school…I found it slow going, but…I'm looking at the bubble map right now, it's a perfect example for her to be able to write a character's name [or] for her to be able to tell me adjectives and we can do this slowly." [Jef Lines 314-317]
1O	"…the map itself was not the thing but that the map was going to be this entrée to all this other stuff, to all the language development and all the cognitive processing that the kids were going to be exposed to and I think that that made it very attractive to us because it wasn't just going to be a replacement for graphic organizers, even though they looked like it on the surface. That it was clear from the beginning that it was more than just what we saw on the surface but that it was a much deeper thing and that we were going to have a lot of exposure to it." [Col Lines 157-164]
1P	"…with this blueprint [i.e., the TM] ["it's kind of ambiguous" [Jef Lines 367-368]]…you have this kind of framework that…you're using…to benefit the kids, but I find that I probably gain more benefit in my clarity, or you know being clear to the kids when I have to work through the thinking map." [Jef Lines 374-377]
1P	"…it's specific to what they've learned…and it gives them a mental picture…" [Jef Lines 535-536]
1P	"…graphic organizers made you fill this box, fill this box. You're making your own. You decide how many bubbles you want." [Jef Lines 575-576]]
1P	"Because they'll often say that, can I draw it, can I put some pictures, sure you can." [Col Line 616]

Code	Quotations
1R	"…we had a phase one where we had volunteers and then we did a phase two and we came back and revisited the people in phase one. So we had large enough groups where everybody could pick each other's brains…it's important to develop this critical mass of people where you have a large enough group that it becomes part of the culture, and I think that that's probably the most important thing that happened with thinking maps because there are other initiatives that I've seen come and go that never built a critical mass…" [Jef Lines 55-61]
1R	"…it was more doable, teacher friendly, easier to implement because of that group of people that you just got that large enough group to make an impact I guess." [Jef Lines 67-69]
1R	"…and everybody had the same charts and the same definitions. You walk into any room, oh there are the maps." [Jef Lines 77-78]
1R	"Teachers also tend to fall back on the maps that they're most comfortable with. But if we had this in place we would know at least for the first eight weeks every child would be exposed to every map, every teacher would then have an activity built upon every map, and possibly the children would be able to utilize them more sooner rather than later throughout the year." [Jef Lines 105-110]
1R	"I think that the school would really benefit if we knew we all were on the same page with the symbols, with the language. I think that we would be a little further along than we are at this point." [Jef Lines 152-154]
1R	"…the first level of using of the model is teachers using the model and showing you how to model. The second level is the kids using the models to help them think, but the third level is thinking through the model automatically. It's become this internal model and I think that that's what happens when you use the maps over the years and long enough…" [Jef Lines 254-258]
1R	"There's certain terms and structures of language that come out that trigger these maps …in kids' heads if you've done it long enough and the kids have enough experience." [Jef Lines 271-273]
1R	"You're able to deliver a really clear message and as the kids use the maps throughout the grades think about how easy it is for…a 4th grade teacher who's meeting with her kids for the first time, but most of those children were in the school last year and you just have a circle map and put your name in it and off you go and barely any directions are necessary." [Jef Lines 378-382]

Code	Quotations
1R	"…if I were to have to teach all of these maps [to my ESL groups] and if it was not a school initiative it probably wouldn't really apply only because of the lack of time and so much to do." [Jef Lines 428-430] "…now we're going, let's define it, what does it mean…the 1st, 2nd graders they know what it is and it's that modeling of the language…and then it translates into their writing…" [Jef Lines 432-437]
1R	"I think that we were all doing it so that you could have a common language and then...this year if you're working with 3rd grade the kids who were coming up from 2nd grade you don't have to re-explain it and then the ones you're in 4th grade with they learned it in 3rd grade so it's not new. Everyone in the school they might have been doing different topics or subjects or whatever, it was the same language." [Col Lines 172-177]
1R	"…I've been here a long time and I love the way everyone has embraced this…being in 5th grade now I would say especially this year my students can tell me…we could put that in the flow map…So now that they've been exposed to it over time, they're learning how to think which is such an unbelievable thing for…especially the ELL's going into middle school when they're going to be having to take notes and to know what to do with language, and now they know when they're reading a passage and when we're studying for our tests they know what to do with this piece of text and how to organize it and how to think about it, which I think it's phenomenal…" [Col Line 184-193]
1R	"…then of course there's always the question is this really going to do what they're saying it's going to do, and is it going to last, you know, are these kindergartners going to get to 3rd grade and really know what a thinking map is and that fact that it has happened…" [Col Lines 264-267]
1R	"We don't need to teach like the 3rd grader, you might need to remind them about the thinking map, but we don't have to teach it explicitly like we did a few years back." [Col Lines 268-270]
1R	"We barely have to do it actually in 2nd grade. In 2nd grade for sure the first three maps, the circle, the bubble and the double bubble…" [Col Lines 271-272]
1R	"They know." [Col Line 273]

Code	Quotations
1R	"They know them and even the flow map, and then the other four they slowly, they know of them and they've used them, but we really push them and then by 3rd grade they really do have it. I think the other thing that I find particularly exciting is when the kids can pick what map they think is appropriate and that you can say to them gee we are like comparing like some two things and like I wonder what kind of, I wonder if we could use a map and then they're like double bubble…they know it…I think it's been certainly the most motivating tool that we have had." [Col Lines 274-281]
1R	"I think the maps are like MacDonald's sign…when you see the map it conjures up all this stuff and…past experience with the map…triggers…that's how I think…I see MacDonald's and I think fries and…all your experiences about MacDonald's…I think that's why having the visual and having it be so clear and having it over and over again and everywhere, every grade you go into I think it's been really helpful." [Col Lines 684-691]
1R	"…it needs to be like that so that it is a smooth transition from year to year…" [Col Lines 744-745]
1R	"'Cause your teacher wants to get to know you, and the kids all know what to do with the circle map now." [Jef Lines 384-385]
1R	"…if I were to have to teach all of these maps [to my ESL groups] and if it was not a school initiative it probably wouldn't really apply only because of the lack of time and so much to do." [Jef Lines 428-430] "…now we're going, let's define it, what does it mean…the 1st, 2nd graders they know what it is and it's that modeling of the language…and then it translates into their writing…" [Jef Lines 432-437]
1R	"…I've been here a long time and I love the way everyone has embraced this…being in 5th grade now I would say especially this year my students can tell me…we could put that in the flow map…So now that they've been exposed to it over time, they're learning how to think which is such an unbelievable thing for…especially the ELL's going into middle school when they're going to be having to take notes and to know what to do with language, and now they know when they're reading a passage and when we're studying for our tests they know what to do with this piece of text and how to organize it and how to think about it, which I think it's phenomenal…" [Col Line 184-193]
1S	"…for the students the access into the maps is very clear. You can see when they use a map they're really it translates into their thinking." [Jef Lines 82-83]

Code	Quotations
1S	"It's like it [a thinking map] maps your brain, like…the maps map how your brain thinks, but the maps help your brain get mapped in a way." [Col Lines 470-471]
1S	"…it really is what you're thinking about…I have a lot of trouble sometimes expressing what I think, and so the thinking maps help me…express what I'm thinking so it is mapping my thoughts and mapping my brain like you were saying. It really does help a lot." [Col Lines 472-476]
1T	"...and you also get to see…what maps aren't they really sure about, which ones are they still having problems with, and usually the bridge map seems to be always the one that needs a little bit more work." [Col Lines 309-316]
1T	"…sometimes I have to say with the double bubble, that drawing does get a little graphic." [Col Lines 673-674] "I use three colors that's the way I get around it." [Col Line 675] "But they like drawing things." [Col Line 676]
2A	"I used the word summer, I did that twice in a row and you have to come up with the eight thinking maps, take your time and you're working together. So they're now meeting each other if they don't know each other..." [Col Lines 309-316]
2A	"But as far as implementing it the way that we were taught to implement it with the kids...a couple years ago...make it personal...all about themselves and then before you go into the academic like that really helped, even though it took a lot of time, you're seeing the payoff…" [Col Lines 351-354]
2B	"…some people call these things graphic organizers, so they're for different reason. They might look like our maps but they're not our maps." [Col Lines 834-836]
2C	"You just give it to them, so it's constant review because it's something they know, they know how to do it." [Col Lines 634-635]
2C	"…that's why they have to practice those and what goes in, it's like reading a chart, it's like another skill" [Col Lines 838-839]
2D	"I've been giving it to them in September and October so they have that comfort level, and then I'm trying to make the switch into okay now that you've seen how I like the way it looks now let's see how you can do it." [Jef Lines 143-146]

Code	Quotations
2D	"…now we're going to write that on our chart and it was just an activity to get them to know that it's very visual. The information is right here, but you're not just going to copy it over, or just spit it out the way that it's on the page…What's important is you can communicate it back to me or whoever…you're writing it on your paper because you're making this report…" [Jef Lines 219-224]
2D	"…we are modeling our thinking out loud with the maps because we start having that conversation with ourselves…" [Jef Lines 413-414]
2D	"…now we're going, let's define it, what does it mean…the 1st, 2nd graders they know what it is and it's that modeling of the language…and then it translates into their writing…" [Jef Lines 432-437]
2E	"I used the word summer, I did that twice in a row and you have to come up with the eight thinking maps, take your time and you're working together." [Col Lines 309-316]
2E	"I said how do you know how many circles you're going to have." [Col Line 683]
2F	"…sometimes the children come up with things that you wouldn't even think of." [Col Line 306]
3	"…using a map and them implementing a map, we can see right then and there if the students are grasping onto the concept that we're working on." [Jef Lines 83-85]
3	"I used the word summer, I did that twice in a row and you have to come up with the eight thinking maps, take your time and you're working together. So they're now meeting each other if they don't know each other, and you also get to see…what maps aren't they really sure about, which ones are they still having problems with...." [Col Lines 309-316]
3	"…only did it help them it helped me to look through their work." [Col Lines 195-200]
3B	"…after I use a map I take the kids to see if they can take a map, maybe highlight a few words from that map, bring it back to the writing, now communicate it back to me." [Jef Lines 184-187]

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3B	"…now we're going to write that on our chart and it was just an activity to get them to know that it's very visual. The information is right here, but you're not just going to copy it over, or just spit it out the way that it's on the page…What's important is you can communicate it back to me or whoever…you're writing it on your paper because you're making this report…" [Jef Lines 219-224]
3B	"It's just a great way for her to be able to share the limited English that she has now and being able to express it in her words with her writing, on her paper, and be able to have it hung up like everybody else as a first step…it's worked very well with her I have to say." [Jef?]
3C	"I love the maps because they just yield so much language and that you get a bird's eye view into the thinking immediately while using a map." [Jef Lines 85-87]
3C	"I would like to know like what they were thinking." [Col Line 830]
3D	"…from learner to learner…as an English language learner or a native English speaker a whole range of abilities come into play with any academic task and the use of thinking maps is not any different from that. …it's a matter of knowing what the kids need and then…differentiating appropriately so that they can get the most out of it…I have some kids in my classroom who need a lot more scaffolding than my ELL students…" [Jef Lines 347-354]
3D	"I'll give colored pencils to certain children because I know that some children I'm expecting a lot more from and the children who are maybe ELL students they might not be able to contribute as much, so I like to be able to keep track of what they're contributing as if they're doing a teamwork map. So that's been very helpful to me." [Jef Line 444-448]
4A	"…they're looking to grab the rulers and that's not what this is about…it's about what you're expressing, what you're putting into your map, that's what counts, and so that transition year I also think we're spending so much more time trying to show them that it's okay to be able to just have a little oval instead of a perfect circle…" [Jef Lines 136-140]
4A	"I've been giving it to them in September and October so they have that comfort level, and then I'm trying to make the switch into okay now that you've seen how I like the way it looks now let's see how you can do it." [Jef Lines 143-146]

Code	Quotations
4A	"…the feeling that this little girl gets, 3rd grade, you would think what was she able to accomplish. What's great about it is that I'm not expecting her to write a full sentence at this time. So she's showing that she can do something that everybody else in the class is. The confidence level in her has changed so much from September to now, I mean she wants to participate…"[Jef?]
4A	"One of the benefits of maps is that you're not putting kids on the spot to generate those answers immediately, that you have something to work from…you get a lot more language that way because they've had time to process, they've had time to create, they've had time to develop and generate before you have that conversation, so the language is there on the page and you can have a conversation as opposed to just kind of struggling through while you try to come up with these words." [Jef Lines 490-496]
4A	"I've never met a student yet who hasn't felt secure to add something, or contribute something to a map…and I've taught at 3rd, and 4th, and 2nd—so it just seems a very secure place for them to take a risk, to talk to someone, to talk to us, to express themselves, and so they always find something to say." [Jef Lines 549-553]
4A	"…you say…I'm going to give you a topic sentence and now you have to write about it…we're all freaking out over this, and this I just find really…supports…that comfort to give…you tie to a topic. And they seem to be able to add…they seem to connect all that stuff and they build their own schema…they put it all together and the maps truly support that." [Jef Lines 560-567]
4A	"When you're giving them a textbook to read with questions they don't want to be doing that, but if they're taking it apart and putting it into thinking maps that's something that they enjoy and they feel successful." [Col Lines 226-228]
4A	"…even my B levels are title and, you know, they're doing what they can and they really feel like we said before included regardless of the level of capacity at the moment…." [Col Lines 327-330]
4A	"Even with like guided reading groups it allows the different levels of kids to work together and to come up with a wonderful way to think about whatever the story is that they're reading. Whereas before you kind of had to stick kids together who could answer the same types of questions and now different kids can work together and all contribute something and feel real successful." [Col Lines 331-335]

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4A	"…you would think that a 2nd grader would not be able to actually pull that together to draw it, but they can, and they know if I'm making one they'll be like make sure that this color is here and that color is there, and those lines, like they know, they really do know." [Col Lines 493-496]
4A	"And it also gives them less anxiety so they're concentrating on performing and putting down whatever they know without feeling the anxiety which I feel that the ELL's have is oh my God I can't read that." [Col Lines 599-601] "Or is it enough, did I write enough on the paper." [Col Line 602]
4A	"Oh my God, you're not going to be able to help me and it's anxiety so they can't even start the task because they have that, but then they feel this comfort level with the circle map, especially when you tell them that they can use whatever map they feel comfortable with and at some point they all go to the right one." [Col Lines 603-606]
4A	"...the accessibility--you could have the child that can write a whole paragraph under one thing, with a child like that maybe can draw their answers not necessarily write them out. So if a child never feels like I can't do this, I can't answer this, they're like oh I can do it. Yeah, maybe you can do it but I don't think I can, or at a different level…" [Col Lines 611-615]
4A	"It almost erases for me the boundary of she's doing it better than I am because she has five sentences and I have two. No, we all have information and different information." [Col Lines 617-619]
4A	"You just give it to them, so it's constant review because it's something they know, they know how to do it." [Col Lines 634-635]
4A	"Some of them do…they understand we could do a cause and effect…it's really just lovely and makes me feel really good to see…2nd graders, such little ones that a lot of times are thought of as so little and they don't have that—what can they do—to just come up with all these ideas and ways of presenting it and feeling so proud of themselves. It's amazing." [Col Lines 651-656]
4A	"…it's still very basic [for "some of them"], but they all have something to write so they're not sitting there struggling…you've broken it down so they have a place to start and something to contribute and then for some kids it does take them to a much higher level." [Col Lines 889-893]
4A	"…the feeling that this little girl gets, 3rd grade, you would think what was she able to accomplish...she's showing that she can do something that everybody else in the class is. The confidence level in her has changed so much from September to now…"[Jef?]

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4B	"It's just a great way for her to be able to share the limited English that she has now and being able to express it in her words with her writing, on her paper, and be able to have it hung up like everybody else as a first step…it's worked very well with her I have to say."[Jef?]
4B	"…that [enjoyment] makes them want to stay focused on their work and actually accomplish it." [Col Line 224]
4B	"You can walk away and they're not sitting and waiting for you to come back and work with them, they're working really well on their thinking maps." [Col Lines 340-341]
4B	"Our expectations for students have really increased and with our expectations being higher students work to achieve that because they know that's what we expect and they start to expect that of themselves and having these tools like thinking maps allows them to get to that level and really express themselves and I think it does allow them to understand the academic language and…vernacular and internalize it and use it in turn." [Col Lines 554-559]
4B	"And it also gives them less anxiety so they're concentrating on performing and putting down whatever they know without feeling the anxiety which I feel that the ELL's have is oh my God I can't read that." [Col Lines 599-601] "Or is it enough, did I write enough on the paper." [Col Line 602]
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4B	"…it's still very basic [for "some of them"], but they all have something to write so they're not sitting there struggling…you've broken it down so they have a place to start and something to contribute and then for some kids it does take them to a much higher level." [Col Lines 889-893]
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4D	"In the older grades I saw that happen…you can see the kids going oh okay, I'm going to use a double bubble on that and it's kind of self mediating." [Jef Lines 260-263]
4D	"…I've been here a long time and I love the way everyone has embraced this…being in 5th grade now I would say especially this year my students can tell me…we could put that in the flow map…So now that they've been exposed to it over time, they're learning how to think which is such an unbelievable thing for…especially the ELL's going into middle school when they're going to be having to take notes and to know what to do with language, and now they know when they're reading a passage and when we're studying for our tests they know what to do with this piece of text and how to organize it and how to think about it, which I think it's phenomenal…" [Col Line 184-193]
4E	"In the older grades I saw that happen…you can see the kids going oh okay, I'm going to use a double bubble on that and it's kind of self mediating." [Jef Lines 260-263]
4E	"It's being able to internalize it and then to use it on their own." [Jef Line 285]
4E	"In their own reading to really be able to understand once they get into those upper grades, your science and your social studies books, and then how to internalize that information and what is this paragraph talking about because you could be reading a five paragraph article and each paragraph is used, is one may be defining, one may be comparing and how to use it to be able then to understand it, to study it, to acquire the vocabulary of it." [Jef Lines 287-292]
4E	"…it gives them ownership at this point where we are now, it's been a few years, and you can just give it to them and they can run with it, they don't need any more explanation on how to use the map and then they're just responsible for the information which I think gives them a sense of autonomy and independence…" [Col Lines 247-256]
4E	"They know them and even the flow map, and then the other four they slowly, they know of them and they've used them, but we really push them and then by 3rd grade they really do have it. I think the other thing that I find particularly exciting is when the kids can pick what map they think is appropriate and that you can say to them gee we are like comparing like some two things and like I wonder what kind of, I wonder if we could use a map and then they're like double bubble…they know it…I think it's been certainly the most motivating tool that we have had." [Col Lines 274-281]

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4E	"You can walk away and they're not sitting and waiting for you to come back and work with them, they're working really well on their thinking maps." [Col Lines 340-341]
4E	"But it's like when state tests…they have maps on the ELA, so they have to be able to follow the directions for the graphic organizer…" [Col 832-833]
4E	"It's just a great way for her to be able to share the limited English that she has now and being able to express it in her words with her writing, on her paper, and be able to have it hung up like everybody else as a first step…it's worked very well with her I have to say." [Jef?]
4F	"…when it comes to academic language, when you're building the map there's this layer of just focusing on the vocabulary." [Jef Lines 163-165] "…but then you layer in the connecting words that make those sentences and make those ideas, and it's that kind of layering that allows a kid to build the complexity of the academic vocabulary." [Jef Lines 176-178]
4F	"In their own reading to really be able to understand once they get into those upper grades, your science and your social studies books, and then how to internalize that information and what is this paragraph talking about because you could be reading a five paragraph article and each paragraph is used, is one may be defining, one may be comparing and how to use it to be able then to understand it, to study it, to acquire the vocabulary of it." [Jef Lines 287-292]
4F	"…if I were to have to teach all of these maps [to my ESL groups] and if it was not a school initiative it probably wouldn't really apply only because of the lack of time and so much to do." [Jef Lines 428-430] "…now we're going, let's define it, what does it mean…the 1st, 2nd graders they know what it is and it's that modeling of the language…and then it translates into their writing…" [Jef Lines 432-437]
4F	"We just came up with figurative language, my kids did a lot of similes and metaphors and they're finding them and adding them to their tree maps and they keep growing." [Col Lines 457-459]
4F	"…even if they don't use the words like compare and contrast, if I say it they automatically look up at the map...even if they don't use the words they know the words, they know what they mean and they know what they mean to do…" [Col Lines 521-526] "[...They know] what the thinking is." [Col Line 527] "What the thinking is in order to explain." [Col Line 528] "…which in essence is more important than them being able to verbalize contrast. They know what it means and they know what to do with their thinking."

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4F	"Our expectations for students have really increased and with our expectations being higher students work to achieve that because they know that's what we expect and they start to expect that of themselves and having these tools like thinking maps allows them to get to that level and really express themselves and I think it does allow them to understand the academic language and…vernacular and internalize it and use it in turn." [Col Lines 554-559]
4F	"What's interesting is I find myself thinking more about using thinking maps as I'm teaching…something that maybe I didn't think before…So they [2nd graders] really got into it that way and they really understood inferencing and now when we're doing something they're like…are we going to inference… [Col Lines 638-646]
4F	"Some of them…understand we could do a cause and effect…it's really just lovely and makes me feel really good to see…2nd graders, such little ones that a lot of times are thought of as so little and they don't have that—what can they do—to just come up with all these ideas and ways of presenting it and feeling so proud of themselves. It's amazing." [Col Lines 651-656]
4F	"…if I were to have to teach all of these maps [to my ESL groups] and if it was not a school initiative it probably wouldn't really apply only because of the lack of time and so much to do." [Jef Lines 428-430] "…now we're going, let's define it, what does it mean…the 1st, 2nd graders they know what it is and it's that modeling of the language…and then it translates into their writing…" [Jef Lines 432-437]
5A	"I think we received really good training. I have to say that, and I haven't gone for advanced training as desperate as I would love to, but I just haven't. I feel like I was well trained in something so much that I could explain it to somebody else and share it with them." [Col Lines 164-167]
5A	"In terms of the training though, Larry was very explicit and he used his own life and then he had us use our own experiences to do each of the maps, so we had a personal relationship with the maps before we even went to any kind of academic work with the maps. " "So we felt familiar with them, we felt comfortable with them, we liked them and then we used them for something else." [Col Lines 178-182]

Code	Quotations
5A	"We just started foundations and foundations training and we're all getting it from K to 2 and we'll have to see, and a little into 3, and we'll have to just see if in this same way we can lay the groundwork and build and build so that by the time the kids come, like I was writing my reflection, by the time kids come in year 3 of foundations I would like to know that I could just say, you know, get your writing, or whatever, any little thing and people would know what that meant and do it. So we'll have to see cause this is the first time I have felt so supported by my colleagues and system in getting something accomplished ["with thinking maps." Col Line 708]." [Col Lines 699-706]
5A	["…what are the specific strategies. Think in terms of foundations, what would be the strategies so that you would be just as effective the same way?" Lines 709-711] "Training." [Col Line 712] "And everyone getting their own materials, you don't have to share…" [Col Line 716] "…we…started…we kept it our secret right…it was…the ESL folks first, 'cause I knew it would spread like wildfire, but I figured this was my entrée because schools work by enthusiasm…when people get very enthused it has a viral effect…we used to talk about that, this is how we would start introducing this, and also because of finding funding…" [Col Lines 718-722]
5A	"…they want somebody to take it down and they'll say oh you can't have that up there. But it's the kids' work, it doesn't matter it has to be checked, that's not correct, take it down, fix it and put it back up." [Col Lines 763-766] "We're sensitive because we know it works and we don't want a child to come up with the wrong training." [Col Lines 770-771]
5A	"I love in the training first of all that we were all trained together because a lot of times it's, you know, the grade level leader goes, or someone goes and we didn't have that, so I loved that we all go our own materials, we were all introduced to it the same way, I thought that was really great." [Col Lines 260-264]
6A	"…what we've done to get teachers on board…I think the common language, the fact that we all began working on thinking maps together and moved through those phases together…first of all there's a common language among colleagues which means that you can go to pretty much any colleague and say…remember when we [didn't] know I'm using the circle map, do you think I'm using this right…" [Jef Lines 45-51]

Code	Quotations
6A	"…you could see where you could use the thinking maps in all areas of the curriculum no matter what you were doing, whether it be math, literacy, science, and developing things that…not only was the common language but when Larry did charts that would have posted too because I remember sometimes even thinking within I would refer to the charts and then the definition…what am I teaching, what do I want these children to know, so which is the map to use." [Jef Lines 71-76]
6A	"Like three or four maps that I always use and then the rest, ah I don't use them so much." [Jef Lines 123-124]
6A	"But as we're getting more comfortable we're like willing to try it in different ways where like a couple years back we wouldn't. We would call Larry and be like can we do this, you know, but now it's like well try it…" [Col Lines 302-305]
6A	"We actually use the brace map for parts of a story." [Col Line 317] "This year for the first time and I never used it." [Line 320]
6A	"…one of the big things that 2nd grade does is we meet a lot and we share a lot of our ideas...we're always bouncing off of each and so it really helps to kind of grow. If I show Hildi one of my maps and she's like oh that's really good but what if we add this, oh well that's something that maybe I didn't think about and so I think that that keeps us growing…" [Col Lines 372-377]
6A	"…I think that would be a good idea because like what you guys said about the story elements like to have a time for the whole school to share because if we weren't here I never would have thought about that." [Col Lines 378-380]
6A	"We tried to because Larry, we went to a training to have teacher leaders in each grade and we've tried and it's just, you know, you get so bogged down with everything, we've tried to have a part of a faculty meeting or have our own meeting to come up with some school strategies to keep everybody going." [Col Lines 385-388]
6A	"I think just people like sitting around talking like this, I feel like there's never a chance for like different grade levels to sit around and just talk about it." [Col Lines 389-390]
6A	"That's how I get inspired a lot of times by looking at people's maps that they put out and I just think I wish sometimes I could take notes and just like we could put together, it would be so awesome, you know Scholastic has those teacher research books so we should make one about, Larry should make one about thinking maps and sell it to Scholastic and have photos of all the things that he always takes." [Col Lines 394-398]

Code	Quotations
6A	"…when I thought about the main idea I was trying to figure out how to do main idea supporting detail and which map to use, I couldn't figure it out. So I went and I asked a teacher in the hallway, come in the room, this is what I'm trying to do, look at these maps which one should we use…" [Col Lines 415-418] "…she was like why don't you use a brace map. I was like oh that's perfect. She hadn't thought about it either but the two of us together we came up with the brace map and I was like this is perfect and then I went to every person in my grade level and I told them for a main idea try a brace map. So we've all tried it and I mean it stopped at my grade level I probably could have gone other places, but for that kind of when you do come up with something that could work for everybody, we're all working on main ideas, we're all doing those things. If you find something that works share it…" [Col Lines 422-429]
6A	"…I feel like it's made me a much better teacher in the sense of being able to attain that goal because my path to get to that goal is…clearer now." [Col Lines 574-581]
6A	"What's interesting is I find myself thinking more about using thinking maps as I'm teaching…something that maybe I didn't think before…So they [2nd graders] really got into it that way and they really understood inferencing and now when we're doing something they're like…are we going to inference… [Col Lines 638-646]
6A	"You're all really well trained in it [the Turk] so you can see the difference in the kids moving up in the math." [Col Lines 735-736]
6A	"…we still have meetings [on the Turk[?]]…" [Col Line 737]
6A	"…we still have a lot of talk about it [the Turk[?]] and a lot of cross talk…" [Col Line 738]
6A	"…some of us get really upset [when a map is not used correctly]…" [Col Line 762]
6A	"…they want somebody to take it down and they'll say oh you can't have that up there. But it's the kids' work, it doesn't matter it has to be checked, that's not correct, take it down, fix it and put it back up." [Col Lines 763-766] "We're sensitive because we know it works and we don't want a child to come up with the wrong training." [Col Lines 770-771]
6A	"…we have to make sure other people coming in continue to receive the training." [Col Lines 779-780]

Code	Quotations
6A	"I liked being able to just talk to other grades not just my grade…" [Col Line 946]
6A	"...when you said ELLs...I was like I never really think of my classroom that way [because of the use of TMs]." [Col Lines 539-540] "We don't anymore." [Col Line 542] "Right, we really don't." [Col Line 543]
6C	"…with this blueprint [i.e., the TM] ["it's kind of ambiguous" [Jef Lines 367-368]]…you have this kind of framework that…you're using…to benefit the kids, but I find that I probably gain more benefit in my clarity, or you know being clear to the kids when I have to work through the thinking map." [Jef Lines 374-377]
6C	"You're able to deliver a really clear message and as the kids use the maps throughout the grades think about how easy it is for…a 4th grade teacher who's meeting with her kids for the first time, but most of those children were in the school last year and you just have a circle map and put your name in it and off you go and barely any directions are necessary." [Jef Lines 378-382]
6C	"I have to say that I probably benefit more, I don't know, I find that actually works better for me in my delivery of teaching and even organizing lessons. The kids benefit too, but I find that I'm actually quite reliant…" [Jef Lines 391-393]
6C	"I go home and I do the same thing because if I have to sit with my teenager and I look at something, I'm immediately in my head going to a map because then I could organize my information, organize my thoughts and get it down and when you're thinking about lesson planning too, it really does help you to plan your lessons to be organized, to deliver a lesson that really carries some weight with it so that you can let's say maybe pack several punches, do you vocabulary development, your comprehension all ties into that." [Jef Lines 402-408]
6C	"…maybe another thing that helped us really buy-in, not really buy into the whole thinking maps, is dealing with the community and the population of the kids that we work with I felt that these maps were concrete in ways that allowed every single child in my classroom to express their ideas, get their ideas, and really go deeper into their thinking, and not only did it help them it helped me to look through their work." [Col Lines 195-200]
6C	"However, knowing that alright I'm going to teach this through this thinking map, it really narrows down in a way the focus for me and it helps me build and work on different areas to vocabulary and things like that to allow my students to really understand." [Col Lines 574-581]

Code	Quotations
6C	"It makes it easier, an easier way to review. It's reading response journals, you can just give thinking maps...make it their own." [Col Lines 631-632]
6C	"...it's true, it makes it so much easier [to review]." [Col Line 633]
6D	"…we've internalized it so much…I would say…We really embraced it." [Jef Lines 396-400 (Conversation)]
6D	"I go home and I do the same thing because if I have to sit with my teenager and I look at something, I'm immediately in my head going to a map because then I could organize my information, organize my thoughts and get it down and when you're thinking about lesson planning too, it really does help you to plan your lessons to be organized, to deliver a lesson that really carries some weight with it so that you can let's say maybe pack several punches, do you vocabulary development, your comprehension all ties into that." [Jef Lines 402-408]
6D	"…the map itself was not the thing but that the map was going to be this entrée to all this other stuff, to all the language development and all the cognitive processing that the kids were going to be exposed to and I think that that made it very attractive to us because it wasn't just going to be a replacement for graphic organizers, even though they looked like it on the surface. That it was clear from the beginning that it was more than just what we saw on the surface but that it was a much deeper thing and that we were going to have a lot of exposure to it." [Col Lines 157-164]
6D	"It's nuts, it's so simple." [Col Line 293]
6D	"…we're planning for the literacy fair that's going to be in May and so we all have our topics, so like for me to figure out my topic I sat there and started making my maps. Like okay map this is like one idea that I could use for this map and this is one, and it helped me organize where I'm headed for my own work. So that was kind of amazing to me." [Col Lines 342-346]
6D	"I wish I had this in grad school." [Col Line 347]
6D	"I wish I had it college and grad school…I didn't do poorly but it would have helped me so much…just getting through the dense texts." [Col Lines 349-350]
6D	["I don't know if you know that they're training the high school." Col Lines 360-361] "I'm so happy to hear that…" [Col Line 363]

Code	Quotations
6D	["…what are the specific strategies. Think in terms of foundations, what would be the strategies so that you would be just as effective the same way?" Lines 709-711] "Training." [Col Line 712] "And everyone getting their own materials, you don't have to share…" [Col Line 716] "…we…started…we kept it our secret right…it was…the ESL folks first, 'cause I knew it would spread like wildfire, but I figured this was my entrée because schools work by enthusiasm…when people get very enthused it has a viral effect…we used to talk about that, this is how we would start introducing this, and also because of finding funding…" [Col Lines 718-722]
6E	"…you could see where you could use the thinking maps in all areas of the curriculum no matter what you were doing, whether it be math, literacy, science, and developing things that…not only was the common language but when Larry did charts that would have posted too because I remember sometimes even thinking within I would refer to the charts and then the definition…what am I teaching, what do I want these children to know, so which is the map to use." [Jef Lines 71-76]
6F	"Teachers also tend to fall back on the maps that they're most comfortable with. But if we had this in place we would know at least for the first eight weeks every child would be exposed to every map, every teacher would then have an activity built upon every map, and possibly the children would be able to utilize them more sooner rather than later throughout the year." [Jef Lines 105-110]
6F	"…always teaching a map as it arose…and its particular topic…reading, math, science, social studies…you're getting maps here or there, but we said maybe it would be better to actually have a full week of each map discussed like we do with our program in reading only because I think that what happens is they tend to focus on the same maps." [Jef Lines 101-105]
6G	"[When known incorrect use of TMs is allowed to linger] That means that it's not important…" [Col Line 776]

Appendix L

Individual Interviewees' Quotations

Code	Quotations
1B	"...they can internalize the vocabulary and the names of the maps…" [H&E Lines 27-32]
1B	"…the nature of the maps and how it's set up gives you that language to give them as lifelong learners…" [V&L Lines 313-314]
1B	"…that whole academic language is just so embedded in what they're doing and because they're doing it since kindergarten it's really becoming part of their learning, part of their thinking processes." [V&L Lines 333-336]
1B	"I automatically go to the language of the map." [AC? Line 177]
1B	"…you're so used to repeating yourself over and over and every different word that makes them think of a bubble map, or a tree map…" [ER Lines 174-175]
1B	"…the map again dictates some of the language that you're going to use. Certainly if you're doing a bubble map you're going to be talking about adjectives, those special words. Remember we want to describe the character…certainly you'll hear words like that…" [H&E Lines 390-393]
1B	"…the language triggers also the map." [V&L? Line 346]
1B	"…already they're creating in their minds their own map because we have the language there and then all of a sudden it all connects and then it connects to a map." [V&L Lines 352-354]
1B	"I think it helps them to focus like I know those are the words that she expects us to use because those are the words that are on the map." [AV Lines 298-300]
1B	"They know cause and effect is multiflow, they know classifying is a tree map, so they already know those words, even though those are words that 3rd graders might not have known before." [H&E Lines 402-404]
1B	"But with the thinking map it helps you zoom in." [Line 203] "…being able to kind of weed out the language that they really need and represent it in a structured, simple way for them to understand." [AV Lines 205-207]
1D	"I put up a double bubble map they know automatically we are comparing two items." [H&E Lines 46-47]

Code	Quotations
1D	"…it's almost part of our thinking...our thinking aloud about it...try and develop an understanding together." [V&L Lines 87-89]
1D	"So I think it's really clarified…it for a lot of students whether they're ELLs or whether they're reading at a 3rd or 4th grade level. I think thinking maps helps kind of mesh all of [the "parts of the sentence" Line 156] together." [AV Lines 163-166]
1D	"…at times I feel like it saves you work and it certainly saves the 2nd grade teachers work when they come and they know this…it's a common language…it really does carry over from year to year." [H&E Lines 312-316]
1D	"In the upper grades…all the time I used to say, no matter what book they were reading, here's your homework." [H&E Lines 476-478]
1D	"…there's no frustration…they're so comfortable…they've heard it over and over again…This [having TMs in the classroom] all just seems such the flow and it's a common language, it works." [V&L Lines 286-289]
1D	"I don't think we really see any watering down, I think it's definitely richer than really looking at some of the more complex vocabulary and looking at its use and its meaning and how it's pertaining…" [V&L Lines 300-302]
1D	"…I think having created these types of maps really helped them to understand what a synonym is because now it's spelled out in an easier way, not telling them it's the same, you know, they're seeing it." [AV Lines 140-143]
1D	"…there are concrete visuals, so who doesn't respond to that…it's just only natural that they would know what the expectations are when they can clearly see what needs to be done and I think that the cumulative effect is great because it's a common language…" [H&E Lines 567-574]
1D	"…two girls will turn to each other and maybe say it in Spanish and then try and get the English word out or they'll get a picture out or something." [V&L Lines 144-146]
1D	"…my ESL students…work so well with everybody else that there no separation between them so it's a nice feeling to know that everyone is learning in their own way without being set aside for being an ELL student or ESL student, but at the same time they do have extra support." [AC Lines 95-99]
1D	"…what I found for our ELL students that's very helpful is making visuals for them on cards." [H&E Lines 359-360]

Code	Quotations
1D	"I think they know their task is harder than somebody who's a native English speaker because they're learning a second language." [H&E Lines 264-265]
1D	"...they know that they can also illustrate, that the spelling doesn't really matter, that they can get their thoughts on paper...so they're...able to recall certain details that are important." [ER Lines 98-103]
1D	"…we make a huge letter book with just coming up with the letters and the pictures that go with them with the sounds." [SM Lines 28-31]
1E	"…sometimes when they do a thinking map I'll make them do a sketch…show me what that looks like because sometimes if they're having difficulty expressing it in words you can know if they understand by the drawings that they do, and they put little words in." [ER Lines 116-119]
1E	"I think [teaching with TMs has] made me slow down a little bit but in a good way because they're still understanding everything and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have visual, you know, you have oral cause we go over it and then they can see it so they can connect and then drawings if need be. So I just think that it's made me more able to differentiate, scaffold the instruction and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody." [AV Lines 176-183]
1E	"…if I want them to put a story in sequential order I'll have the sentences cut up and arrows children will be arrows, children get in another room, they're all mixed up and the children who are sitting down have to figure out…oh move Susan to the third spot and then move Joe to the front and then, so they're and then everybody is moving…" [H&E Lines 360-365] "…everybody's feeling it and they become the map…" [Line 367]
1E	"The pictures are really important." [Line 371]
1E	"Some of them…if they're drawing pictures and labeling them I'll know that they understood." [ER Lines 283-284]
1E	"…you want them to really…just understand and grow with it instead of feeling…negative about themselves. So…I let them express their answers in different ways…" [ER Lines 288-290]
1F	"I use them [TMs] basically for all subject areas, but rely on them for particular content types of things." [V&L Lines 18-19]

Code	Quotations
1F	"…if I'm doing that in literacy right away they know I'm comparing characters, if I do it in another subject they'll understand what I'm trying to do there." [H&E Lines 47-49]
1F	"…using it in many different applications and many different parts of the curriculum…" [H&E Lines 57-62]
1F	"I definitely try to use the maps in every curriculum area." [Line 316]
1F	"…they do have personal experiences with the maps and then gradually we move them over to using them academically." [AC Lines 159-160]
1G	"They're able to express themselves in their own time…" [H&E Lines 7-11]
1G	"I taught many years 4th and 5th grade and that's where I started with the thinking maps and now I teach 1st grade. This is my second year in 1st. It's very different for several reasons, you know, the age of the kids and the skill level of the children varies greatly from 1st to 4th and 5th." [H&E Lines 13-17]
1G	"And the fact that they've also been using this as when they were…kindergarten, 1st grade…" [AV Lines 107-108] "…that one's a hard one but they come already prepared and at least exposed to the majority of the thinking maps." [AV Lines 112-113] "…they come in already having a base, so it's my job to kind of push them to the harder ones that they might not have seen a lot." [AV Lines 115-116] "…and explore, you know, like not so superficial, it's all about me…" [Line 118]
1G	"And he was one of our issue child." [AV Line 125] "He's a handful, he's one of the kids that he's reading at a kindergarten level and that's what he's pulling...we give him a book and you have to give him like a D/E level and he was able to do this by himself." [AV Lines 127-129] "I was [impressed] because it also shows me that he's understanding the language…" [AV Line 131]
1G	"…if they use pictures which they really don't have to do anymore, but if they use the pictures and they put them in the correct space on a bubble map…to show what the character felt like or to describe…how the character was..." [AC Lines 81-87]
1G	"So I think it's really clarified…it for a lot of students whether they're ELLs or whether they're reading at a 3rd or 4th grade level. I think thinking maps helps kind of mesh all of [the "parts of the sentence" Line 156] together." [AV Lines 163-166]

Code	Quotations
1G	"…what's really wonderful for children with special needs because there's not the pressure of producing an enormous amount and the thinking map allows you to express what you have inside of you, what you can offer…even if they're working with someone and they can offer maybe two pieces it's there,.." [V&L Lines 236-242]
1G	"We could also use it at their skill level, we can the application of it whether it be whole group, partner, small group, just not with words, pictures…" [V&L Lines 245-246] "…taking the child where they're going to be successful using it and understanding it." [V&L Lines 249-250]
1G	"There's an entry point for everyone, so everyone is successful on whatever level." [Line 259-260]
1G	["…during your application can you tell me a little bit more about this question about during the application of thinking maps you've also developed thinking skills and differentiation." V&L Lines 263-265] "Differentiation works beautifully or vice versa, it all works together because…if you have an ELL student, if you have a special needs student…there's a way for them to get access to what they need to get access to and then to help produce what they can produce." [V&L Lines 267-271]
1G	"I would actually use them [TMs] more with them [special needs children]." [Line 162] "And if I had small groups with them that would be something that they can handle more than they can…opening a textbook and trying to answer questions." [ER Lines 164-165]
1G	"…as the complexity of the tasks increases as you go through the grades, there's more opportunity for the student to choose their map and think critically about a task." [H&E Lines 470-472]
1G	"…you want them to really…just understand and grow with it instead of feeling…negative about themselves. So…I let them express their answers in different ways…" [ER Lines 288-290]
1H	"…because they already knew it, I didn't have to explain it to them. I didn't have to take that time away from the meat of what I was trying to teach them." [V&L Lines 69-71]
1H	"…I used to tell the children which map to use and now I let them choose...it gives the ownership to them to decide how they want to interpret the information…" [AC Lines 19-22]

Code	Quotations
1H	"…always demonstrating prior to any lesson." [H&E Line 137] "They'll see it visually and then when they choose to write they're more comfortable doing that and they all do share at their team, they have a partner to talk it over with first and then the writing comes after." [H&E Lines 141-144]
1H	"…not only are they [students] learners, they're teachers…" [Line 205]
1H	"…years back when I worked in the guided reading group, a lot of times…when I sat with a group I'd have to ask them questions and we'd go back and forth about the questions and now what I can do is have them write a map, choose a map and when they fill in the map, when they show their thinking on the map and then they show their evidence in the frame it's not me leading them with questions, it's them picking out the things that are important and I'm not telling them what's important, they can pick that out for themselves because they have a way of representing it…" [AC Lines 108-115]
1H	"…what's really wonderful for children with special needs because there's not the pressure of producing an enormous amount and the thinking map allows you to express what you have inside of you, what you can offer…even if they're working with someone and they can offer maybe two pieces it's there, it's solid, it's theirs, they can claim it they can own it..." [V&L Lines 236-242]
1H	"…we let them be teachers, we let them be, we take a step back as an observer and they jump in and they take ownership which is the biggest thing." [V&L Lines 242-244]
1H	["Yeah, and it helps them build confidence." Line 155] "Absolutely because then it's not the teacher watching them, they can actually learn from another person, which I think is important kids learn from each other." [ER Lines 156-157]
1H	"…some students in here will be able to write me a three paragraph essay on something without a problem. Then you have…struggling ELLs that can't, so I will let them write me a three paragraph essay using a tree map." [ER Lines 268-271]
1I	"…it made my teaching clearer, and their understanding better, and their vocabulary, and just in terms of the organization of what's going on in their minds to organize even from stories to letters to rhyming words and to how things came together, and just a whole process of learning." [V&L Lines 38-41]
1I	"...the maps themselves are quite clear as to what you do and what's it going to look like." [V&L Lines 44-46]

Code	Quotations
1I	"We use for these children a lot of pictures and I'll do a lot of sorting….if we're talking about some subject first before we try to break it down or anything we'll just get everything we can about it and then however it is then we'll say okay well which things go together and how can we put them together. So that's one thing is giving them the ideas and then just having them say try to figure out which ideas go together and work from there." [SM Lines 46-52]
1I	"…if I gave them the words they could sort them into where they belong on the map…" [AC Lines 72-75]
1I	"…we did a tree map on nouns and verbs." [AV Lines 146-147] "It helps them understand that these two, they're part of the English language but they mean different things, and they do different things and they explain different things. So it helps English language learners really kind of start thinking of oh so I can't say ran cheap or you know, it helps them with the structure." [AV Lines 149-152] "…with I guess the syntax and things like that…" [Line 154]
1I	"…all the maps are the tools that they're using…if you are doing a bubble map and you're expecting adjectives to describe a particular item...But there are specific ways to use these maps, you can't just use them any way you'd like, there are different maps for different purposes." [H&E Lines 203-209]
1I	"…it all worked really well in just organizing their thinking..." [V&L Lines 30-31]
1I	"…[working with TMs] makes their writing clearer...all of our students have a difficult time expressing themselves clearly in the writing. Even expressing themselves orally. The thinking maps, the visual of it…because it puts all their thoughts down then they have this visual and then they're able to express themselves through oral language and in writing clearer and more consistently with more support and details." [V&L Lines 221-227]
1I	"It helps me to narrow it down…if I have a thinking map I get to the single detailed points that they need to know which I think helps the ELLs, because I think when you go…on and on about a topic the ELLs probably hear a third of that, they're still trying to process what you're saying." [AV Lines 197-201] "But with the thinking map it helps you zoom in." [Line 203] "…being able to kind of weed out the language that they really need and represent it in a structured, simple way for them to understand." [AV Lines 205-207]
1I	"…they'll get it as long as we have the problem, there's got to be a problem and so when they get stuck with that map they'll say…what's the problem…" [AC Lines 186-188]

Code	Quotations
1I	"What I think is good for the ELLs is that they know that they can also illustrate, that the spelling doesn't really matter, that they can get their thoughts on paper, and they feel a lot more confident about it because they're not constantly worrying about, well I spelt this wrong and am I saying it properly, and it's not full sentences, so they're just able to recall certain details that are important. So I think it's beneficial for them especially." [ER Lines 98-103]
1I	"…I like to use the thinking maps a lot for writing…to give them that reference so that they can recall the words and use them in a meaningful way…I think they know what's expected of them at this point." [H&E Lines 523-528]
1I	"…when they're going to grapple with the passage from ELA…there's a way to think about it and so that it's not frightening, it's not threatening and they can…synthesize all the information they have, allow it to make sense to them and then…answer questions or…comprehend the information." [V&L Lines 425-429]
1I	"…in the writing I think sometimes in their minds they're thinking about it but it is not in a clear concise way. Their thinking is all over the place so their writing comes out all over the place, you get beginning, middle, details, a whole jumbled mess, but the thinking maps makes it clear for them to write in a sequential matter that makes sense, that's adding details, it's putting in vocabulary that makes it clear." [V&L Lines 432-437]
1I	"…it's just a more comfortable feeling for them, they know what's supposed to be on the map and they can pick apart even more challenging work to put into the map because they know what belongs there. So I think it takes away some of the fear of just being out there on their own with new information. It makes it a little more familiar even if it's not." [AC Lines 265-269]
1I	"…with thinking maps they now have a structure to follow and they know order, I need to do this. So it's an immediate connection and they know exactly what they have to do so I think it helps them retain the information and I think that it helps them understand…" [AV Lines 341-344]
1I	"…it's a way for them to organize their thinking and if they can organize their thinking and understand their thinking then they're going to achieve no matter what." [AV Lines 346-348]
1I	"...what shows me that the ELL students understand what map to use is that...it's structured and scaffolded..." [AV Lines 96-102]
1J	"Now what I need to work on more is the next step after they've built the thinking map...I really need to get them to okay good we've built the maps, we know what to use the maps for but now what's the point of them...deconstructing and constructing again." [AV Lines 31-37]

Code	Quotations
1J	"…it's these kinds of conversations that are happening…in which the teaching and the language and then even with talking about not just the vocabulary but why it's happening and when going into the cause and the effects and more of the inferential type of thinking processes." [V&L Lines 93-96]
1J	"And it's nice when they are bouncing ideas off each other how they convince their partner, or how they become convinced of another way of thinking." [AC Lines 47-48]
1J	"…yesterday I said well how will we do setting if you wanted summarized setting for me with a thinking map, so one students said well, I could do a circle map and just write down all the things that happen in different places and times. So then somebody else said well you know what, we could do a tree map, and it could say setting and it could say time and place." [ER Lines 50-54] "So that shows me that they're thinking and they're thinking in that context." [ER Line 58]
1J	"We use for these children a lot of pictures and I'll do a lot of sorting….if we're talking about some subject first before we try to break it down or anything we'll just get everything we can about it and then however it is then we'll say okay well which things go together and how can we put them together. So that's one thing is giving them the ideas and then just having them say try to figure out which ideas go together and work from there." [SM Lines 46-52]
1J	"…knowing how to use the map and think about it they look for the language, so they're constantly searching in their own head in their own vocabulary." [V&L Lines 141-143]
1J	["So they're just not like there saying oh my God I don't know anything. You don't get that feeling from them." H&E Lines 247-248] "No they're not in a panic they're really thinking, I almost see like the wheels turning in their brains and…" [H&E Lines 249-252]
1J	"Well a lot of times we will use groups, either big groups or smaller groups…they can bounce ideas off of each other and that usually helps to pull it into a bigger idea. And also again, the questioning on how did you get that and what can we use for that and how can we make it better, and what do you think." [SM Lines 120-124]
1J	"…there's different vocabulary and just a deepening of the understanding, like deepening of the learning, deepening of the language." [V&L Lines 304-306]
1J	"…as the complexity of the tasks increases as you go through the grades, there's more opportunity for the student to choose their map and think critically about a task." [H&E Lines 470-472]

Code	Quotations
1J	"…when we're discussing a map, we'll take a few pieces off their map. I say highlight a couple of ones that you would like to discuss or even to write about, and then again bringing it into greater detail and greater depth. Now let's talk about that piece or lets have a conversation, or even draw those pieces out." [V&L Lines 397-401]
1J	"[Using Thinking Maps] draws a focus." [Line 438]
1J	"Sometimes they end up having a Ven diagram…so we haven't really worked with any of those kinds of diagrams, so the challenge is to get them to transfer what they've been working…with thinking maps to other." [AC Lines 283-285]
1K	"…with my purposeful language the students get a chance to…think about the map and think in terms of that. So it's already become a part of their thought process to think like that and…it allows all that inferencing, that synthesizing of information to happen almost naturally because that's how it all…flows beautifully…" [V&L Lines 108-113]
1K	"…they're listening and they're putting their thoughts together as well." [V&L Lines 177-178]
1K	"…the fact that any of my children last year you could pull them aside and say can you tell me about the parts of a butterfly and they could…explain each and every part and they used the words…of the life cycle because they created it, they wrote it, they learned it, they acted it out and their ability to tell you and that's the only, I mean really they put it together, but they also, you know, their words." [SM Lines 82-87]
1K	"They're able to take that knowledge and then apply it in their writing…" [V&L Lines 211-212]
1K	"…the nature of the maps and how it's set up gives you that language to give them as lifelong learners…" [V&L Lines 313-314]
1K	"…when they're going to grapple with the passage from ELA…there's a way to think about it and so that it's not frightening, it's not threatening and they can…synthesize all the information they have, allow it to make sense to them and then…answer questions or…comprehend the information." [V&L Lines 425-429]

Code	Quotations
1K	["…have you noticed a difference in terms of how kids are managing that assessment [ELA] in their reading or their writing as a result of the acquisition of all these skills?" V&L Lines 442-444] "…especially…in the writing component…because they're…given pictures and given questions…these thinking processes help them to see how these two pictures are related, seeing the relating factors how they're the same, how they're different, what's the theme so it's bringing their thought processes clearer, putting it more to focus a better understanding." [V&L Lines 445-450] "…manage their ideas…they might get so overwhelmed so…if they can think about it in terms of a map…and it really only takes a very short time to do that…then they're able to go and to get a focus…and to stick to that focus…" [V&L Lines 452-458]
1K	"…they can use the maps to help them think about unfamiliar information." [AC Lines 261-262]
1K	"…it's just a more comfortable feeling for them, they know what's supposed to be on the map and they can pick apart even more challenging work to put into the map because they know what belongs there. So I think it takes away some of the fear of just being out there on their own with new information. It makes it a little more familiar even if it's not." [AC Lines 265-269]
1K	"…with thinking maps they now have a structure to follow and they know order, I need to do this. So it's an immediate connection and they know exactly what they have to do so I think it helps them retain the information and I think that it helps them understand…" [AV Lines 341-344]
1K	"I feel that as a building since everyone is using this now by the time I see them in 5th grade it's an excellent tool, and I think it's going to be beneficial to them going to middle school." [ER Lines 31-33]

Code	Quotations
1K	"I think that it's going to influence them for a long time because what we're teaching them is not just the rote of school work but how to think forever so that when they read something they're going to be able to know what it is that they're reading, are they comparing something, are they describing something and it gets to be so important and I can see that looking at my own children, looking at me I wish I had this when I was in school cause I feel like I'm a better learner now, and I wish my own children had it because even in college they're taking notes and they don't know this and this would be so much easier for them. So I think it's reaching them to be lifelong learners and thinkers which is what we want them to do, we don't want them to study for a social studies test, get a 100 and then never know what we did the next day, which is kind of like the way we went to school." [ER Lines 300-310]
1K	"So I think it's really clarified…it for a lot of students whether they're ELLs or whether they're reading at a 3rd or 4th grade level. I think thinking maps helps kind of mesh all of [the "parts of the sentence" Line 156] together." [AV Lines 163-166]
1K	"Sometimes they have things that look like a bubble map but it is not a bubble map so they have to really…look at the prompt and see what it's asking and not just throw in adjectives because that's what we're used to doing." [AC Lines 292-295]
1M	"…sometimes they even say well I didn't think about it that way, and then so it gives a sense of pride to the student who did do something different, but it also is a confirmation for the students who picked the same map and even on the same map have different ways of thinking of the information or put different words that reflect the work that they were doing." [AC Lines 28-32]
1M	"…we're going to talk about this today. What do you think we should take notes, what thinking map do you think we should use to take notes, and they're pretty good at it…" [ER Lines 23-25]
1M	"I think it is sometimes what we might say are the smaller things…even though it's not to them…getting that word or understanding…one time I said to my students…do you know what a snow storm is and…a few of the kids did not know…so I think that any time they…grab a new word or they understand a new concept, do they have a word to put with the concept…it is satisfying to them. I think that they do…consider that a success." [H&E Lines 267-274]

Code	Quotations
1M	"…the fact that any of my children last year you could pull them aside and say can you tell me about the parts of a butterfly and they could…explain each and every part and they used the words…of the life cycle because they created it, they wrote it, they learned it, they acted it out and their ability to tell you and that's the only, I mean really they put it together, but they also, you know, their words." [SM Lines 82-87]
1M	"…they fixed it, and that was without me being involved at all. When I came back, when I stopped them they were on one track and I left, and I came back and they had changed it completely and I asked them what happened and they said well we thought about it and it didn't make sense for him to have been able to do that so when we looked back at the story we tried to find evidence to put in the frame we had to change it." [AC Lines 124-129]
1M	"Without the map they wouldn't have had that opportunity before." [Line 456] ["you remember a time like that" Line 457] "I was struggling for years trying to figure out how do I get them started…my thinking was always one way and I was always teaching it my way, now they're teaching me their way. So it's really interesting how it shifted." [H&E Lines 458-468]
1M	"…what's really wonderful for children with special needs because there's not the pressure of producing an enormous amount and the thinking map allows...for achievement" [V&L Lines 236-242]
1M	"I also use some guided questions for those students. I use sentence starters for them…give them that sentence starter so that they can fill it in…and be successful." [H&E Lines 352-357]
1M	"What I think is good for the ELLs is that they know that they can also illustrate, that the spelling doesn't really matter, that they can get their thoughts on paper, and they feel a lot more confident about it because they're not constantly worrying about, well I spelt this wrong and am I saying it properly, and it's not full sentences, so they're just able to recall certain details that are important. So I think it's beneficial for them especially." [ER Lines 98-103]
1M	["…do you see that transferring to your formative assessments or your ELA assessments?" AC Lines 274-275] "…we had just done a practice run in ELA and one of the questions looks exactly like a flow map and actually it worked out that this time it was a flow map…You had to fill in the empty box and then there was one more bit of information there. So because they were familiar with the flow map they knew exactly what should go in that…empty box." [AC Lines 276-281]

Code	Quotations
1M	"…it's a way for them to organize their thinking and if they can organize their thinking and understand their thinking then they're going to achieve no matter what." [AV Lines 346-348]
1M	"…where it was so difficult before…how do I get these children to start writing…and everybody would say…have some cute sentence starter…you have story started…they're sitting there and they're staring at it and waiting. Now with these wonderful opportunities I can just say, we can have all this information first and now look at what you can pull from, and now…their creative writing books are filled." [H&E Lines 559-565]
1M	"…it's just to give each thought process a name and a concrete visual to go with it…something that kids have and hold onto and can use and refer back to…again and again, and it's not something that's different or unique depending on the question…what question is going to be asked of me. I don't know, will it be something I'm good at, will I know it…every question can go into a map and as the kids goes through the grades and become more and more comfortable, more and more flexible with their use, I think that it can only have a positive impact on achievement." [H&E Lines 577-585]
1M	"…even in 1st grade I have children who have trouble verbally telling me after they read a story for a DRA what happened, but those same children can easily do a flow map for that story." [H&E Lines 587-589]
1M	"Watching my children shine…you had to see them, they were so excited to go up there and they're stopping people to tell them everything that they know. I mean just they're confident, they want to go and speak, they're not shy…" [SM Lines 219-221]
1M	"…they know what they're talking about, they wow people. People look at you and say oh my God, this is kindergarten, and they're knowing what they're doing." [SM Lines 224-226]
1M	"…[working with TMs] makes their writing clearer. A lot of times our English language learners…are just, all of our students have a difficult time expressing themselves clearly in the writing. Even expressing themselves orally. The thinking maps, the visual of it…because it puts all their thoughts down then they have this visual and then they're able to express themselves through oral language and in writing clearer and more consistently with more support and details." [V&L Lines 221-227]
1M	"Their [ELLs] wait time is longer and I see that they think, and think, and think, and then they will say, they will share…" [H&E Lines 243-245]

Code	Quotations
1M	"I think it is sometimes what we might say are the smaller things…even though it's not to them…getting that word or understanding…one time I said to my students…do you know what a snow storm is and…a few of the kids did not know…so I think that any time they…grab a new word or they understand a new concept, do they have a word to put with the concept…it is satisfying to them. I think that they do…consider that a success." [H&E Lines 267-274]
1N	"I believe it's a great way to get students excited about writing in a fun way." [H&E Lines 7-11]
1N	"I find that the students were quite receptive in taking them in. There was a sort of excitement about it..." [V&L Lines 44-46]
1N	"…it leads to student achievement because…this is a great way to start thinking." [H&E Lines 529-550]
1N	"Before we had maps we didn't have this first step, so now we are thinking together as a group, now we're modeling more, now they're writing and their writing has become…teaching 3rd grade, so much more than I've ever seen it before." [H&E Lines 550-553]
1N	"…there are concrete visuals, so who doesn't respond to that…it's just only natural that they would know what the expectations are when they can clearly see what needs to be done and I think that the cumulative effect is great because it's a common language…before we didn't really have the step…we had it but it was so ambiguous to the kids, the planning, you'd give the kids a blank paper and be like okay, plan your writing…I mean give me a break…" [H&E Lines 567-574]
1O	"…but once it became more of a school-wide implementation and they knew the maps, it easily fostered itself into the lesson…" [V&L Lines 63-67]
1O	"A lot of times what I like to do with ELLs is we do what we used to do and we did a lot of DOL [Dimensions of Learning] in the building with the sketch to stretch, I kind of incorporate that with the thinking maps sometimes." [ER Lines 109-111]
1O	"The maps also tend to allow them to make connections from other things that they know as well so it connects the dots in their mind…" [V&L Lines 362-363]
1O	"I think it helps them to focus like I know those are the words that she expects us to use because those are the words that are on the map." [AV Lines 298-300]
1O	"…once it became more of a school-wide implementation and they knew the maps, it easily fostered itself into the lesson…" [V&L Lines 63-67]

Code	Quotations
1P	"…I let them choose [which map to use] because a lot of the times they can use multiple maps to look at the same information." [AC Lines 19-22]
1P	"I think [teaching with TMs has] made me slow down a little bit but in a good way because they're still understanding everything and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have visual, you know, you have oral cause we go over it and then they can see it so they can connect and then drawings if need be. So I just think that it's made me more able to differentiate, scaffold the instruction and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody." [AV Lines 176-183]
1P	"Without the map they wouldn't have had that opportunity before." [Line 456] ["you remember a time like that" Line 457] "I was struggling for years trying to figure out how do I get them started…my thinking was always one way and I was always teaching it my way, now they're teaching me their way. So it's really interesting how it shifted." [H&E Lines 458-468]
1P	"…the problem you don't want to have is that students lock themselves into one or two of them. You want them to kind of think outside the box…" [ER Lines 175-177]
1P	"…I think having created these types of maps really helped them to understand what a synonym is because now it's spelled out in an easier way, not telling them it's the same, you know, they're seeing it." [AV Lines 140-143]
1P	"…it's just to give each thought process a name and a concrete visual to go with it…something that kids have and hold onto and can use and refer back to…again and again, and it's not something that's different or unique depending on the question…what question is going to be asked of me. I don't know, will it be something I'm good at, will I know it…every question can go into a map and as the kids goes through the grades and become more and more comfortable, more and more flexible with their use, I think that it can only have a positive impact on achievement." [H&E Lines 577-585]
1P	"…they're asking can we add more…and that's the great part, there is no end to these maps, it's not that's it, you can put as many circles as you like, as many boxes as you like, nothing has to be perfectly…fit on one particular page, you can use two…so it's endless. It doesn't, your thinking does not have to stop on one page, whereas before we used to be like okay the page is finished, you're done." [H&E Lines 590-595]

Code	Quotations
1R	"And the fact that they've also been using this as when they were…kindergarten, 1st grade…" [AV Lines 107-108] "…that one's a hard one but they come already prepared and at least exposed to the majority of the thinking maps." [AV Lines 112-113] "…they come in already having a base..." [AV Lines 115-116]
1R	"…at times I feel like it saves you work and it certainly saves the 2nd grade teachers work when they come and they know this…it's a common language…it really does carry over from year to year." [H&E Lines 312-316]
1R	"I feel that as a building since everyone is using this now by the time I see them in 5th grade it's an excellent tool, and I think it's going to be beneficial to them going to middle school." [ER Lines 31-33]
1R	"…once it became more of a school-wide implementation and they knew the maps, it easily fostered itself into the lesson…" [V&L Lines 63-67]
1T	"…I like to sit there and try to figure out ways to use as many as I can, and some of them are difficult, especially for the younger children to use.…" [SM Lines 35-37]
1T	"…it's definitely a struggle because even for teachers…it's so much easier to use certain maps for certain subject areas…" [H&E Lines 286-287]
1T	"Now it's not usual to come up and use a brace map in a literacy lesson…" [Line 293] "…we used it for nonfiction…" [Line 297]
1T	"I would say is that some maps are a little more…a multi flow with the cause and effect. I think developmentally sometimes…we're pushing them and we're trying and the map is extremely helpful but they may not be just there yet." [V&L Lines 281-284]
1T	"…being in the ESL where we only have a limited amount of time, you didn't want to focus your instruction really on how to use the map..." [V&L Lines 63-67]
2A	"…using all eight maps, I have to really be, you know, thoughtful and creative about you know what, I haven't used a brace map and these kids really need to see that more, so where am I going to use it…" '[H&E Lines 63-66]
2A	"…Like the beginning of the school year, the first day of school I make them work with a partner or three people and I just give them the word summer and I make them come up with all eight thinking maps together." [ER Lines 86-90]
2A	"…they do have personal experiences with the maps and then gradually we move them over to using them academically." [AC Lines 159-160]

Code	Quotations
2A	"If they think back to the way they related themselves to something else then they can use that to help them use it in an academic way." [AC Lines 169-171]
2A	"I think you need to do that ["…constantly checking for understanding and monitoring their progress" Line 291] because you want to monitor their progress and also because you lose them and there are a lot of students that when they feel that they don't understand something, or maybe they're not interested in social studies or science." [ER Lines 293-296]
2B	"...you have to elicit with more specific and direct questions to those children [who take longer]." [H&E Lines 38-44]
2B	"…what happens is if I model my thinking aloud and they see that I'm thinking about it in that particular way, the map comes out automatically as part of our thinking…the conversation we have and the purposefulness of the words we choose elicit that to happen with the students." [V&L Lines 103-107]
2B	"…with my purposeful language the students get a chance to…think about the map and think in terms of that. [V&L Lines 108-113]
2B	"…it's not just enough for them to say they're the same because they both like pizza. Well how do you know, what tells you? So they're going back into the story or whatever we're doing to get proof…" [AV Lines 53-56]
2B	"The words…used are going to be big and I will tell them what they mean…" [AV Lines 138-140]
2B	"It really is just through their ability to explain…what's going on in the map…I just gave them enough experience…It really is just multiple experiences and the questioning techniques." [SM Lines 69-77]
2B	"…I'm focusing more on the language, on the language that they need to know versus the language that if they don't understand they're still going to understand what the lesson is about, so compatible and objective language, and I think that that's the main thing." [194-197]
2B	"I also use some guided questions for those students. I use sentence starters for them…give them that sentence starter so that they can fill it in…and be successful." [H&E Lines 352-357]
2B	"…we don't change to make it any less than it is." [V&L Lines 308-309]
2B	"…never changing the language and then we talk about things…you talk about a map and you use that good language when you're speaking to them and it's all there, it all gets picked up." [V&L Lines 317-319]

Code	Quotations
2B	"I do ask them questions because they would like to fill in four bubbles and be done…but they're not done and once they have those four bubbles down now you have to think, you have to go deeper. How do you know…" [AC Lines 212-214]
2B	"...one of the things that I do is I do not…dumb down the words." [AV Lines 215-218] ["So a predicate is a predicate, a subject is a subject…" Line 221] "and I will tell you what it means." [Line 222] "but you're going to know both words." [Line 224]
2B	"Obviously I'm not going to expect someone who just arrived to use the same words in English, I'll use them with them and explain what they mean just so that they get used to hearing words like that and I'll have them up on the board…" [AV Lines 228-231]
2B	"…I tried to use the key words that are up there, or a word that means something like it if I want to see if they know what an adjective is or what they would put a character trade in…I try to use words…I repeat myself a lot." [ER]
2B	"…you have to give them a lot of background knowledge before I can…try to get the words out of them." [SM Lines 150-152]
2B	"…you do have to give examples and…you've got to give them enough to sink their teeth into, so they can understand it." [SM Lines 162-164]
2B	"…when we're doing new vocabulary words and I'm a big believer in I am not going to speak to a child like they're a child." [AV]
2B	"it's…just reminding them of all those words, cause and effect… what's the reason…I put up words, clue words for cause and effect there that when we're reading we know to look at those clue words..." [ER Lines 60-65]
2B	"…you want them to learn key vocabulary so you try to see where they could put the vocabulary in the causes and effects, and what I did today was I gave them the list of vocabulary words and I said you're going to come up with as many causes and effects as you can with your partner and I want you to use as many of these words as you can. So it's just kind of telling them what language they need to know…" [ER Lines 195-200]
2B	"I do use that [academic] language with them…I use comparing and contrasting but I also say we're looking for things that are the same and things that are different…I bring it down to that level." [H&E Lines 415-417]
2B	"I'm going to define this word, we're going to find words that talk about this particular topic…so that they're seeing there's a connection." [H&E Lines 437-439]

Code	Quotations
2B	"I really don't force it. The only way that I will do it is I will keep saying…we're going to describe, or we're going to compare these two things." [SM Lines 168-169]
2B	"Sometimes with ELL students if they do a bubble map it's supposed to only be adjectives, and sometimes they write relevant words to the character that are not adjectives. So I would sit with that person and say how I like what you wrote about this person but if you're using this map, this particular map, you have to make sure that they're describing words. If you're going to write these things what other map could you use. So they can still have the same information just put it on a circle map and then it's fine. So just differentiating, using a different map versus having correct information...cause I don't want them to fee like they're wrong for saying something that is correct because it's sitting on the wrong map." [AC Lines 238-247]
2B	"I do have students that are technically ESL students, and one of the ways that I know that they've captured it is I leave them a lot for homework assignments too, so I'll say…for homework they read something about Dr. Martin Luther King, I want you to do a bubble map about him…" [AV Lines 275-278] "They're understanding that it's descriptive. Some students…don't get it and then those are the students that you need to work with a little bit more. But that's another way of helping them, and I know that leaving them a thinking map…a parent isn't going to do it because parents didn't grow up with it. So it's a purer way of assessment because I know a parent isn't sitting on the side helping them." [AV Lines 282-287] "So it really is a purer, I find a purer way of assessment." [Line 289]
2B	"Obviously I'm not going to expect someone who just arrived to use the same words in English, I'll use them with them and explain what they mean just so that they get used to hearing words like that and I'll have them up on the board…" [AV Lines 228-231]
2C	"…it's really a lot of repetition and…using them throughout the curriculum and just constantly restating…you name this map again and…getting the kids to just constantly repeat that…we're doing it again, and again, and again…" [H&E Lines 27-32]
2C	"…it also great for the kids because they're seeing it over and over again..." [SM Lines 28-31]
2C	"…going back to the 1st grade…an obstacle is just that you need to present them so many times with such frequency in order to get them to know what you're doing and to be able to name the map…and just using it again and again and just using it in many different applications and many different parts of the curriculum…" [H&E Lines 57-62]

Code	Quotations
2C	"It really is just through their ability to explain…what's going on in the map…I just gave them enough experience…It really is just multiple experiences and the questioning techniques." [SM Lines 69-77]
2C	"…I tried to use the key words that are up there, or a word that means something like it if I want to see if they know what an adjective is or what they would put a character trade in…I try to use words…I repeat myself a lot." [ER]
2C	"…you're so used to repeating yourself over and over and every different word that makes them think of a bubble map, or a tree map…" [ER Lines 174-175]
2C	"I'll have to constantly say...fall is, and we'll read a book so that...we'll get the different words...fall is bright, fall is colorful...I keep on having to say fall is..." [SM Lines 146-152]
2C	"it's…just reminding them of all those words, cause and effect… what's the reason…I put up words, clue words for cause and effect there that when we're reading we know to look at those clue words...it's just…constant conversation with them as they're doing it." [ER Lines 60-65]
2C	"…we have a big issue with vocabulary here so the repetition, the writing, the constant repetition hopefully it will stick." [ER Lines 77-78]
2C	"…we usually write it on the smart board, they have it in their notebooks and a lot of times I'll give them something to do for homework and say well go back on your notes and now I want you to write a sentence using these three words." [ER Lines 207-209]
2C	"…repeating the same words over and over, then you start saying we have to compare this and that…so really it's a lot of repetition…a lot of it…examples for them, a lot of modeling." [SM Lines 171-174]
2C	"…it's just again questioning, questions and answers…next time remember how we made the flow map describing this…we're going to do another flow map." [SM Lines 185-188]
2D	"Students are willing to jump right on board if you're excited about something." [V&L Lines 57-58]
2D	"Sometimes I'll say to them what I'm thinking to get them to make a connection." [V&L Lines 89-90]

Code	Quotations
2D	"…what happens is if I model my thinking aloud and they see that I'm thinking about it in that particular way, the map comes out automatically as part of our thinking…the conversation we have and the purposefulness of the words we choose elicit that to happen with the students." [V&L Lines 103-107]
2D	"…making sure that all the kids are participating in that discussion and even if they can't offer ideas having them practice their listening and repeating what someone else said is…I feel still a valuable way to develop their language." [H&E Lines 114-117] "…even if it's not their own, even if they cannot articulate their own thought or even if they're not sure what to do, you know, listen and then tell me what somebody else is doing." [H&E Lines 125-127]
2D	"…always demonstrating prior to any lesson." [H&E Line 137] "They'll see it visually and then when they choose to write they're more comfortable doing that and they all do share at their team, they have a partner to talk it over with first and then the writing comes after." [H&E Lines 141-144]
2D	"We build one [TM] in class so I think one of the things…" [AV Lines 96-102]
2D	"…we might discuss it as a group, but no, I want to tell them all about this character…what do you think I'll use." [H&E Lines 486-487] "…and you'll get some crazy answers too…" [Line 489]
2D	"Well a lot of times we will use groups, either big groups or smaller groups…they can bounce ideas off of each other and that usually helps to pull it into a bigger idea. And also again, the questioning on how did you get that and what can we use for that and how can we make it better, and what do you think." [SM Lines 120-124]
2D	"…never changing the language and then we talk about things…you talk about a map and you use that good language when you're speaking to them and it's all there, it all gets picked up." [V&L Lines 317-319]
2D	"…we have a big issue with vocabulary here so the repetition, the writing, the constant repetition hopefully it will stick." [ER Lines 77-78] ["But the question I have for you, is it sticking then?" Line 79] "I think that it is cause I have students repeating to me that language without me constantly saying, well I know that it's cause and effect because it says the reason that, so they will repeat it." [ER Lines 80-82]

Code	Quotations
2D	"…repeating the same words over and over, then you start saying we have to compare this and that…so really it's a lot of repetition…a lot of it…examples for them, a lot of modeling." [SM Lines 171-174]
2D	"Before we had maps we didn't have this first step, so now we are thinking together as a group, now we're modeling more, now they're writing and their writing has become…teaching 3rd grade, so much more than I've ever seen it before." [H&E Lines 550-553]
2E	"…they're…and discussing it, why are we doing this…" [H&E Lines 27-32]
2E	"…we make a huge letter book with just coming up with the letters and the pictures that go with them with the sounds." [SM Lines 28-31]
2E	"…it's almost part of our thinking...our thinking aloud about it...try and develop an understanding together." [V&L Lines 87-89]
2E	"…it's these kinds of conversations that are happening…in which the teaching and the language and then even with talking about not just the vocabulary but why it's happening and when going into the cause and the effects and more of the inferential type of thinking processes." [V&L Lines 93-96]
2E	"…what happens is if I model my thinking aloud and they see that I'm thinking about it in that particular way, the map comes out automatically as part of our thinking…the conversation we have and the purposefulness of the words we choose elicit that to happen with the students." [V&L Lines 103-107]
2E	"…sometimes they even say well I didn't think about it that way, and then so it gives a sense of pride to the student who did do something different, but it also is a confirmation for the students who picked the same map and even on the same map have different ways of thinking of the information or put different words that reflect the work that they were doing." [AC Lines 28-32]
2E	"...if they're working with a partner they do think aloud because they have to come to a consensus on what should be included on their map." [AC Lines 35-40]
2E	"When they're working with a partner I can see and hear exactly how they're thinking about the material. I can't, I don't hear it when they're working individually." [AC Lines 43-45]
2E	"And it's nice when they are bouncing ideas off each other how they convince their partner, or how they become convinced of another way of thinking." [AC Lines 47-48]

Code	Quotations
2E	"...when we're going to use a thinking map as a class we usually do mostly as a class…" [AV Lines 42-43]
2E	"…I kind of start off…trying to elicit the idea." [Line 45]
2E	"…we're going to talk about this today. What do you think we should take notes, what thinking map do you think we should use to take notes, and they're pretty good at it…" [ER Lines 23-25]
2E	"...just reminding them of all those words, cause and effect...well what's the reason, like I put up words, clue words for cause and effect there that when we're reading we know to look at those clue words...something goes off in their brain they say...cause and effect...when they see those words. So it's just...constant conversation with them as they're doing it." [ER Lines 60-65]
2E	"…we do a lot of think, pair, share, turn and talk with your partner, and when they're working, you know, 1st graders are always in conversation even when it's a quiet work time." [H&E Lines 106-108]
2E	"…making sure that all the kids are participating in that discussion and even if they can't offer ideas having them practice their listening and repeating what someone else said is…I feel still a valuable way to develop their language." [H&E Lines 114-117] "…even if it's not their own, even if they cannot articulate their own thought or even if they're not sure what to do, you know, listen and then tell me what somebody else is doing." [H&E Lines 125-127]
2E	"…always demonstrating prior to any lesson." [H&E Line 137] "They'll see it visually and then when they choose to write they're more comfortable doing that and they all do share at their team, they have a partner to talk it over with first and then the writing comes after." [H&E Lines 141-144]
2E	"…two girls will turn to each other and maybe say it in Spanish and then try and get the English word out or they'll get a picture out or something." [V&L Lines 144-146]
2E	"…I'll call on the children that I know are ELL's, I'll call on the IEP's cause I know kids that are going to know what it is, I don't want to hear from them. I want to hear from the ones that don't and they'll be able to tell me, oh, we're going to do this and that." [AV Lines 79-82]
2E	"…I make them work with a partner or three people and I just give them the word summer and I make them come up with all eight thinking maps together." [ER Lines 86-90]

Code	Quotations
2E	"…the stronger children do tend to take over, but that happens normally anyway, so it really just works in their benefit." [H&E Lines 181-182]
2E	"…my ESL students…work so well with everybody else that there no separation between them..." [AC Lines 95-99]
2E	"…A kid asks just for some of our newcomers, just give me one word, one word...and then let's together work on filling out the rest, but that made that one child feel successful because they were able to contribute one piece." [V&L Lines 273-276]
2E	"…so my goal is to try to get them to be the conversationalist and not me, because I feel like if I tell them they're wrong they're not going to feel confident." [ER Lines 239-241]
2E	"…definitely the conversation……it is important and it's definitely one of my probably most used strategies would be the turn and talk and think pair share…talk it over with your group…" [H&E Lines 349-352]
2E	"…we might discuss it as a group, but no, I want to tell them all about this character…what do you think I'll use." [H&E Lines 486-487] "…and you'll get some crazy answers too…" [Line 489]
2E	"Well a lot of times we will use groups, either big groups or smaller groups…they can bounce ideas off of each other and that usually helps to pull it into a bigger idea. And also again, the questioning on how did you get that and what can we use for that and how can we make it better, and what do you think." [SM Lines 120-124]
2E	"...the questioning on how did you get that and what can we use for that and how can we make it better, and what do you think." [SM Lines 122-124]
2E	"…never changing the language and then we talk about things…you talk about a map and you use that good language when you're speaking to them and it's all there, it all gets picked up." [V&L Lines 317-319]
2E	"…vocabulary building, those kinds of things, they all do them together…and it's a good system." [AC Lines 103-104]
2E	"...it's just…constant conversation with them as they're doing it." [ER Lines 60-65]
2E	"I'm going to define this word, we're going to find words that talk about this particular topic…so that they're seeing there's a connection." [H&E Lines 437-439]

Code	Quotations
2E	"…a lot of times I have them present their thinking map…explain why they used the thinking map, what they were thinking, and anything else that might come out of there. It's kind of like a teachable moment, you don't know what's going to happen." [ER]
2E	["…let's say you notice some of the vocabulary that…the way they interpreted the map was not just right, how do you interject there? What do you say? What do you do?" ER Lines 233-235] "I kind of discuss it with a group of them…and a lot of times kids will change it for them." [ER Lines 236-238]
2E	"How can we use the flow map to talk about the book and...they'll say...because it tells us...how things go through...so what happens first in the book. So by using it in another...using it in another way or just by having the students explain what they did in their thinking and how else can we use it…" [SM Lines 189-193]
2E	"…when we're discussing a map, we'll take a few pieces off their map. I say highlight a couple of ones that you would like to discuss or even to write about, and then again bringing it into greater detail and greater depth. Now let's talk about that piece or lets have a conversation, or even draw those pieces out." [V&L Lines 397-401]
2E	"I think you need to do that ["…constantly checking for understanding and monitoring their progress" Line 291] because you want to monitor their progress and also because you lose them and there are a lot of students that when they feel that they don't understand something, or maybe they're not interested in social studies or science." [ER Lines 293-296]
2E	"…when you assign the roles you can assign a role to a student who is an ELL student that's usually maybe not as involved in the writing process but more in the encouraging. So that makes a child feel part of the team…" [H&E Lines 154-157]
2F	"I'm acting like I have no clue what I'm going to do, and so then they start giving me well we're going to do a double bubble map." [AV Lines 49-50]
2F	["Okay, so you want to put them like in a teacher role it sounds like." Line 64] "Exactly. Right, and then they feel more like oh well we can do this and we need, and I say yeah, but how do you know?...I really act like I am the student and they're the ones guiding me." [AV Lines 65-67] "…I think it helps them to come up with more ideas and really think about…what it is they have to do and why…" [AV Lines 73-74]

Code	Quotations
2I	"…they all choose different color pencils, so when they're writing their responses on the maps…" [H&E Lines 158-159] "…the children who are maybe just learning a new language might have fewer items that they've written and so I'll be able to see how much they've been able to, just by looking around at the color, not having to say well how did you do and how much did you share. So it's almost like they don't even notice oh she only put one down and I put three down, it not even, it doesn't become that it just looks like a beautiful map of colors and everybody has their own opportunity to share." [H&E Lines 162-168]
2I	[On special needs—"learning issues"]: "I think an important thing to do is to have children work together. So a lot of times if I have a special needs student or someone who has difficulty putting things on paper, I do have a particular student like that, him working with someone else getting into the thinking maps, he feels productive even if he's the one that's drawing the actual map and then once the other student starts writing you could see him contributing. He feels more confident than if he has to hand in a piece of paper by himself…" [ER Lines 148-154]
2I	"…so my goal is to try to get them to be the conversationalist and not me, because I feel like if I tell them they're wrong they're not going to feel confident." [ER Lines 239-241]
2I	"I think it's important for kids to discover on their own and…with your guidance because especially with ELLs they tend to lack confidence in anything that has to do with language, so you don't want to bring that down at any point because especially once you've gotten them to a point where you feel like they're a little more confident you don't want to bring it down because then they'll just, they'll shut down." [ER Lines 248-253]
2I	"Everyone makes mistakes, we all learn…that's…got to be the environment and that's probably the only way the thinking maps will work when they feel like that sense of equality with everyone." [ER Lines 259-262]
2I	["…how do you manage the crazy answers?" Line 490] "…of course you're going to steer your conversation towards the appropriate responses…there's a variety of ways that we do that with the little guys 'cause you don't want any tears or anything or damaged egos."

Code	Quotations
2I	"Sometimes with ELL students if they do a bubble map it's supposed to only be adjectives, and sometimes they write relevant words to the character that are not adjectives. So I would sit with that person and say how I like what you wrote about this person but if you're using this map, this particular map, you have to make sure that they're describing words. If you're going to write these things what other map could you use. So they can still have the same information just put it on a circle map and then it's fine. So just differentiating, using a different map versus having correct information, you know, cause I don't want them to fee like they're wrong for saying something that is correct because it's sitting on the wrong map." [AC Lines 238-247]
2I	"…you want them to really…just understand and grow with it instead of feeling…negative about themselves. So…I let them express their answers in different ways…" [ER Lines 288-290]
3A	"…by the way that they use them when you see their finished work, you can see if they understand what each of the maps is for. Like the beginning of the school year, the first day of school I make them work with a partner or three people and I just give them the word summer and I make them come up with all eight thinking maps together." [ER Lines 86-90] "So then I get an idea of where I need to begin." [Line 92]
3A	"…you can really just looking at the maps themselves is evidence that whether or not they understand what to do with that flow map." [H&E Lines 193-194]
3A	"…if I gave them the words they could sort them into where they belong on the map and…it would show me that they understand the material without having to come up with those words themselves…" [AC Lines 72-75]
3A	"…if they use pictures which they really don't have to do anymore, but if they use the pictures and they put them in the correct space on a bubble map…to show what the character felt like or to describe…how the character was, then I know that they understand the character....varying it as simply as giving them the words and having them show where they belong it shows me what they understand." [AC Lines 81-87]
3A	"…if they're not using the proper words in that bubble map then I'm seeing that they're not understanding the language that I need them to know, and so then I'll review." [H&E Lines 203-209]
3A	"…I feel that when I see what a child is doing that's my way of being able to judge if they're getting the language." [H&E Lines 213-214]

Code	Quotations
3A	"I do have students that are technically ESL students, and one of the ways that I know that they've captured it is I leave them a lot for homework assignments too, so I'll say…for homework they read something about Dr. Martin Luther King, I want you to do a bubble map about him…" [AV Lines 275-278] "They're understanding that it's descriptive. Some students…don't get it and then those are the students that you need to work with a little bit more. But that's another way of helping them, and I know that leaving them a thinking map…a parent isn't going to do it because parents didn't grow up with it. So it's a purer way of assessment because I know a parent isn't sitting on the side helping them." [AV Lines 282-287] "So it really is a purer, I find a purer way of assessment." [Line 289]
3A	"I'll say…we just finished studying our native Americans, I want you to come up with all eight thinking maps and give me whatever information you have, and that's how you can really see it." [ER Lines 95-98]
3A	"Some of them…if they're drawing pictures and labeling them I'll know that they understood." [ER Lines 283-284]
3A	"…the maps can be the assessment…" [Line 532]
3B	"I think that using these maps make it easier for the children to be able to write down what they're thinking." [H&E Lines 7-11]
3B	"Some of the children really think aloud and you can hear them…they put their hand up and they know right away what they'd like to add..." [H&E Lines 38-44]
3B	"I'll always ask them, so why do you know you have to do this, and they, as long as they know, they can tell me why they know they have to do this then I think that they're understanding and as they're reading they're doing it." [ER Lines 47-50]
3B	"…yesterday I said...how will we do setting if you wanted summarized setting for me with a thinking map, so one students said well, I could do a circle map and just write down all the things that happen in different places and times. So then somebody else said well you know what, we could do a tree map, and it could say setting and it could say time and place." [ER Lines 50-54] "So that shows me that they're thinking and they're thinking in that context." [ER Line 58]
3B	"From their conversations." [Line 119]
3B	"From their work." [V&L Lines 121]
3B	"The way they're talking about things, the way they're drawing…" [Line 123]

Code	Quotations
3B	"…they're using the conjunctive words that connect the beginning and the end and they're…explaining it to someone else; they're showing that they understand." [AC Lines 63-65]
3B	"...I call on them [ELL students] specifically to tell me what map can we use and why, and why can we use those." [AV Lines 96-102]
3B	"...I have student work." [AV Line 123] "...it also shows me that he's understanding the language…" [AV Line 131]
3B	"It really is just through their ability to explain…what's going on in the map…I just gave them enough experience…It really is just multiple experiences and the questioning techniques." [SM Lines 69-77]
3B	"And their being able to describe what they did." [SM? Line 79]
3B	"…within a small group setting it's a lot of thinking it aloud, thinking it through, and one person will start and you'll hear someone…and you know they're thinking about it but they don't have the language to express it and then someone else trying to interrupt or all chime in and then the conversation continues…" [V&L Lines 191-195]
3B	"…accountability…" [Line 201]
3B	"Their [ELLs] wait time is longer and I see that they think, and think, and think, and then they will say, they will share…" [H&E Lines 243-245]
3B	"…the fact that any of my children last year you could pull them aside and say can you tell me about the parts of a butterfly and they could…explain each and every part and they used the words…of the life cycle because they created it, they wrote it, they learned it, they acted it out and their ability to tell you and that's the only, I mean really they put it together, but they also, you know, their words." [SM Lines 82-87]
3B	"…they'll echo back to me…" [Line 447]
3B	"…a lot of times through conversation, sometimes through writing, depending on their level, but once they've succeed with the thinking map a lot of times we'll bring it back into the writing then." [V&L Lines 377-379]
3B	"…they go back, they look for the evidence and they put it in the frame and it actually makes a world of difference and then they can present it to the class and people get a chance to ask questions and the person who has done the map or the work will explain where they came up with their ideas or how they thought about it." [AC Lines 228-232]

Code	Quotations
3B	"…I ask them…how did you get to this and why." [AV Line 308] "…it's a lot of how did you get to this, how do you know…" [AV Line 318]
3B	"…a lot of times I have them present their thinking map…explain why they used the thinking map, what they were thinking, and anything else that might come out of there. It's kind of like a teachable moment, you don't know what's going to happen." [ER]
3B	"…you could be talking to a student for a few minutes and then they'll come and say well I could have also done this, and I could have done that. So that's what you want from them, they might not have done it right there but the fact that they know that they can keep going and going and going with it cause then the next time you'll see them doing the next step…" [ER Lines 227-231]
3B	"I love to ask them what they're thinking and why they chose to put what they placed down. I want to hear in their own words, I want to almost hear them tell me in sentences what their maps are. I don't want to just hear of the five adjectives." [H&E Lines 500-503]
3B	"…have them cite some evidence or go a little bit deeper…" [H&E Lines 518-519]
3B	"…when we're discussing a map, we'll take a few pieces off their map. I say highlight a couple of ones that you would like to discuss or even to write about, and then again bringing it into greater detail and greater depth. Now let's talk about that piece or lets have a conversation, or even draw those pieces out." [V&L Lines 397-401]
3B	"…I just look at what they're doing and ask them, well how do you know what's going on…or what makes you put this down...So I think that's a way of really…assessing did they understand…did they know what the vocabulary, or are they just copying words that they saw in the book down…" [AV Lines 326-331]
3B	"…I like to use the thinking maps a lot for writing…to give them that reference so that they can recall the words and use them in a meaningful way…I think they know what's expected of them at this point." [H&E Lines 523-528]
3B	"…working to see how they did it, but mostly for me the ELL students are to listen to them." [SM Lines 199-200]
3B	"To listen to see whether or not I hear those vocabulary words. To listen to see whether or not the learning is coming through. It really is just a lot of conferencing and a lot of…one-on-one." [SM Lines 202-204]

Code	Quotations
3B	"And you're going to see it…through their writing skills…that's the assessment piece because they're acquiring I think even quicker language, academic language and then you're going to see it through their writing, you're going to see it through their explanations, you're going to see it through their connectedness and their discussion of the maps." [V&L Lines 417-422]
3B	"…you're going to see it especially in the writing, it makes it clearer, it makes it richer, it makes it easier to understand…" [V&L Lines 430-431]
3B	"…in the writing I think sometimes in their minds they're thinking about it but it is not in a clear concise way. Their thinking is all over the place so their writing comes out all over the place, you get beginning, middle, details, a whole jumbled mess, but the thinking maps makes it clear for them to write in a sequential matter that makes sense, that's adding details, it's putting in vocabulary that makes it clear." [V&L Lines 432-437]
3C	"...if they're working with a partner they do think aloud because they have to come to a consensus on what should be included on their map. If they're working individually they're not, they don't do so much of the thinking out loud, you can see it on the page, but it's pretty quiet as they're reflecting on what they're reading and thinking about how they can represent what they think about it, like thinking a million times." [AC Lines 35-40]
3C	["…analysis of student work matters because…" Line 158] "…we're seeing their thought process, we're seeing their thinking…" [Line 159]
3C	"We need to understand what the student and child understands…" [Line 167]
3C	"…it's not just seeing do you understand the story, which it absolutely is an important piece…you want to see their comprehension, but you can also see…there's the map…I think if they've completed it successfully then you can say that they understand what the flow map is for." [H&E Lines 196-200]
3C	"They might not be able to express it completely, but what happens is…the thought processes are there and you can literally see them trying to stretch and reach and go." [V&L Lines 180-182]
3C	"Their [ELLs] wait time is longer and I see that they think, and think, and think, and then they will say, they will share…" [H&E Lines 243-245]
3C	"But it shows that they have an understanding of the content, it's just written on the wrong map." [Line 256]

Code	Quotations
3D	"…they all choose different color pencils, so when they're writing their responses on the maps…" [H&E Lines 158-159] "…the children who are maybe just learning a new language might have fewer items that they've written and so I'll be able to see how much they've been able to, just by looking around at the color, not having to say well how did you do and how much did you share. So it's almost like they don't even notice oh she only put one down and I put three down, it not even, it doesn't become that it just looks like a beautiful map of colors and everybody has their own opportunity to share." [H&E Lines 162-168]
3D	"I think [teaching with TMs has] made me slow down a little bit but in a good way because they're still understanding everything and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have visual, you know, you have oral cause we go over it and then they can see it so they can connect and then drawings if need be. So I just think that it's made me more able to differentiate, scaffold the instruction and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody." [AV Lines 176-183]
4A	"There was some video tape…I think it was actually…the news that took video of our kids that went up there and was speaking with our children and having little 5 year olds this big you know telling you everything that they learned and it's amazing." [SM Lines 228-231]
4A	"But once you get past that I think that they're realizing that okay it doesn't really matter how it looks it's what we're saying and looking at what we're getting from it. And I think that's where they are now in March actually, so that's good." [H&E Lines 93-96] "So they'll be prepared for 4th grade and they won't have to worry so much and that's why I think it's a great transitional year and they'll get a lot out of it." [H&E Lines 98-99]
4A	"…sometimes they even say well I didn't think about it that way, and then so it gives a sense of pride to the student who did do something different, but it also is a confirmation for the students who picked the same map and even on the same map have different ways of thinking of the information or put different words that reflect the work that they were doing." [AC Lines 28-32]
4A	["So they're just not like there saying oh my God I don't know anything. You don't get that feeling from them." H&E Lines 247-248] "No they're not in a panic they're really thinking, I almost see like the wheels turning in their brains and…at times depending on what the topic is and what I'm asking them they will look around to find, you know, some kind of reference." [H&E Lines 249-252]

Code	Quotations
4A	"…they enjoy being successful so when they do find that word whether it's to say it to you or to write it in a sentence, I do think that they find their efforts satisfying." [261-263]
4A	"…what's really wonderful for children with special needs because there's not the pressure of producing an enormous amount and the thinking map allows you to express what you have inside of you, what you can offer…even if they're working with someone and they can offer maybe two pieces it's there...it's not this pressure of I have to produce so much…you're decreasing frustration..." [V&L Lines 236-242]
4A	"…A kid asks just for some of our newcomers, just give me one word, one word, you know, and then let's together work on filling out the rest, but that made that one child feel successful because they were able to contribute one piece." [V&L Lines 273-276]
4A	"…there's no frustration…they're so comfortable…[with TMs]." [V&L Lines 286-289]
4A	"…when a child comes in and we've talked about maybe describing a planet and then going out on their own…it's truly that magnificent feeling that they felt so successful that they wanted to go on and acquire more." [V&L Lines 325-329]
4A	"…they feel more comfortable with it and then…highlight their vocabulary words that they're using as they go along and those they'll be able to copy. So they always feel confident that they have those right." [ER Lines 273-275]
4A	"…when they're going to grapple with the passage from ELA…there's a way to think about it and so that it's not frightening, it's not threatening and they can…synthesize all the information they have, allow it to make sense to them and then…answer questions or…comprehend the information." [V&L Lines 425-429]
4A	"…it's just a more comfortable feeling for them, they know what's supposed to be on the map and they can pick apart even more challenging work to put into the map because they know what belongs there. So I think it takes away some of the fear of just being out there on their own with new information. It makes it a little more familiar even if it's not." [AC Lines 265-269]

Code	Quotations
4A	"…it's just to give each thought process a name and a concrete visual to go with it…something that kids have and hold onto and can use and refer back to…again and again, and it's not something that's different or unique depending on the question…what question is going to be asked of me. I don't know, will it be something I'm good at, will I know it…every question can go into a map and as the kids goes through the grades and become more and more comfortable, more and more flexible with their use, I think that it can only have a positive impact on achievement." [H&E Lines 577-585]
4A	"Watching my children shine…you had to see them, they were so excited to go up there and they're stopping people to tell them everything that they know. I mean just they're confident, they want to go and speak, they're not shy…" [SM Lines 219-221]
4A	"…they know what they're talking about, they wow people. People look at you and say oh my God, this is kindergarten, and they're knowing what they're doing." [SM Lines 224-226]
4A	"...they can get their thoughts on paper, and they feel a lot more confident about it because they're not constantly worrying about, well I spelt this wrong and am I saying it properly, and it's not full sentences." [ER Lines 98-103]
4B	"They might not be able to express it completely, but what happens is…the thought processes are there and you can literally see them trying to stretch and reach and go." [V&L Lines 180-182]
4B	"…they're asking can we add more…and that's the great part, there is no end to these maps, it's not that's it, you can put as many circles as you like, as many boxes as you like, nothing has to be perfectly…fit on one particular page, you can use two…so it's endless. It doesn't, your thinking does not have to stop on one page, whereas before we used to be like okay the page is finished, you're done." [H&E Lines 590-595]
4C	"...at times depending on what the topic is and what I'm asking them they will look around to find...some kind of reference." [H&E Lines 249-252]
4C	"…using the map gives them a guideline to finding information…" [AC Lines 201-202]
4D	"…it's that whole frame of reference of their understanding…almost ingrained…it's built upon year after year…" [V&L Lines 125-127]

Code	Quotations
4D	"…you could be talking to a student for a few minutes and then they'll come and say well I could have also done this, and I could have done that. So that's what you want from them, they might not have done it right there but the fact that they know that they can keep going and going and going with it cause then the next time you'll see them doing the next step…" [ER Lines 227-231]
4E	"I think the next step for us is to get them to do it on their own independently…" [V&L Lines 130-131]
4E	"…we studied antonyms and…they built their own bridge maps and they were able to do it, they were able to say…oh antonyms means they're the opposite…" [AV?]
4E	"the ELL students...build their own maps. So it tells me that…they are getting, they are understanding what they need to do." [AV Lines 96-102]
4E	"...he's one of the kids that he's reading at a kindergarten level and that's what he's pulling...we give him a book and you have to give him like a D/E level and he was able to do this by himself." [AV Lines 127-129]
4E	"…I can step back, be an observer, sort of walk around and I've passed the torch to them." [V&L Lines 207-208]
4E	"…they fixed it, and that was without me being involved at all. When I came back, when I stopped them they were on one track and I left, and I came back and they had changed it completely and I asked them what happened and they said well we thought about it and it didn't make sense for him to have been able to do that so when we looked back at the story we tried to find evidence to put in the frame we had to change it." [AC Lines 124-129]
4E	"…like yesterday for example we were doing the parts of a fiction story, that was studying like test prep for fiction and they're writing with character plot and setting, so we talked about if they had to just do a summary of a book what thinking map would they use for each part of that, and they were able to come up with it on their own." [ER Lines 25-29]
4E	"…when a child comes in and we've talked about maybe describing a planet and then going out on their own…it's truly that magnificent feeling that they felt so successful that they wanted to go on and acquire more." [V&L Lines 325-329]
4E	"…they know exactly what they're looking for and they have a clear understanding of what is expected on that map and how they can get that information." [AC Lines 206-208]

Code	Quotations
4E	"…as the complexity of the tasks increases as you go through the grades, there's more opportunity for the student to choose their map and think critically about a task." [H&E Lines 470-472]
4E	"I do have students that are technically ESL students, and one of the ways that I know that they've captured it is I leave them a lot for homework assignments too, so I'll say…for homework they read something about Dr. Martin Luther King, I want you to do a bubble map about him…" [AV Lines 275-278] "They're understanding that it's descriptive. Some students…don't get it and then those are the students that you need to work with a little bit more. But that's another way of helping them, and I know that leaving them a thinking map…a parent isn't going to do it because parents didn't grow up with it. So it's a purer way of assessment because I know a parent isn't sitting on the side helping them." [AV Lines 282-287] "So it really is a purer, I find a purer way of assessment." [Line 289]
4F	"…it's evident or it's evidenced that they think of the map and then they search through their bank of knowledge and their bank of language to connect with it immediately…" [V&L Lines 146-148]
4F	"…also the acquisition of new language, what new words can I acquire that go with this as well and hanging onto it." [V&L Lines 150-151]
4F	"So I use them for…lots of language acquisition and content vocabulary." [V&L Lines 19-21]
4F	"…they can internalize the vocabulary..." [H&E Lines 27-32]
4F	"…it's these kinds of conversations that are happening…in which the teaching and the language and then even with talking about not just the vocabulary but why it's happening..." [V&L Lines 93-96]
4F	"I know I'm comparing let's say two characters, well what then, and then they start bringing up like oh okay, well how are they the same…" [AV Lines 51-52]
4F	"...just reminding them of all those words, cause and effect...well what's the reason, like I put up words, clue words for cause and effect there that when we're reading we know to look at those clue words...something goes off in their brain they say...cause and effect...when they see those words. So it's just...constant conversation with them as they're doing it." [ER Lines 60-65]
4F	"…they're using the conjunctive words that connect the beginning and the end and they're…explaining it to someone else; they're showing that they understand." [AC Lines 63-65]

Code	Quotations
4F	"…we studied antonyms and…they built their own bridge maps and they were able to do it, they were able to say…oh antonyms means they're the opposite…" [AV?]
4F	"I was [impressed] because it also shows me that he's understanding the language…" [AV Line 131]
4F	"...it's gotten to a point where even my ELL's are going, such and such word is a synonym 'cause it's…" [AV Lines 138-140]
4F	"…if they use pictures which they really don't have to do anymore, but if they use the pictures and they put them in the correct space on a bubble map…to show what the character felt like or to describe…how the character was, then I know that they understand the character....varying it as simply as giving them the words and having them show where they belong it shows me what they understand." [AC Lines 81-87]
4F	"…we did a tree map on nouns and verbs." [AV Lines 146-147] "It helps them understand that these two, they're part of the English language but they mean different things, and they do different things and they explain different things. So it helps English language learners really kind of start thinking of oh so I can't say ran cheap or you know, it helps them with the structure." [AV Lines 149-152] "…with I guess the syntax and things like that…" [Line 154]
4F	"…the fact that any of my children last year you could pull them aside and say can you tell me about the parts of a butterfly and they could…explain each and every part and they used the words…of the life cycle because they created it, they wrote it, they learned it, they acted it out and their ability to tell you and that's the only, I mean really they put it together, but they also...their words." [SM Lines 82-87]
4F	"…I'm focusing more on the language, on the language that they need to know versus the language that if they don't understand they're still going to understand what the lesson is about, so compatible and objective language, and I think that that's the main thing." [194-197]
4F	"I had a parent who came and told me…that her daughter's language just blossomed last year…this year her vocabulary is richer…one of the things that I do is I do not…dumb down the words." [AV Lines 215-218]
4F	"But my ultimate goal really isn't to have them use disenfranchisement and all this stuff, it's for them to get used to hearing bigger words and understanding what they mean." [247-249]
4F	"...something goes off in their brain they say…cause and effect because you know the reason for so when they see those words..." [ER Lines 60-65]

Code	Quotations
4F	"…when we're studying cause and effect…" [ER Lines 69-70] "…I've used test questions to show them that and stories, and every time we read a sentence I'll say…does anybody know if that's a cause and effect, and they'll say yes it is because it has this word in it." [ER Lines 72-74]
4F	"…we have a big issue with vocabulary here so the repetition, the writing, the constant repetition hopefully it will stick." [ER Lines 77-78] ["But the question I have for you, is it sticking then?" Line 79] "I think that it is cause I have students repeating to me that language without me constantly saying, well I know that it's cause and effect because it says the reason that, so they will repeat it." [ER Lines 80-82]
4F	"They know cause and effect is multiflow, they know classifying is a tree map, so they already know those words, even though those are words that 3rd graders might not have known before." [H&E Lines 402-404]
4F	"…they feel more comfortable with it and then…highlight their vocabulary words that they're using as they go along and those they'll be able to copy. So they always feel confident that they have those right." [ER Lines 273-275]
4F	"And you're going to see it…through their writing skills…that's the assessment piece because they're acquiring I think even quicker language, academic language and then you're going to see it through their writing, you're going to see it through their explanations, you're going to see it through their connectedness and their discussion of the maps." [V&L Lines 417-422]
4F	"Before we had maps we didn't have this first step, so now we are thinking together as a group, now we're modeling more, now they're writing and their writing has become…teaching 3rd grade, so much more than I've ever seen it before." [H&E Lines 550-553]
4F	"…[working with TMs] makes their writing clearer. A lot of times our English language learners…are just, all of our students have a difficult time expressing themselves clearly in the writing. Even expressing themselves orally. The thinking maps, the visual of it…because it puts all their thoughts down then they have this visual and then they're able to express themselves through oral language and in writing clearer and more consistently with more support and details." [V&L Lines 221-227]

Code	Quotations
4F	"…we did a tree map on nouns and verbs." [AV Lines 146-147] "It helps them understand that these two, they're part of the English language but they mean different things, and they do different things and they explain different things. So it helps English language learners really kind of start thinking of oh so I can't say ran cheap or you know, it helps them with the structure." [AV Lines 149-152] "…with I guess the syntax and things like that…" [Line 154]
4F	"...they know that they can also illustrate, that the spelling doesn't really matter, that they can get their thoughts on paper...so they're...able to recall certain details that are important." [ER Lines 98-103]
6A	"…in the beginning of the implementation I think I had to refocus my own thinking, my own teaching, and we really start thinking about what am I really asking them to do because that kind of almost defined what I wanted to use…" [V&L Lines 33-36]
6A	"…something that came up, it was to reorganize my thinking because I had to change my thinking about thinking maps, and making sure, and connecting with them, but it was really fairly instantaneous…" [V&L Lines 23-25]
6A	"…the hardest thing for me was thinking of the maps to correlate them with the instruction with what I was going to teach…even though I had had the training, the two day training or the full day training with Larry…" [AV Lines 19-22]
6A	"I was like well what map do I use and oh I'm not comfortable using the bridge map so I'm not going to use the bridge map, like it was really a big deal, it was hard, it was a new way of thinking for me." [AV Lines 23-25]
6A	"…that was really the hardest part doing that, just getting started and applying it to what I wanted to teach." [AV Lines 25-27]
6A	"Now what I need to work on more is the next step after they've built the thinking map...getting them to do it into writing, to show the writing...that right now is my semi obstacle...good we've built the maps, we know what to use the maps for but now what's the point of them...deconstructing and constructing again." [AV Lines 31-37]
6A	"…the bridge map and the multi flow map because I think I had to…learn it myself and…think of situations that I would use it before I would really expect the students to know it off hand what they could use it for and that's kind of why the training when we go back and have meetings together with teachers sharing ideas and what Larry, you all of a sudden go oh yeah a light bulb goes off and yeah I could have used it in that lesson, I could have used it in that lesson…" [ER Lines 10-16]

Code	Quotations
6A	"…using all eight maps, I have to really be, you know, thoughtful and creative about you know what, I haven't used a brace map and these kids really need to see that more, so where am I going to use it…" '[H&E Lines 63-66]
6A	"…that's another obstacle for me that I try to just actually set aside time to think about when I'm planning...what maps haven't I used…" [H&E Lines 69-71]
6A	"…what is it that maybe we might be overlooking or needing to address…" [V&L Lines 163-164]
6A	"…it all worked really well in just organizing their thinking and my thinking." [V&L Lines 30-31]
6A	"I think [teaching with TMs has] made me slow down a little bit but in a good way because they're still understanding everything and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have visual, you know, you have oral cause we go over it and then they can see it so they can connect and then drawings if need be. So I just think that it's made me more able to differentiate, scaffold the instruction and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody." [AV Lines 176-183]
6A	"since I've started using thinking maps I teach differently." [Line 128]
6A	"…it's definitely a struggle because even for teachers…it's so much easier to use certain maps for certain subject areas…" [H&E Lines 286-287]
6B	"I've had a very positive experience...and I find them all very useful, so it's been a very positive experience all around." [H&E Lines 7-11]
6B	"I feel that as a building since everyone is using this now by the time I see them in 5th grade it's an excellent tool, and I think it's going to be beneficial to them going to middle school." [ER Lines 31-33]

Code	Quotations
6B	"I think that it's going to influence them for a long time because what we're teaching them is not just the rote of school work but how to think forever so that when they read something they're going to be able to know what it is that they're reading, are they comparing something, are they describing something and it gets to be so important and I can see that looking at my own children, looking at me I wish I had this when I was in school cause I feel like I'm a better learner now, and I wish my own children had it because even in college they're taking notes and they don't know this and this would be so much easier for them. So I think it's reaching them to be lifelong learners and thinkers which is what we want them to do, we don't want them to study for a social studies test, get a 100 and then never know what we did the next day, which is kind of like the way we went to school." [ER Lines 300-310]
6C	"…there's like two parts, not only using it with the children but there's also the part that I use to help me construct the units because I'll use the maps when I'm putting together units, saying okay, how can I pull them all in and how can I make the unit work with the thinking maps, and so it helps me to plan when I'm teaching a unit." [SM Lines 19-23]
6C	"I think [teaching with TMs has] made me slow down a little bit but in a good way because they're still understanding everything and I'm getting through what I need to…I feel I can really hit the different styles of learning, you have visual, you know, you have oral cause we go over it and then they can see it so they can connect and then drawings if need be. So I just think that it's made me more able to differentiate, scaffold the instruction and make sure that everyone gets reached, so I'm not focused on just reaching the kids that are on the lower end but I can reach everybody." [AV Lines 176-183]
6C	"…[the brace map in a lesson on geometric shapes] was a great breakdown because [the subject matter] was...very hard...to visualize...but to break it down like that was very helpful." [H&E Lines 290-293]
6C	"I agree that it takes time but I think that the time is ultimately extremely well spent because ultimately you don't need to take as much time." [H&E Lines 305-306]
6C	"Without the map they wouldn't have had that opportunity before." [Line 456] ["you remember a time like that" Line 457] "I was struggling for years trying to figure out how do I get them started…my thinking was always one way and I was always teaching it my way, now they're teaching me their way. So it's really interesting how it shifted." [H&E Lines 458-468]

Code	Quotations
6C	"…because it influences the planning it is my way of organizing myself to figure out all of the different parts of the unit that I want to plan. How I want to describe something that we're doing." [SM Lines 90-92]
6C	"…where it was so difficult before…how do I get these children to start writing…and everybody would say…have some cute sentence starter…you have story started…they're sitting there and they're staring at it and waiting. Now with these wonderful opportunities I can just say, we can have all this information first and now look at what you can pull from, and now…their creative writing books are filled." [H&E Lines 559-565]
6C	"It helps me to narrow it down…if I have a thinking map I get to the single detailed points that they need to know which I think helps the ELLs, because I think when you go…on and on about a topic the ELLs probably hear a third of that, they're still trying to process what you're saying."
6D	"We came from a very different way of thinking about, you know, I always think back to the Ven diagram and how confusing or just the space in everything and to move away and see the beauty of a double bubble map…" [V&L Lines 50-53]
6D	"Students are willing to jump right on board if you're excited about something." [V&L Lines 57-58]
6D	"…it's definitely more time consuming…because you want to make sure that the maps are used appropriately, it's not something that, it has to be planned, you can't just say now take out a map…it has to be there's a process to it and I feel that it also benefits in their learning in the same way." [H&E Lines 279-283]
6E	"…I used to try to find a map first and then work from it and now I look at what it is I want the students to learn and be able to do and then a map comes from it…" [AC Lines 9-11] "…start with the curriculum." [Line 15]
6E	"I was always thinking about the way that children should organize their work, but now even when I'm planning I'm thinking about thinking maps and I will always make sure that I know well what am I going to say to make them look up at the board and say oh I'm going to use this map, or I'm going to write this down, or I'm going to come up with it on my own. I mean in 5th grade you want them to really be able to come up with a lot of it on their own." [ER Lines 135-136]
6E	["Do you decide on the map and then look at what curriculum wants and try to fit it that way, or do you look at your task curriculum or whatever and say which maps would best meet, how do you manage that?" H&E Lines 317-320] "…sometimes I do look for ways to use them only because I want to expose them, but then for the most part the curriculum and the objectives kind of dictate what maps you're going to use." [H&E Lines 333-335]

Code	Quotations
6E	"…when you're looking at your specific objectives it's just a no brainer there's the map…" [H&E Lines 329-330]
6E	"…most times I do feel like I'm looking at what I'm expected to do and see where I'm going to fit the maps in." [H&E Lines 337-338]
6E	"I start at the beginning with…I'm going to teach a unit on fall, how am I going to do it and I go…I always have a piece of artwork, we have a piece of writing, but we…use the thinking maps to pull them together to plan it." [SM Lines 95-99]
6F	"…thinking maps definitely has influenced my teaching because I'm preparing my lessons around the maps now, whereas in the past that wasn't necessarily the case." [H&E Lines 277-279]
6F	"…I want them [3rd graders] to be exposed to all the eight maps equally by the end of the year…" [H&E Lines 325-326]
6F	"But other times…I'll say…I really haven't used the bridge map, I really need to focus that into the next lesson because I was focusing maybe too much on the circle map, bubble map, double bubble map…" [H&E Lines 340-343]
6F	"…the problem you don't want to have is that students lock themselves into one or two of them. You want them to kind of think outside the box…" [ER Lines 175-177]