MANEUVERING THROUGH THE THOUGHT STREAM:

INVESTIGATING PRESCHOOLERS' THOUGHTS ABOUT THOUGHTS

by

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ABSTRACT

This paper documents the processes of development, implementation, and refinement of an Elicitation Model for use with preschoolers. These processes are described in three studies: the Exploratory, Development, and Implementation studies. The final product, a framework model, serves as a tool to extract the thinking of young children, particularly in terms of metacognition and self-efficacy. A set of three case studies serves as the basis of the Exploratory Study in which various tasks were presented to preschoolers, and conversations revolving around the tasks engaged the children in thinking about their own thinking and abilities. The data obtained in the case studies were then analyzed and subsequently developed into the Elicitation Model within the Development Study, providing a framework for teacher-child conversations designed to support children's metacognition and self-efficacy. In the Implementation Study, the model was used in a classroom setting by three educators of varied experience. All three educators received equal training, and were observed and interviewed throughout their use of the model. Steps to improve the model's implementation were cyclically employed and documented, and further steps were designated for the model's future use. In its current form, the model serves as a stepping stone to the development of a more structured, curriculum-based implementation of the model.

Keywords: metacognition, self-efficacy, approaches to learning

SECTION 1: FOUNDATIONS

Section 1 documents the foundations of the three studies within this project. These foundations include an introduction to the concepts involved, a description of the paper's focus, and information provided in relevant literature regarding these concepts. These foundations serve as a method for understanding the academic backgrounds behind the studies and the implications of the project's outcomes.

Chapter 1: Introduction

Paige, a preschooler, sits at the table, looking at the work she has just completed. She has remembered the order of every character in the story that the woman read to her. Her face lights up. Noticing Paige's pride at remembering the order, the woman begins to speak.

"How did you make your brain remember all of this?" the woman asks, her voice full of awe and amazement for Paige's accomplishment. Paige does not answer right away; she looks as if she is thinking. The woman pauses, letting her think, and then asks, "How did your brain know this?"

Paige looks up and speaks, slowly and deliberately. "Because. I just closed my eyes, and I thought about it, and then, DING!"

The woman's eyes open wide. "You closed your eyes, you thought about it, and then DING, you knew?!" Paige nods excitedly. "Wow, I'll have to try that! Hmm. Can we try that right now?"

The two close their eyes, both thinking about a rocket ship shaped like a flower, at Paige's suggestion. Then, Paige brings a new suggestion into the scenario. "You could think about a hot air balloon, on top of the flower."

The woman opens her eyes and thoughtfully responds, "Oh, we could think about that! So, wait… Can you tell your brain what to think about?"

Paige animatedly nods and exclaims, "Mmhmm!"

"Oh, wow!" says the woman. "How do you do that?"

Paige thinks for a moment as the woman patiently waits. She then pieces her answer together with great intentionality. "You just… say… 'Can you think about how you make a rocket ship, shaped like a flower?'"

"And you just say it, and your brain does it?" The woman seems intrigued with Paige's idea, and this seems to excite Paige. She closes her eyes, her lips moving as if speaking to herself. Suddenly, her eyes flash open.

"Yeah!" she loudly exclaims. "It does!"

Focus

The educator in the transcript above is utilizing the Elicitation Model which focuses on the metacognition and self-efficacy of preschoolers. The model allows the educator to join in and to access the child's thought processes without interference or obstruction. The approach that is demonstrated within this excerpt serves as the focus of this paper.

The Elicitation Model, which provides a framework for teacher-child conversations about thinking and abilities, was developed through a process of constantly-building stages which are documented fully in this paper—qualitative case studies with three preschoolers; the analysis of case study data and the subsequent inspiration for and development of the Elicitation Model; trial implementation of the model in the classroom setting with cyclical alteration of the model; and the composition of a plan for the future improvement and application of the model.

As consistent with my personal philosophies, I viewed the finest work of each child as the best representation of his or her ability throughout the case study process, supported by the viewpoint of Developmentally Appropriate Practice on authentic assessment. This approach states that research should be "based on discovering children's best performance," which ensures that a researcher look at the child's capabilities rather than focusing on inabilities or mistakes (Kostelnik, Soderman, &

Whiren, 2007, p. 193). All information obtained from case studies and implementation was combined into the finalized Elicitation Model, which prompts child-expression of metacognition and self-efficacy concepts. Both teacher and child benefit from the model as the teacher increases his or her knowledge of the child and the child builds positive approaches to learning.

Chapter 2: Literature Review

Approaches to Learning

'Approaches to learning' is a term that was coined in 1995 by Kagan, Moore, and Bredekamp in the National Education Goals Panel definition of school readiness for early childhood (Chen & McNamee, 2011). This definition consists of five components: physical well-being and motor development; social and emotional development; language development; cognition and general knowledge; and approaches to learning (Fantuzzo, Perry, & McDermott, 2004). Out of the five components, the NEGP has designated 'approaches to learning' to be "the least understood, the least researched, and perhaps the most important dimension" (as cited in Fantuzzo, Perry, & McDermott, 2004, p. 213).

As defined by Hyson (2008), a leading researcher on the topic, approaches to learning are "the motivations, attitudes, and behaviors that children display when participating in educational activities" (p. 2). There are various components which fall under the category of approaches to learning, such as levels of intrinsic motivation to learn, interest and joy in learning, engagement, persistence, planning, attention, and tolerance for frustration (Hyson, 2008). These components all begin to develop in children at a young age and are readily observable in young children (Fantuzzo, Perry, & McDermott, 2004).

Research shows a powerful relationship between approaches to learning and immediate and long-term achievement in school, defined in terms of readiness, academic performance, peer interaction, and adult interaction (Hyson, 2008). In fact, it has been found that approaches to learning are a stronger indicator of predicting academic achievement than intelligence measures (Fantuzzo, Perry, & McDermott,

2004). Chen and McNamee identify the various effects of positive approaches to learning, including early school success, school achievement in math and reading, attention level, sustained engagement, completion of tasks, and access to learning opportunities (2011). Undeniably, approaches to learning deserve great attention, beginning at an early age.

Since approaches to learning are not entirely inborn, but rather are influenced by external factors during development, early childhood classrooms are an ideal place to promote positive approaches to learning (Chen & McNamee, 2011). It has been shown through research that early childhood educators can utilize strategies to support and develop positive approaches to learning in young children. Developing positive approaches to learning is a reasonable goal for all children; no child is incapable of developing these learning attitudes (Hyson, 2008.) As Hyson summarizes, "Research shows that if children start school with a strong set of attitudes and skills that help them 'learn how to learn,' they will be better able to take advantage of educational opportunities. While some learning skills come naturally to children, others can be developed through a supportive environment" (p. 133).

Hyson dedicates a section of her book *Enthusiastic and Engaged Learners: Approaches to Learning in the Early Childhood Classroom* to describing effective and ineffective teacher methods for promoting positive approaches to learning in young children. She states in Chapters 5 and 6 that any curriculum can be improved by integrating techniques to promote positive learning attitudes. Curriculums should be challenging, with active participation and meaningful, interesting, and relevant subject matter. Tasks and content should not be too simple or too complex, but should be matched at the individual skill level of each child. Focusing on external rewards or test

results is ineffective; focus should instead lie on ideas of competency and application in order to increase children's views of themselves as capable and knowledgeable (Hyson, 2008). This vital sense of self-confidence is also known as self-efficacy, and provides an important foundation for a child's development of his or her approaches to learning.

Hyson also emphasizes that a curriculum which revolves around approaches to learning cannot be implemented successfully unless it is incorporated into every aspect of the classroom. It cannot be done in separation, but must instead be a full environmental alteration. At the time of publication, Hyson pointed out that no specialized Approaches to Learning Curricula were available (2008). Current work instead concentrates on the integration of techniques into existing curricula.

Metacognition

Metacognition is the most foundational skill investigated in this study. In basic terms, metacognition is "thinking about thinking" (Livingston, 2003, p. 2). As further defined by Tobias and Everson, it is "the ability to monitor, evaluate, and make plans for one's learning," (1995, p. 3), and involves considering one's own thinking processes in terms of functioning, purpose, and use. Metacognition provides a groundwork for the development of other skills, such as the ability to accurately determine how much one knows or does not know, or what thinking processes one can do or cannot do (Tobias & Everson, 1995).

The researcher credited with the identification of this cognitive skill is John Flavell, who devoted some of his studies to the metacognitive abilities of young children. Flavell's article "Metacognition and Cognitive Monitoring: A New Area of Cognitive-Developmental Inquiry" concludes that young children are restricted in

their awareness and consideration of thinking processes. He states that children in early childhood engage in little cognitive monitoring, and that their attempts to do so are ineffective and inaccurate (1979). However, more recent research, as described by Hoard and Clark, demonstrates that metacognitive abilities can be identified in preschool children, despite the tendency for researchers to view the abilities from a deficit viewpoint (1992).

Hoard and Clark emphasize the need for metacognitive studies which give preschoolers proper environments to demonstrate their skills, using tasks tailored specifically to the developmental level of young children. Hoard and Clark also suggest that tasks that eliminate the need for verbal expression of ideas are more appropriate to demonstrate young children's metacognitive behaviors than tasks which rely on language proficiency (1992). This concept runs parallel to the recent trend of objectifying measures of metacognition, eliminating the time-consuming tasks of conversing and interpreting conversational evidence. One such metacognition measure is detailed in an article by Tobias and Everson, as they promote their group-administered, objectively-scored measure of metacognition (1995). Both methods aim to accurately and easily measure metacognitive abilities at an appropriate developmental level. However, both methods are missing two key elements.

The first is that children themselves need to gain awareness of their thinking processes; this is the entire basis of metacognition: self-analysis. Unfortunately, in the proposed systems, the children are simply taking part in standardized tasks, without any personal reflection involved. Research shows that individuals can improve their metacognitive abilities if teachers promote their *awareness* of their cognitive

processes (Livingston, 2003). This promotion would involve discussions and conversations, which both of the previously mentioned methods avoid.

The second missing element is that children should be given supports to assist them in portraying their best abilities. Assessment of metacognition should search for the *highest* performance level of each child so that teachers are aware of each child's individual level of understanding and capacity (Kostelnik, Soderman, & Whiren, 2007). These supports can be provided through discussions and conversations, as teachers can point out children's thinking and the thinking of others, encourage them to explain their thinking with direct questions and scenarios, integrate helpful vocabulary, invite individualized response, and prepare children for the content of questioning (Dombro, Jablon, & Stetson, 2011). Each of these strategies has been found effective in helping children to become confident and competent enough to express their knowledge of their thinking. This allows their best work to be revealed, rather than abandoning them in a standardized task and accepting the possibly-misleading results.

In summary, metacognition measures for young children should utilize verbal discussion of ideas in order to unveil detailed and accurate information, despite the extensive effort required and the need for supports in language proficiency and expression. Metacognition serves as a building block for many other cognitive abilities and real-life applications. Child and teacher awareness of metacognition is therefore essential to the formation of a strong cognitive base throughout development.

<div align="center">Self-Efficacy</div>

Albert Bandura defines self-efficacy as a "personal judgment of one's capabilities to organize and execute courses of action to attain designated goals" (as

cited in Zimmerman, 2000, p. 83). Self-efficacy is one's perception of whether or not they are able to complete a given task. Self-efficacy measures vary based on the task and the task domain (Pajares & Urdan, 2006); this means that in academic settings, where tasks involve thinking, self-efficacy depends on a person's self-appraisal of thinking processes and abilities, or metacognition (Pajares, 1996).

In causal research, it has been demonstrated that there is a strong connection between self-efficacy and academic performance (Bandura, 1982). Students with strong self-efficacy have shown increased participation, effort, and persistence when facing difficult situations, as well as a decrease in adverse emotions (Bandura, 1997). These students take on more challenging tasks (Bandura, 1977) and demonstrate more intrinsic motivation and interest than students without strong self-efficacy (Zimmerman, 2000). These qualities align with components of positive approaches to learning, (which cause the increase in academic performance), and are observable in self-efficacy studies beginning in infancy. Infancy studies are based around the Motivational Needs Theory, which states that all humans, from birth, hold intrinsic motivation due to the basic need of competence. When this basic need is met, a human becomes eager and motivated to continue upon the path of competency (Schwarzer, 1992). In other words, discovering competency in oneself breeds further competency.

Due to the evidence in such young children and the positive implications involved, self-efficacy has become a widely-addressed topic in the early childhood field. Including self-efficacy awareness in the early childhood classroom has great potential. Research shows that approaches to learning, and subsequent increases in academic achievement, are more strongly related to what a student believes about his or her capabilities than to what is actually true (Bandura, 1997). In addition, since self-

efficacy measures are tailored to task and domain, it serves as a clear predictor of performance within each achievement area (Solomon, 2003). As Pajares states (1996), "Teachers would be well served by paying as much attention to students' perceptions of competence as to actual competence" (p. 568).

Currently, suggested measures of self-efficacy for young children tend to be inappropriate. Bandura's pictorial self-efficacy scale for young children, for example, utilizes symbolic size gradations, a concept too abstract for the understandings of preschoolers or four-year-olds (Pajares & Urdan, 2006). Other studies on child self-efficacy ignore the concept of measuring self-efficacy. For instance, Seefeldt and Wasik, in 2006, describe the self-efficacy of three-, four-, and five-year-olds in one generalized measure—that they all 'have a genuine sense that they can do anything' (p. 58). The authors claim that *all* of these children are 'eager and motivated… even in the face of failure,' and that they will 'persist at things, even if they need to try the same task over and over again before they achieve success' (p. 59). This recent declaration disregards central concepts of self-efficacy, ignoring differentiation between domains, tasks, children, or environments. There is a current need for appropriate self-efficacy measures in the early childhood field.

One of the most promising suggestions is brought up by Schunk, who said that "verbalization and modeling of appropriate strategies" by the teacher and by students contribute to the students' self-efficacy (as cited in Pintrich, Marx, & Boyle, 1993, p. 187). Although not directed at early childhood, Schunk has identified a manner with which to engage children in conversations, discussions, and modeling about self-efficacy. This allows the children to become aware of and to express their self-efficacy levels and allows the teacher to become aware of the children's self-efficacy as well.

This method aligns with the teacher-actions suggested by Pajares and Urdan, which include modeling, individualizing instruction to each student, promoting competence and confidence, inquiring about self-efficacy to young children, and viewing young children from a viewpoint of capability (2006).

<div align="center">Synthesis</div>

Metacognition, self-efficacy, and approaches to learning are all interrelated, unified components with important implications for early childhood education. Children's metacognitive awareness allows them to engage in self-efficacy analysis. This analysis promotes positive approaches to learning, leading to improved academic achievement and improved social interaction. If techniques to promote awareness are appropriately applied with young children, utilizing discussions and conversations which actively involve the children, teachers will gain awareness of their students' abilities in these domains. This teacher-awareness can be cyclically employed to further the awareness of the young children. Overall, the process is worth investigation, effort, and implementation.

<div align="center">Curriculum-Based Assessment</div>

Although this project provides a specific model with which to engage with young children using discussions about metacognition and self-efficacy, there are parallels which originate in the methods of Curriculum-Based Assessment (CBA). CBA, as defined by Deno in 1987, is "any set of measurement activities that uses direct observation and recording of a student's performance in the local curriculum as a basis for gathering information to make instructional decisions" (as cited in Hintze, Christ, and Methe , 2006, p. 45). CBA is "intended for teacher use to determine

students' skills in various curricula taught in the classroom" (Idol, Nevin, & Paolucci-Whitcomb, 1986, p. vii). Simply stated, CBA is a form of assessment which takes place within the classroom context, gathering information only on what is directly addressed in this context. The development of CBA was intended to allow teachers to understand individual students and to find an appropriate match of content to child so that each child can be successful (Hargis, 2005). This is the ultimate goal: student success. Research has shown that the use of CBA does improve academic performance (Burns, 2002) due to its individualized nature.

CBA is used in an integrated format, incorporated into classroom activities daily. As Hargis states, CBA should "become the intimate companion of instruction, and, in fact… an intrinsic part of instruction" (2005, p. 15). All instruction and activities are assessment tools. The entire process is cyclical. First, instruction takes place and children engage in activities. The teacher considers and records each child's comprehension of the content. This mastery level is then applied in the next phase of instruction and activities, and the cycle progresses. It is a daily routine of matching child and content. This is the manner in which teachers of young children should investigate metacognition and self-efficacy of their students.

<center>NAEYC and NAECS/SDE Guidelines</center>

The principles of CBA also align with the National Association for the Education of Young Children's guidelines for Developmentally Appropriate Practice (DAP). The second core consideration for teachers in DAP, before making any decisions, is "what is known about each child as an individual—referring to what practitioners learn about each child that has implications for how best to adapt and be responsive to that individual variation" (NAEYC, 2009, p. 9). Each piece of

information discovered through integrated assessments should be applied on an individual basis to improve instruction for each child. This is also the core idea in CBA.

NAEYC has published a position statement and guidelines with the National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE) regarding Early Childhood Assessment Practices as well. A section is dedicated to the "Indicators of Effectiveness" for the assessment of young children, and assigns importance to many of the concepts addressed in CBA. The position statement declares that assessment data should be used to "understand and improve learning," and should be gathered only in "realistic settings and situations that reflect children's actual performance." Assessments should be developmentally appropriate and tailored to the age group and individual characteristics of specific children. In addition, assessments should only be performed if investigating content which is "developmentally and educationally significant" (NAEYC & NAECS/SDE, 2003, p. 3). Each of these guidelines is met within the principles of CBA.

Clearly, the implementation of a model which parallels the principles of CBA, NAEYC, and NAECS/SDE is both developmentally and professionally appropriate.

SECTION 2: THE STUDIES

Section 2 documents the three studies within this project. The first is an Exploratory Study, in which a case study format was utilized to determine what preschool children are capable of in terms of metacognition and self-efficacy and of the communication of these skills. The second is a Development Study, in which case study data was analyzed to find which strategies helped to draw out children's thinking and helped them to focus on their capacities as thinkers. Through this investigation, patterns were identified, and the Elicitation Model was developed for engaging children in conversations about metacognition and self-efficacy. The third and final study is an Implementation Study, in which the Elicitation Model was implemented in a classroom setting and examined for effectiveness, needed change, and future implications. All participants' names within the studies have been changed to pseudonyms.

Chapter 3: Exploratory Study: Method

The scenario provided at the start of Section 1 is an example of the Case Studies performed in the Exploratory Study. Three preschoolers, each four years old, were selected from the University of Delaware Laboratory Preschool's Pre-K classroom to provide individual, in-depth information for use in the creation of the Elicitation Model. The case studies were not intended to provide objective data or to generalize observations into facts. The case studies were instead meant to gather information to use on a foundational level.

Setting

The Pre-K classroom accommodates one of four age-groups served at the center. The classroom serves 18 children under one Master Teacher, a student teacher, and various undergraduate students from a sophomore-level course at the University of Delaware. The program's day runs from 8:45 AM to 11:45 AM, and is based around a Developmental–Interactionist philosophy. The case studies were conducted on Wednesday and Friday mornings, from approximately 8:00 AM to 12:30 PM. This time slot included the staff's pre-session and post-session meetings.

In the case studies, I worked with each child for 10 to 20 minutes per day. Our work took place primarily in a conference room that sits directly across the hall from the classroom, where we were able to converse without interruption or distraction. Throughout the case studies, I utilized observation within the classroom's activities to gather further information about the children. These observations were performed from an Observation Booth behind a two-way mirror attached to the classroom.

NAEYC Accreditation Standards

The University of Delaware Laboratory Preschool is nationally accredited by the National Association for the Education of Young Children. In order to receive this accreditation, a center must meet and maintain the given standards for quality, demonstrated through self-assessment and outside observation. In being NAEYC Accredited, it is guaranteed that the center and its staff meet 'best practice guidelines' in their daily classrooms. Consequently, for this research project, it was guaranteed that the observed staff and class structures were of high quality, as defined by NAEYC.

The NAEYC Accreditation Standards are described in the "All Criteria Document" (2011). This document supplies centers with the language of the Accreditation Criteria, as well as 'guidance' in how to apply the criteria. The University of Delaware Laboratory Preschool Program has met these criteria during NAEYC assessment. Using this document, I was therefore able to find practices of the program which would describe the classroom effectively. These relevant practices are described in detail in Appendix A.

Inventory of Classroom Practices

Although the center is NAEYC Accredited, there is the question of quality of the individual classrooms nested within the Laboratory Preschool Program. The classrooms are all included in the NAEYC observations, but a more specific measure is helpful to determine the qualities of the classroom independently. I therefore utilized a tool called *The Classroom Practices Inventory: An Observation Instrument based on NAEYC's Guidelines for Developmentally Appropriate Practices for 4- and 5-year-old Children*, created by Hyson, Hirsh-Pasek, and Rescorla (1990). The tool consists of 26

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items, ranked on a one-to-five scale, ranging from "Not at all like this classroom" to "Very much like this classroom." The items cover subjects from programs and activities to emotional climates in the classroom. Beneath each item is a place to document examples of the evidence used to determine the item's score.

The targeted classroom achieved the score for each item that aligned with the ideals of best practice as defined by NAEYC in its Position Statement on Developmentally Appropriate Practice (2009). The classroom balances teacher-directed learning with child-directed learning and provides a variety of activities for children to directly experience. The children are active in everything that they do, and interact with peers and teachers in a range of group sizes. Questions presented to the children are open-ended and revolve around ideas that are relevant to the lives of the children. In addition, teachers are affectionate with the children, creating an atmosphere of happiness and joy. Each of these qualities serves as an important piece to the high-quality that is maintained in the classroom. The completed inventory can be seen in Appendix B.

The completion of this inventory of classroom practices validates the fact that the classroom, even on an individual level, can be classified as meeting NAEYC Accreditation Criteria as a unit within the Accredited University of Delaware Laboratory Preschool Program.

Process of Identifying Subjects

In order to identify children who would provide constructive information, I met with the Master Teacher of the classroom before beginning the project. I composed a list of desired child-qualities which would provide me with relevant and varied information. I wanted to find both the most verbal and the least verbal of

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children in the class, although I requested that I not be given children without English proficiency. (Adaptation for English-language-learners goes beyond the scope of this project.) I also wanted to find children with different levels of confidence in their work, ranging from children who feel confident in everything to children who display insecurity in their abilities. In addition, the mandatory qualities of general cooperativeness and willingness to participate in individual conversations were a foundational base, as information would not be effectively gathered with a child who refused to partake in activities.

I asked the Master Teacher, Miss Kay, to observe her children over a week's time and to look for children who fit the criteria. I also asked her to search for children whose parents would most likely provide consent for their child's participation. Miss Kay identified five children who would be suitable for the project. On September 9th, 2011, she provided me with their names, which I entered into the template that I had prepared for subject selection. I observed the five children during arrival, free reading time, group circle, and activity centers, and recorded my observations in the templates. Appendix C provides an example of a completed observation form. This process narrowed the group to three children who seemed to meet the desired characteristics with great variety: Paige, Larry, and Mark.

I spoke with Miss Kay after identifying the three children, and we discussed her opinions on the selections. Her agreement was strong, and we therefore continued the project with these three case study subjects.

<center>Consent</center>

Teacher consent was obtained on September 1st, 2011. Parental consent was obtained on September 9th, 2011, for all three children, giving approval for audio

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recording. All were provided with copies of the consent forms for their personal reference. In addition, children were given an oral explanation of the study, and verbal assent was given by each child on September 14th, 2011.

Human Subjects and IRB Approval

I attended an institutional training session on the use of human subjects in research on May 11th, 2011, at the University of Delaware. The proposal for my project, entitled "Awareness of Metacognition, Self-Efficacy, and Approaches to Learning in the Early Childhood Classroom," was submitted to the University of Delaware Institutional Review Board on August 8th, 2011 and approved on August 23rd, 2011 under Expedited Review. The Approval Letter is provided in Appendix D.

Task Development

The tasks used in the case studies were developed on an ongoing basis. Each task was created according to the information uncovered in the previous task, using the recently-discovered knowledge to find a way to delve even deeper into the minds of the children. The tasks focused on metacognition in the beginning, and then transitioned into self-efficacy about halfway through the task schedule. The absence of a child also determined the depth of content in the following task, keeping the three children on the same concept level. Tasks were developed with the aim of variety. Various contexts, settings, structures, and purposes were utilized so that each child could demonstrate his or her best work. Tasks were cyclically developed and employed in this fashion over the course of four weeks.

Tasks

Beginning on September 14th, 2011, seven days of tasks were presented to the children throughout four weeks. The tasks began as individual sessions in which I spoke with the children one at a time.

The starting task consisted of introductory questions regarding metacognition, such as "What do you use to think?" as well as a general introduction of who I was and what we would be doing together. We went through a brief animal-knowledge task in which the children were each presented three groups of animal pictures: forest and jungle animals, farm animals, and everyday animals. The pictures were revealed one at a time, and the children were asked to name the animal. I utilized a checklist to keep track of the children's responses. If the response was incorrect on first inquiry, I later laid out all of the pictures together, and asked the child to identify that specific animal. This allowed me to view a more definite level of ability for the child. If any of the three children did not successfully identify an animal within either approach, that animal was eliminated from all future use within tasks. Finally, the remainder of the session served as an introduction to the types of tasks that would come in the following days. A short story, with three animal characters, was orally read to the children. No visuals or text were provided during the reading of the story. The children were then asked to take three pictures, which showed the story characters, and place them in the correct order from the story. After ordering the pictures, the children were given the option to read the story again and see if their order was correct. During the second reading, they were permitted to change their order to match the story, if incorrectly ordered the first time. From this task, a conversation regarding the thoughts behind remembering the order evolved. This opening task was not intended to gather information, but rather to familiarize the children with the tasks.

The next two tasks consisted of a similar structure, utilizing a story read orally and the ordering of pictures. These stories, though, were of longer length and contained five animal characters rather than three. Questions relating to metacognition, which asked the children to consider how their brains were working to remember the order of the animals and what their brains were thinking about during the story, were directly presented.

On September 23rd, 2011, the task format changed. The session, still held individually, began with an introduction of 'modeling.' I showed the children the pictures that they would be utilizing in their story, one of which was a horse. The horse, however, was hand-drawn. I told the children a personal story about how I could not find my horse picture and had to draw the horse instead. I modeled my thinking processes, telling the children about how I had figured out how to draw the horse. I spoke about how I used my brain, and how I tried again and again, even though I messed up. This modeling tied metacognition into self-efficacy, and introduced the concept of self-efficacy into the sessions. We then discussed how the children react when they try something difficult, and what they do when they are incapable of something. The task structure then returned to the previous form, reading a story with five animal characters and ordering the pictures. The questions in this section of the task reverted to the topic of metacognition only.

In the following week, the individualized session turned into a group session. The children came together to draw pictures of their brains, separated in different sections of the room as they drew. They were then brought together to discuss their pictures. The conversation was open-ended, although it was directed so that the children considered the purpose, use, and abilities of brains. The children themselves

altered the conversation to discuss the differences between the brains of different people, and how to make brains think what you want them to think.

The next task was a large departure from the previous tasks. The children, individually, were presented with a task that I told them I could not successfully complete. I asked them for help, and asked them if they thought that they would be able to do it. They were shown ten squares of paper, each with a number (one through ten). I told them that I was trying to remember ten animals in order just by listening to a list, but that I could not remember. They were invited to try. When they were unsuccessful, I told them that they were incorrect and asked if they wanted to try again. I took all of the pictures back, and I reread the list. The children were permitted as many chances as they wanted, and were encouraged to think of ways that they could get their brain to complete the task successfully. After the children stopped their attempts, we discussed what our brains can do and cannot do, and how we feel when we are unable to do certain tasks. This brought self-efficacy directly into focus.

For the final day, the children were brought together to read the story *I Know a Lot of Things*. Pictures and text were available for the children to view. This book speaks of things that the narrator knows and can do. The children led their own discussion of what they know and do not know in comparison to the book, and what they can do and cannot do in comparison as well. Both metacognition and self-efficacy were combined in this task, which served as a summary of the past sessions.

After the task schedule had been completed, I had formed a detailed picture of each child's awareness and abilities of metacognition and self-efficacy. I had also learned what was effective and ineffective in getting the children to speak about their

ideas, despite the vast differences in verbal expression, social interaction skills, confidence levels, and attention spans among the children.

Task Documentation

In order to specifically recall the details of each task, I consistently documented the task structure and process. If animal pictures were involved, I recorded the animals in list and pictorial form. If a story was involved, the exact words of the story were recorded, in addition to the number of words, type of story structure, and the number of characters. I recorded the questions that were raised throughout the task's completion, as well as the methods used to introduce each task.

I used a pre-made template to record further information about the task. This information included the date, time frame, setting/environment, overall purpose of the task, and any relevant notes that would prove useful in remembering the task or the process of the task as it occurred. I also recorded the presence or absence of each child for each date and provided notation of each child's progression through the presented content. This documentation allowed me to revisit the content of each task for analysis and to maintain consistency between children and tasks.

Pictorial Documentation

If a task involved physical manipulation of items or any physically observable work, I utilized a digital camera to preserve evidence of the children's thinking processes. The children were not shown in any pictures; only the work of the child was captured. Each picture was entered into a document specifically created for each individual. The document organized the pictures in chronological order by task, and included captions of the context surrounding the child's work. Using this document, I

was able to view physical evidence of each child's progression from week to week. An example is provided in Figure 1.
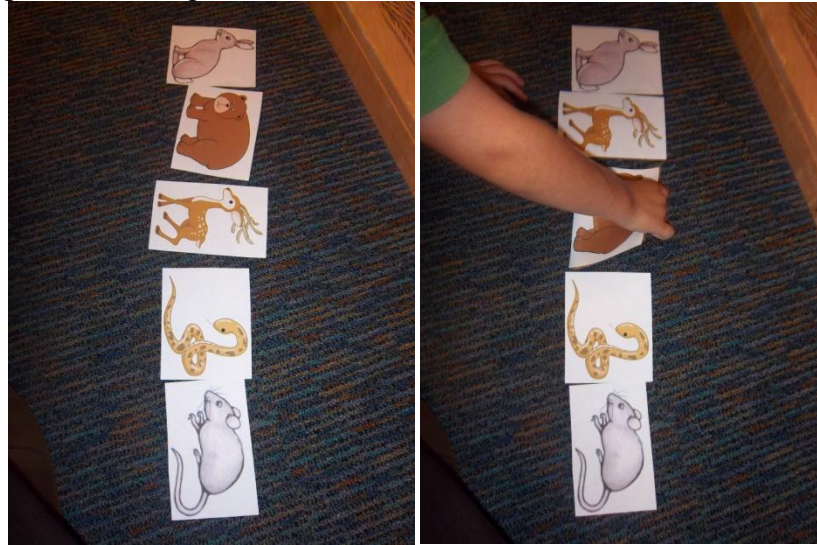
Figure 1   Larry's ordering of story characters on 9.21.2011: Larry was unsure which order was correct. He decided to switch the bear and the deer, but was not sure which order was the correct order. He was, however, confident in the other animals in the ordering.

In addition to taking pictures, I also preserved work samples when appropriate. For instance, if a child drew a picture, I retained the physical copy. I then scanned this into the computer, adding it to the child's document of pictorial evidence, along with relevant captions and details. An example of this documentation can be found in Figure 2.

Figure 2   Mark's drawing of his brain on 9.28.2011: Mark took a significant
            amount of time to complete his brain. He expressed frustration at how
            hard it was to make a brain, because of how many cracks brains have. He
            said that he used knowledge from his 'Body Book' and from looking at
            someone's brain through their mouth to know what his brain looks like.

Audio Documentation

In order to preserve the ideas expressed by the children during discussion, I

utilized audio recordings of the dialogues. This was my central form of documentation

throughout the case studies. Recording spanned from the start of the conversation until

the end of the child's session without pause, ensuring that all audio details of the

interaction were preserved.

Each audio recording was immediately transcribed after the research session.

Transcription is not a perfect representation of conversation, as it eliminates gestures,

facial expressions, and intonations. In addition, some words which prove indecipherable upon listening are also lost. I accommodated for these imperfections by documenting pauses, stutters, volumes, intonations, actions, and repetitions as I transcribed. Doing so was possible due to the short amount of time between the actual interaction and the transcription process. I also listened to the original tapes periodically in order to refresh my memory of the conversation exactly as it sounded. Using this detail-oriented process, I was able to preserve invaluable information from the case studies. A sample transcription is provided in Figure 3.

- **RG: Do we all think about the same things?**
- LARRY: I don't think so.
- **RG: You don't think so?**
- LARRY: Mm-mm (negative intonation; shakes head no)
- **RG: Why not?**
- LARRY: Because, um…. (*Pause*) I. I. I know my numbers and my colors. And, and I know what my brain does. (Upwards inflection on end)
- **RG: Hmm, do you think it does something different than my brain?**
- LARRY: No!
- **RG: You think they do the same thing?**
- LARRY: Um. Um. *(Pause)* Well, I don't think the same things. But. My brain. It does the same things.
- **RG: Oh, so our brains WORK the same way, but we think about different things!**

Figure 3   Segment of Case Study Session with Larry: October 5th, 2011

Field Note Documentation

In addition to documenting the duration of the tasks, I recorded field notes from the general classroom context in order to gain further understanding of the children's personalities, interaction styles, expression methods, and thought processes. These observations both supported my findings from the task setting and also uncovered some contradictions. The contradictions led to the development of altered task structures to better support individual children.

I also took field notes on the setting of the tasks. This included the noise and distraction level of the location and the disposition of the children, if attributable to outside circumstances such as a disturbance in class or a change in schedule.

Analysis Methods

As each task was completed, recorded, and transcribed, a new round of analysis encompassed all information to date. The system was repetitive and cyclical. After each task, I would take notes on the new transcripts. I would then return to all prior transcripts for each child, noting new comments as my understandings grew. In final investigation, all transcripts were printed and reanalyzed. I wanted to view each child as a holistic individual, and therefore combined all information, from transcriptions to field notes, to form a full picture. I also kept an ongoing list of similarities and differences between the three children, allowing me to view the entire scope of my obtained knowledge.

Each day, I utilized a template that summarized all of the information to date. The template listed all of the knowledge that I had gained about each child's metacognition and self-efficacy, along with a citation of where this information was located in my transcripts. The template also included a section entitled "What do I still

need to find out?" which contributed to the development of the following task. Another section considered how the listed knowledge could be useful to the classroom teacher, which helped me to always keep my purpose in mind, and another considered how the activity could be embedded into the classroom curriculum using ideals of Curriculum-Based Assessment. Finally, one more section listed any phrases or situations that elicited the data in the other sections. A completed example of this template is provided in Appendix E.

In addition to this system, my advisor and I met weekly to discuss task formation, transcripts, interpretations, and implications of the information. Overall, the cyclical process allowed me to fully understand the abilities of the three children.

Chapter 4: Exploratory Study: Findings

Through analysis, I developed an understanding of each child's capabilities in terms of metacognition and self-efficacy skills and awareness. Within the context of four weeks and seven tasks, I formed a strong profile for each of the three children, despite the lack of prior relationship. Each child was selected due to his or her representation of a different type of personality, learning style, verbal ability, or social interaction. Regardless of these differences, information was obtained for each child in great amount and depth.

Larry

Through the tasks and discussions with Larry, I determined that Larry can be very verbal about metacognition. He is skilled at talking about his thoughts when given the opportunity. Larry is able to express what he is thinking about, and considers his thought processes carefully. He gives realistic descriptions of thinking processes and is mature in his knowledge of remembering and generating ideas. Larry knows that actions are caused by underlying thinking processes, and knows that although everyone's brain functions in the same manner, they think about different things. He also has an understanding that he does not have to consciously make himself think, but that he can do so if desired, and he knows that he can accommodate for the limitations of his thinking processes with external supports, such as reminders or visual aids.

In terms of self-efficacy, Larry revealed a great sense of realism in his analyses of his abilities. He thinks about his prior experiences to determine whether or not he can be successful at a given task, and he is consistently of the opinion that the more he attempts a task, the more successful he will be. Although he experiences negative

emotions in connection with failure, he continues to try in order to reach success and corresponding happiness.

Larry benefited greatly from the variety provided in task structure. He was able to express his ideas more comfortably in individual settings and in tasks which provided him with direct questions to consider.

Mark

Mark, the least verbal of the three children, provided a great deal of information about his thinking processes and abilities. Through the presented tasks, I found that Mark has a firm grasp of the physical workings of the brain, understanding that it is a functioning part of the body. He is aware of when he does not remember something, and is able to express this fact. Mark also knows that thinking does not require a conscious effort, but that people can control their thoughts if they wish to. If asked, Mark can describe his thoughts at the time of inquiry, and knows that if another person were to express their thoughts, they would not be the same as Mark's in most instances. However, he is confident in the fact that multiple people can think of the same thing if they try to do so together.

Mark also revealed significant qualities of his self-efficacy perceptions. He commonly expresses that he cannot perform tasks well, even when his attempts are successful. He says that he often gives up, and he demonstrates this through various avoidance strategies when presented with difficult tasks. He is, however, able to think about ways to make up for his believed lack of ability, and also is able to identify tasks that he is capable of performing, such as building.

Mark also benefitted from the variety of task contexts. He found comfort in expressing his ideas in a group setting, where he could build off of the ideas of others.

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His ideas were mostly revealed in scenarios in which he led the conversation in his own direction, rather than simply responding to predetermined questions.

<div align="center">Paige</div>

In working with Paige, I was able to uncover large amounts of insight in regards to metacognition and self-efficacy. Her verbalizations were strong in all task contexts. She knows that thinking is a physical process, and that the workings of her brain lead her to act in certain ways. She can directly explain how thinking processes work and how to engage in thought with a specific method. Paige connects thinking and the brain with the root of who each person is, and considers thinking to be a natural process that is simply a part of us. She expresses knowledge that brains look basically the same in all people, but that people do not think about the same things due to differences in experiences. Not only can Paige describe what she is thinking, but she can also reflect on what she thought at a previous time or during a previous activity.

In terms of self-efficacy, Paige demonstrated a strategy-based approach. In order to determine if she is able to do a task, she reflects on past experiences and then attempts the task. If she finds that she is unable to complete the task, she attributes her failure to herself and her limitations. However, she does believe that increased effort can increase her ability and success. She therefore makes multiple attempts at tasks which prove difficult. Paige expresses and demonstrates that she can use her brain to come up with methods that will help her be successful if she is failing.

Paige was comfortable in all task scenarios, and was verbally responsive to all types of questioning. The variety in task structure did, however, serve to effectively provide Paige with a range of settings in which to express a range of ideas.

Synthesis

All three children, in a short time period and with no prior exposure to the content or structure of the tasks, revealed a wealth of information about their thinking processes. This in-depth information regarding metacognition and self-efficacy would serve as a knowledge base for both teachers and children in terms of thinking, task ability, and consequently, approaches to learning. After this success in eliciting information from the children, the next step was to determine what common factors had created the success for these individuals, despite their differences and preferences. What specific inquiries brought the children to express these cognitive ideas? What structures surrounding the inquiries served as sufficient supports to extract useful thoughts? These questions served as the connection between the Exploratory Study and the Development Study.

Chapter 5: Development Study: Method

After viewing the information elicited in the case studies, I reanalyzed the transcripts to find the strategies that successfully extracted the information. (The children and environment remained constant from the opening Exploratory Study.) Instead of strictly investigating the children's responses regarding metacognition and self-efficacy, I now expanded analysis to encompass the *context* surrounding the responses. This context was constructed of two parts: the questions proposed to the children and the conversational structure in which the questions were presented. These details created a picture of what elements created successful 'elicitation' of information from the children. As defined by Fraivillig, Murphy, and Fuson, 'eliciting' is a teacher's "efforts to provide students with the opportunity and necessary encouragement to express their ideas" (1999, p. 154). This definition supports the necessity of looking into both the inquiries and the surrounding structures.

Process

This phase required a great deal of transcription coding. Coding, as defined by Auerbach and Silverstein, is a manner of organizing transcripts and finding patterns within the organizational system. From these patterns, themes emerge which connect the reoccurring ideas (2003). Auerbach and Silverstein suggest utilizing highlighting on a word processor to identify patterns and also write of the importance of multiple coders, meaning that others read through the data and confirm the presence and accuracy of the patterns and themes (2003). This is also referred to as inter-coder agreement (Zhang & Wildemuth, 2009) and eliminates bias and error in coding, ensuring only the identification of legitimate themes in the data.

Through these methods, I was able to investigate the transcripts and identify various recurring patterns and themes in the questioning and conversation structures. These patterns and themes were noted through word processor highlighting and supported through the inter-coder agreement of my advisor, Dr. Cynthia Paris. Throughout the process, previously-established literature was an underlying foundation which guided the construction of patterns and themes.

Pattern Identification

The starting patterns which emerged through the coding process revolved around the effectiveness of the questions posed to the children in the case studies. Certain phrases promoted a more detailed child-response than others; in fact, some questions were unable to elicit any child-thoughts. Looking through each child's set of transcripts, I indentified the phrases which proved effective for each child. This 'effectiveness' could be manifested in length or in depth. Extended conversations, in which the multiple ideas were addressed as the result of one original questioning phrase, were considered to be 'effective.' Any response that progressed beneath the surface of the topic at hand was considered 'effective' as well, despite the possible briefness of the response. (For example, if a child was asked how he thought of an idea, he may answer "My brain." This would be considered surface-level, for it restates the topic at hand. If he instead answered, "I told my brain to think about it, and the idea came out," this would be progressing to a level of action rather than subject, which would signal effectiveness.)

Each child's 'effective' questions were compiled into a list of "Elicitation Phrases," or phrases which, when presented to the child, elicited worthwhile information. Two lists were created for each child; one documented Elicitation

Phrases which elicited child-thoughts about metacognition, and the other documented Elicitation Phrases which elicited self-efficacy concepts. Upon completion of the two lists for each child, the three children's lists were brought together by topic. The three metacognition lists were compared, and all phrases which occurred in at least two of the three lists were re-recorded in a comprehensive list of Successful Metacognition Elicitation Phrases (see Appendix F). The same process took place for the lists regarding self-efficacy, forming a list of Successful Self-Efficacy Elicitation Phrases (see Appendix G.)

After establishing transcript patterns for questioning, I found themes in the conversation structure which recurrently supported the success of the Elicitation Phrases. Fourteen structural aspects within the conversations were identified through the coding process which consistently accompanied the Elicitation Phrases. These fourteen conversational aspects were then categorized into five over-arching themes (see Appendix H).

Chapter 6: Development Study: Findings

Elicitation Phrases

The process of identifying patterns within the transcripts proved successful in determining phrases and questions which elicited relevant and useful information from children regarding their metacognition or their self-efficacy. The questions for metacognition, as seen in Appendix F, range from a focus on current thinking to hypothetical thinking situations, from general brain knowledge to personal brain knowledge, from conscious thinking to unconscious thinking. The questions for self-efficacy, as seen in Appendix G, also span a wide realm of concepts, ranging from questions about specific abilities, personal strengths, and personal weaknesses to questions about improving performance, feelings of failure, and perseverance.

Context

These Elicitation Phrases demonstrated profitable outcomes within the analysis of the case studies. However, these phrases cannot be considered in isolation. The conversational structures surrounding the use of the phrases also play a large part in the success of the phrases or questions. These contextual pieces were fully investigated within the Development Study and were organized into the fourteen structural conversation aspects, explained in Appendix H and below.

"The Thought Stream"

The first conversational strategy found effective in supporting the Elicitation Phrases is *observation*. The teacher watches and listens for a moment in which elicitation can successfully take place. These moments are circumstantial and can be identified in various ways. For metacognition, the teacher can look for a situation in

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which a child draws a conclusion, expresses knowledge, makes a decision or choice, remembers something, or says 'I think.' Any of these occurrences can serve as a doorway into effective discussion of thinking. For self-efficacy, the teacher can look for a situation in which a child attempts or declines a task, is presented with a new task, expresses an ability or inability, states the difficulty or ease of a task, or mentions something that they have or have not done before. These occurrences provide a starting point for a productive conversation regarding perceived abilities. There are other opportunities that can be utilized for the start of conversations about these topics; the provided examples, however, are easily identifiable and commonly occurring, and served as effective starting points within the Exploratory Study. These opportunities exist at any point throughout the day in a preschool classroom. All group sizes and all content domains provide the means for these opportunities to arise.

After this system of observation, the next conversational strategy is to *enter the thought stream.* In this step, the teacher enters the context without interrupting or disturbing a child's activity or train of thought. The entire process is best understood if viewed in the analogy of a stream. Imagine trying to enter a stream without making a even a ripple in the water. To do so, you have to first find an appropriate area on the bank from which to enter. You would not want to jump in from a steep cliff; rather, you would look for a place where the bank is even with the water. After you *observe* the landscape and find an effective entry zone, you can ease your way into the water without causing a disturbance.

Once you have entered the stream, you still must take great care not to upset the flow of the water. While moving about and exploring the stream, you have to make sure that you are not splashing or going against the direction of the flow. Instead, you

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must follow the stream's movements, allowing the natural course of the stream to remain unobstructed. These smooth navigational 'motions' take the form of the remaining twelve strategies of conversational structure, which fall into the following three categories: *requesting information*, *respecting the child*, and *providing information*.

These categories and strategies were developed through analysis of the transcripts, finding that these structures repeatedly surrounded the successful use of the Elicitation Phrases. Although the official categorizing and terminology of these conversational pieces did not develop until a later stage of the Development Study, in which the formation of appropriate terminology was the central focus, the conversational pieces will be referred to by their finalized terms for the purpose of clarity.

'Requesting Information' is composed of four strategies which directly prompt the child to provide information. The first strategy is *questioning*, which is simply presenting a child with a question which addresses a new concept. The questions utilized in this stage can consist of the questions listed as Successful Elicitation Phrases in Appendices H and I. ("How did you know that it was the rabbit?") The second strategy is *rephrasing*, or forming an alternate way to present the original question if the child does not respond to the first inquiry. ("How did you remember that the rabbit came first?")

After eliciting a response of some sort, the third strategy can be employed: *probing*. This strategy uses a line of questioning which delves further into or past the original question. This expands the original response and encourages further consideration of the concepts. ("What did you *use* to think about the rabbit?") To

return to our conceptualization of the 'stream,' we must not focus entirely on the surface of the water; we must instead go beneath the water, viewing everything happening *inside* of the stream. Looking only at the surface, we would miss out on all of the life which thrives within the flow. Probing is one of the most important strategies, for it allows us to see what is happening within the thought stream.

The fourth strategy within this category is *clarifying*, and may be used at any point that a child's response is unclear. In clarifying, the teacher asks the child to explain or repeat a response, depending on the nature of the ambiguity. ("What did you say that you used to think about the rabbit?") The teacher should never pretend to understand a response. The purpose of the conversation is to elicit useful information; disregarding a non-understandable response would oppose this intention.

The next category, '*Respecting the Child*,' contains four structural strategies which create a supportive setting for the child to provide information. The first is *allowing time*, or pausing after requesting information to allow the child to think and respond without pressure. There is no predetermined amount of time that should be utilized. Instead, it is a social-based construct in that the length of allowance depends on the child, the teacher, and the relationship between the two. The general rule is that the child should be given sufficient time to think, but if the child is simply having difficulties or does not know an answer, allowing time should end and a new strategy should be employed.

The second strategy within this category is *repeating to pause.* This approach requires that the teacher repeat the child's answer back to the child after he or she responds. This halts the conversation's progression and focuses on the child's response, and can take either the form of a question or a statement. The repetition

gives the child the opportunity to hear the idea in a legitimate form, and to closely consider the idea before moving on to another. ("You think that the rabbit was faster than the snake.")

The third structural strategy, *repeating to show attention*, is similar to *repeating to pause*. This strategy also requires that the teacher repeat the child's answer as either a question or statement, but for the purpose of demonstrating that the child is being heard. This form of repeating shows the child that the teacher has been listening closely and finds the child's words significant and worth attention. This encourages the child to continue responding to questioning. ("You thought about the rabbit by telling your brain to think about it for you?")

The final strategy that falls beneath '*Respecting the Child*' is *showing appreciation,* or demonstrating excitement and admiration for the child's answers. This strategy can take many forms. Phrases such as "Oh!" "Hmm!" and "Wow!" serve as 'reactive' strategies, for they show a positive, thoughtful reaction to the words of the child. Some forms are more explicit, using phrases such as "That makes sense!" or "What a thoughtful answer." Other forms appear to be evaluations, such as "You're right!" or "That's close!" However, the purpose of these phrases is not to inform the child of his or her correctness; instead, they are intended to instill a sense of competence. In any form, the teacher is essentially telling the child, "I find what you say to be interesting, thought-provoking, and valuable."

The third category, '*Providing Information*,' consists of four strategies to give children sufficient information to form and communicate ideas. The first is *informing*, or directly providing the child with factual information about a relevant topic. At times, the child will explicitly ask the teacher a question; in other instances, a teacher

may need to tell a child something specifically about a task or concept. ("I am going to ask you to put the animals in order after we read the story.") In these cases, the teacher should provide the information so that the child has material to form ideas. The second strategy is *narrating*. This is when a teacher verbally comments on child-actions which the child has not directly spoken about. This provides a verbal connection to the actions of the child, allowing the child to conceptualize what he or she did. The teacher should use this strategy directly after an important action occurs that needs to be brought to the child's conscious attention. ("You just switched the deer and the duck in your order.") The next strategy in this category is *reflecting*, in which a teacher brings multiple, past ideas together and presents them in the current context. Reflection allows the teacher to bring past conclusions or occurrences into the child's current view, continuing their momentum and organizing them into connecting concepts. ("The first time, you didn't get the order right; but then, you said that you wanted to try again, because you could do it!") The final strategy is *modeling*. Modeling is a method in which the teacher provides a structure, through words, verbally-expressed thoughts, and actions, which can be utilized by the child in similar circumstances. The model should be age-appropriate; the child must be able to understand and apply the same words, thoughts, and actions in his or her own experiences. Modeling should occur frequently and repetitively so as to provide supports for the children in thinking and communicating. ("I thought really hard about what I *can* draw that might help me figure out how to draw a horse.")

These strategies and their corresponding categories are not intended as separate or sequential, and there is no predetermined cycle or order. The strategies can be utilized at any time, in any order, and in any combination. The appropriate use of the

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strategies is dependent on each specific scenario. Keeping the stream analogy in mind, we see that the strategies are to be used in the manner that they naturally arise, using them to follow the stream rather than to obstruct the stream.

Elicitation Model

After identifying the conversational strategies which supported the Elicitation Phrases for metacognition and self-efficacy, the next step was conveying these fourteen strategies in a simpler and more comprehensive manner. Forming a visual model was the natural inclination, and the final outcome was the 'Elicitation Model.'

The finalized Elicitation Model, shown in Figure 4, consists of the five categories, (or fourteen strategies), explained fully in Appendix H.
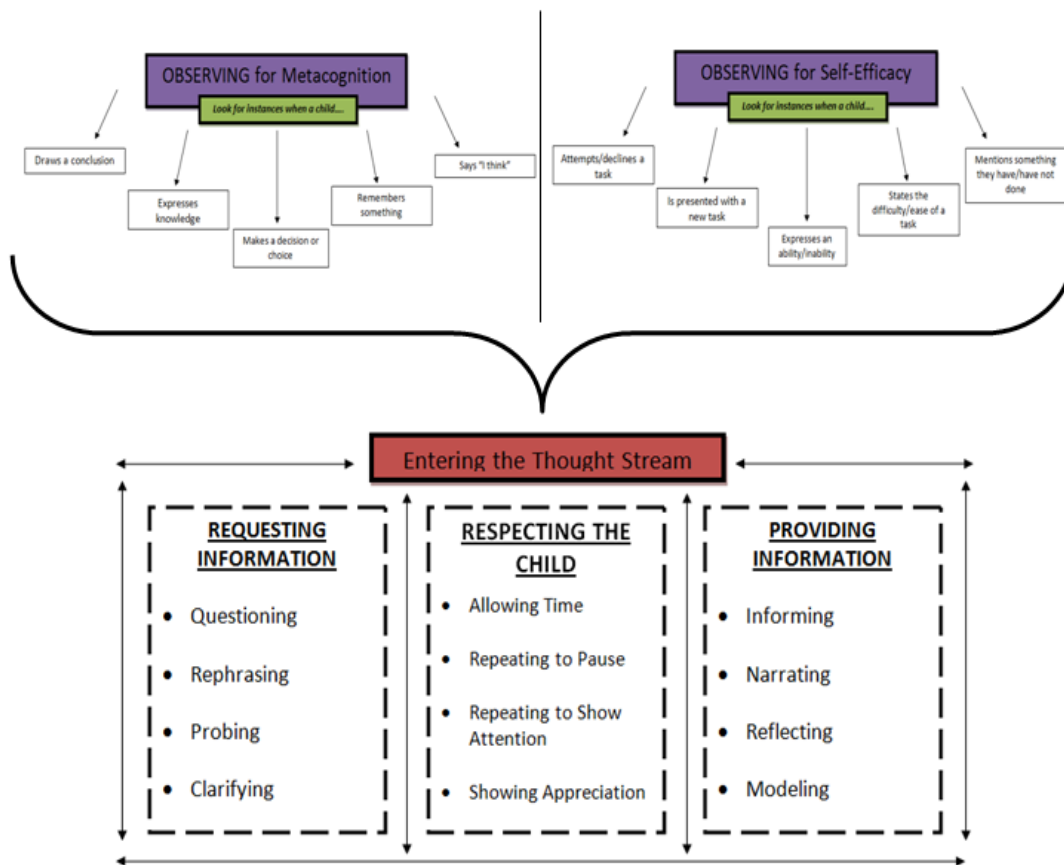
Figure 4   Full Visual Elicitation Model

The model is divided, at the top, into two separate conceptual topics for the first category of *observation*: metacognition and self-efficacy, shown in Figure 5 and Figure 6.
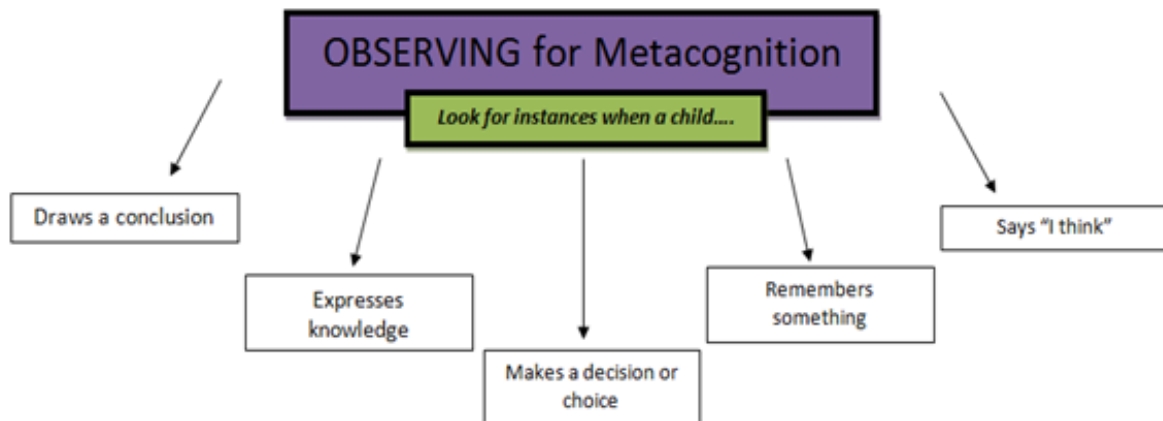
Figure 5   Observing Strategy for Metacognition (Part 1 of Elicitation Model)
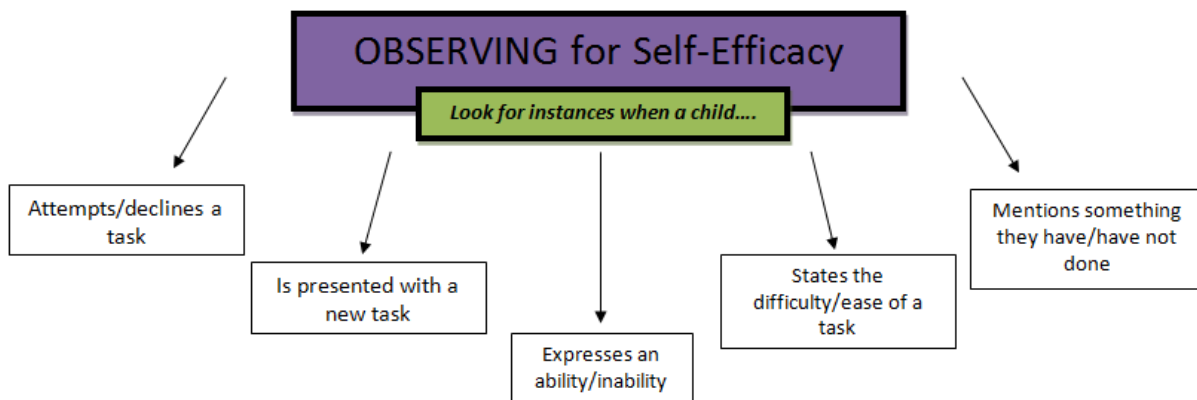
Figure 6   Observing Strategy for Self-Efficacy (Part 2 of Elicitation Model)

However, the exploration of both of these topics utilizes the same strategies in the other categories, displayed at the bottom of the model and in Figure 7.
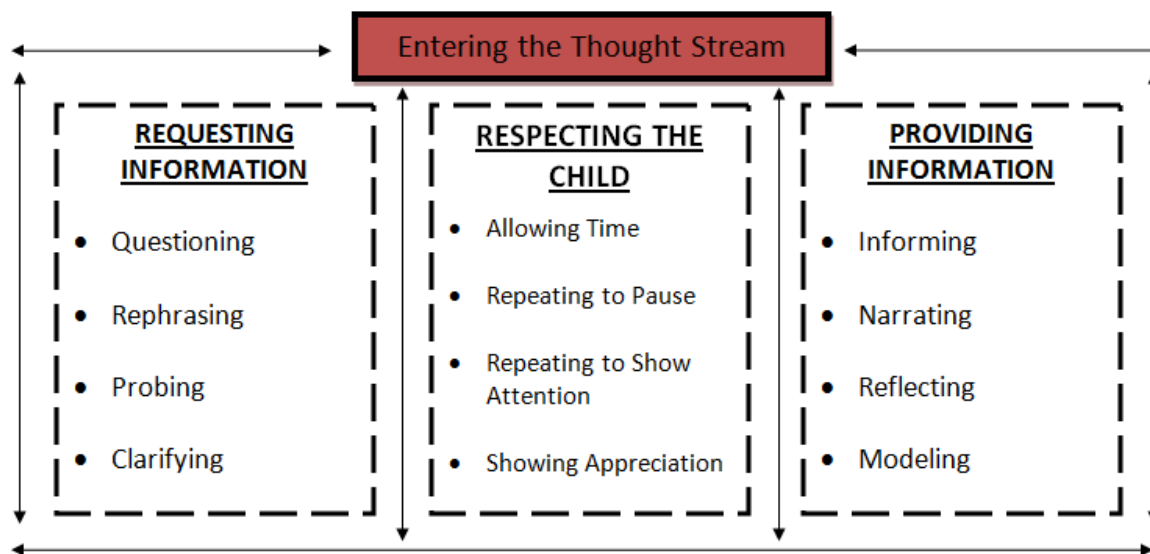
Figure 7   Entering and Other Strategies for Metacognition and Self-Efficacy (Part 3 of Elicitation Model)

Purpose/Use

The Elicitation Model, in correspondence with the Elicitation Phrases found in Appendix F and Appendix G, helps children and their teachers to become aware of their thoughts, thought processes, and abilities through a conversational setting. This awareness helps children develop foundations for positive approaches to learning, and helps teachers effectively support these approaches to learning. The model can be used to increase the confidence, awareness, and abilities of preschoolers as thinkers and as learners. As phrased by Fraivillig, Murphy, and Fuson, "Ascertaining what students know and how they think… is a critical element for advancing children's thinking. By eliciting students' responses, teachers can orchestrate learning opportunities for all students while assessing individual children's thinking" (1999, p. 154).

Chapter 7: Implementation Study: Method

After developing the Elicitation Model, the project returned to the same classroom setting as described in the case study Research Setting (see Chapter 3) to implement the model. Three educators from the Laboratory Preschool's Pre-K Classroom were trained to use the model, and in implementation, the entire classroom was exposed to the Elicitation Model by the educators. Throughout implementation, I observed from within the classroom in order to achieve clear quality. I observed all areas of the classroom during 'Activity Centers,' (when the children choose from various activities around the room), one to two times per week for five weeks. Typically, 'Activity Centers' last from 9:15 AM to 10:10 AM. I observed the three educators concurrently, as they were all engaged with the process during center-time. The personal viewpoint of each educator was also self-recorded as they worked with the children in order to accommodate for any interactions that I was unable to observe due to the simultaneous nature of the observation.

NAEYC Accreditation Standards

As mentioned in Chapter 3, NAEYC Accreditation Standards appropriately describe the Laboratory Preschool's characteristics. Appendix A lists the relevant standards for this project, which can be revisited in terms of implementation implications.

The standards are a foundation for the methods employed in the Elicitation Model's implementation. Due to the center's meeting of these standards, the training and implementation processes could disregard the development of these basic requirements of best practice. In other settings, there may be a need to address the establishment of best practice before training educators and implementing the model.

Many pieces of the model specifically rely on the prior establishment of appropriate teaching practices, as defined by NAEYC. For instance, one important criteria item is 1.B.07, which reads that "Teaching staff evaluate and change their responses based on individual needs" (NAEYC, 2011, p. 3). This is a vital first step to implementing the model, which revolves around and responds to the thoughts and actions of the individual child. Another example is 1.B.15, which requires that "Teaching staff talk frequently with children and listen to children with attention and respect" (NAEYC, 2011, p. 4). To effectively utilize the model, which depends on teacher-child conversations, there must be a foundation of respectful attention to the communication of ideas by the child.

Educator Training

Training and implementation was used to analyze the model's effectiveness in application. The three chosen educators were all working in the same classroom that provided the children for the original case studies, which gave them some fundamental awareness of the process.

Selection of Trainees

The University of Delaware Laboratory Preschool accommodates educators of various levels within its classrooms. There are Master Teachers which head each classroom; there are Student Teachers, which are senior-year Early Childhood Education students from the University of Delaware finishing their final requirements for a Bachelor's Degree; and there are sophomore-year Early Childhood Education students from the Human Development and Family Studies 224 class who have finished approximately the equivalent of an Associate's Degree.

I kept the same classroom setting as used in the Exploratory Study due to Miss Kay's prior exposure to my research. Miss Kay's student teacher expressed willingness to help with the project and was therefore designated as a trainee. To include a teacher with less experience as well, I consequently sought out a student from the Human Development and Family Studies 224 class. Miss Kay suggested this particular student due to her mastery of basic best practice in the classroom.

The three educators' education levels are representative of the current work force of early childhood educators. In the field, teachers range from holding Associate's Degrees to holding Ph. D Degrees. This implementation setting, with these three trainees, provided a wide range to observe. Due to the diverse experiences and training of each educator, different abilities in implementation were expected.

The importance of the prerequisites of professional education was analyzed in the implementation of an elementary mathematics elicitation framework by Fraivillig, Murphy, and Fuson. The success of implementation of their framework corresponded with the level of experience and training of the teachers, due to the pedagogical fundamentals that only some educators possessed (Fraivillig, 1999).

Time Span

Training for implementation began at the end of October, continuing until the start of formal implementation on November 2nd, 2011.

Foundational Interview

Before training, a foundational interview was held with each educator. The three educators were verbally presented with questions regarding their perceptions of four-year-olds in terms of metacognition, self-efficacy, and verbal expression; the

ways in which they would elicit this information from a four-year-old child; and the amount of time that they dedicate to considering these concepts in the classroom.

The interviews were audio recorded and transcribed immediately following the session. The responses demonstrated a significant range. One educator expressed that children of this age are mostly incapable of considering their thoughts and abilities, and that they do not yet possess the language or thinking processes to express these ideas. On the contrary, another educator said that these children are absolutely capable of considering and communicating these concepts, if given support from the teacher. In terms of eliciting the information from children, responses varied from uncertainty to the provision of specific activities, circumstances, and questioning methods. The differences in these responses did not align with any particular educational or experiential level.

When asked about the extent to which they consider these ideas in their teaching, the answers were quite similar for all three educators. They all said that they see the worth in being conscious about metacognition and self-efficacy awareness, but that they do not tend to focus on these concepts during their interactions with children.

These interviews provided a starting-point for training. I was able to view the beliefs, viewpoints, and prior experiences of each educator and apply that knowledge to my presentation of the Elicitation Model and its components. An example of this interview, as completed by the Master Teacher, is provided in Appendix I.

Training Process

The training process consisted of two basic parts: the provision of materials and the explanation of materials. Each educator was given the schedule for implementation, the visual of the Elicitation Model, explanations of the strategies, and

lists of successful Elicitation Phrases. (The model and Elicitation Phrases were, at first, only directed at metacognition concepts. The self-efficacy segments were given to the educators mid-way through implementation, after mastering the metacognition process.)

Using the supports, I explained the Elicitation Model and its components. We discussed any questions that they had and the implications for implementation. The educators were encouraged to use the strategies during the next week, without the pressure of observation, and during the pre-session on Day 1 of implementation we went over their opening experiences with the model. After concerns were addressed, the educators began implementing the model under observation.

It must be noted that training did not end as implementation began. The entire process of implementation was a repeating cycle of training. It was collaborative and iterative, revolving around a system of continuous observation, discussion, and adjustment.

Classroom Implementation

Although the Elicitation Model is grounded in data, the model is not complete until implemented in the field and studied for its application. The implementation of the model paralleled T2 Translation, in which researchers "study and facilitate the application of research findings to the community" with the goal of "enhancing the adoption of best practices in the community" (Center for Clinical and Translational Sciences, 2007). In other words, implementation of the Elicitation Model was used to refine and promote its applicability in the early childhood community.

Schedule of Implementation

      Formal implementation, following training of the three educators, began on November 2nd, 2011. Each week, the educators were involved in a pre-session meeting and post-session meeting and were observed throughout the span of a classroom day. The focus of observation took place during Activity Centers. This schedule remained constant until the end of implementation in early December.

Supports Utilized

      The supports for implementation were altered as necessary. Implementation began with the use of a list of Elicitation Phrases regarding metacognition (and later self-efficacy) that were relevant to the classroom setting. The educators were instructed to use these questions when appropriate and to record the applied phrase and its results in a blank checklist provided on clipboards. (This system aligned with typical classroom practices, and therefore was comfortable for the educators to use. Other strategies could be used in other classrooms with the same effectiveness.) They were asked to keep the fourteen strategies of the model in mind, applying the concepts studied throughout training. The most important skill was observation, finding appropriate moments to apply the Elicitation Phrases and Elicitation Model.

      This support, however, proved difficult to use during Activity Centers due to the extensive selection process and the writing required. The supports were therefore modified—the Elicitation Phrases were narrowed to those with the most probable relevance and placed in a chart with an area for results. Ways to rephrase the questions were provided, eliminating the impromptu creation of alternate phrasings and structuring the strategy of 'rephrasing.' A reminder to repeat the child's answer was

then listed, (the strategies 'repeating to pause' and 'repeating to show attention'), and relevant 'probing' questions were provided.

These modifications proved effective. The next change created an even more efficient system. For both metacognition and self-efficacy, the educators were asked to study the Elicitation Phrases and identify the ones that they would feel the most comfortable using. Each educator was then provided with a personalized chart to use throughout the day. The chart was also extended with blank spaces so that the educators could record effective questions or strategies that were not provided to them. An example of the final support system, with sample educator responses, can be viewed in Appendix J. The names of noted children have been changed.

The support system was used in combination with observations to record the full scenario for each educator. It was also used to identify areas needed for improvement. For instance, in the provided example in Appendix J, the educator was able to see that she needed to increase her use of 'probing' questions instead of stopping with the initial Elicitation Phrases.

Observation Process

Observations during implementation primarily took place from within the classroom for improved quality during Activity Centers. I recorded, with as much detail as possible, the course of interaction between the educators and the children. I noted both appropriate and inappropriate uses of the model; missed opportunities; ways to extend use of the model in specific scenarios; relevant examples from the case studies to draw parallels; and specific instances in which the application of the model was superlative.

Free-reading time in the morning, group time, transitions, and other relevant classroom activities were also periodically observed from the observation booth attached to the classroom. This provided a non-intrusive way to see if the principles of the model were carrying into other areas of the classroom. On a few occasions, I observed Activity Centers and other activities from the booth on days without informing the educators of my presence. This allowed me to view their natural application of the concepts.

Discussion Process

Discussions took place during pre-session and post-session meetings. No comments were given during interactions with children; rather, the educators were allowed time to truly experiment with the model. In post-session, each educator was given comments on how to improve or on what they had mastered based on observations, their charts, and their input. They were also given the opportunity to make suggestions for the improvement of the supports and implementation methods. Email was another manner of communication which allowed the educators to express questions or concerns outside of the research setting.

Cyclical Change

The entire process was one of change. If a problem with implementation was encountered, it would be discussed and implementation would be altered. This is evident in the evolution of the support system, for instance. Input on the model was bi-directional in all cases—not only were the educators given tips on the model's implementation, but the educators gave suggestions for implementation as well.

Revisiting

At the end of the implementation process, the educators were asked to answer the same questions as presented in the opening interview. In this case, the educators were provided the questions in written form and asked to record their answers, so as to ensure truthfulness and to allow the educators freedom to reflect on their experiences.

Documentation

Multiple methods of documentation were utilized throughout implementation. Written notes were taken during in-class observations and during observations from the observation booth. Educators' input was self-recorded in chart format and also provided verbally during pre-session and post-session meetings. The verbal input was documented through note-taking on a word processor. The final interview was recorded by the educators on a provided handout. Overall, all information was preserved in written form.

Analysis

The process of analysis was cyclical as well. All information to date was reviewed prior to and after each implementation session. This allowed a holistic image of the implementation's progression to develop and to remain relevant, and helped to facilitate the cyclical change of the implementation process. In-class observations, educators' notes, interview documentation, meeting and discussion documents, and observation booth notes were all reviewed and reanalyzed, and were then applied to the following implementation day.

Chapter 8: Implementation Study: Findings

Implementation of Metacognition Strategies

The first two weeks of implementation focused on metacognition. In the opening week, pre-session reviewed and addressed any concerns about the information presented during training, including the model, Elicitation Phrases, and strategies.

On the first day of implementation, the model's application was limited to the math and manipulatives area to create a focused environment for experimentation. I observed the area as the educators cycled through and took notes on their use of the strategies and model. During post-session, I presented my notes to the educators. Most of my observations showed that the educators were only using the model on a surface level. They would ask a question without building context, and would not use probing to delve deeper into the topic. For instance, in multiple instances, the educators stopped questioning the child once the child mentioned his or her brain. Although this is a possible first step to addressing the topic of metacognition, it does not ask the child to consider his or her thinking processes *within* the brain. We reviewed the 'probing' strategy extensively during this post-session meeting.

In this meeting, the educators were also invited to present questions about the model. One educator was concerned about how to handle a situation in which a child simply walks away from a question, or does not provide a response. We discussed the variances that occur in children's comfort zones, and the educator came to the realization that some of the model is dependent on the *context* of questioning, or the situation that the questioning is embedded in. I assured the educators that the model is not intended to have a 100% success rate; if a child does not respond to questioning in one area, it is acceptable to try the strategies again in another area. Educators should

find the preferences and inclinations of each child, and utilize this knowledge to find the most effective scenario in which to apply the model. During this post-session, the educators expressed that they would like to try the model in areas of the classroom outside of the math and manipulatives area. This led to a new system in which each educator utilized the model in any area of the classroom, providing more flexibility and opportunity.

The second week of implementation began with a pre-session which reviewed the model and emphasized forming context and probing. We discussed questions and concerns and then continued implementation.

In this week, it seemed that the purpose of the questions was lost, as the educators were instead focused solely on using the questions. It is important to reemphasize that the goal of the model is a more positive approach to learning. We want children to be perseverant and intrinsically motivated. In order to develop this approach in academic settings, children need to be able to think about their own thinking and then consider it in terms of ability. We want children to think about what is going on in their brains, and the Elicitation Phrases and the Elicitation Model allow educators to assist and access that type of thought. This post-session discussion set the standard for the remainder of implementation.

Each educator was also offered individualized evaluation in this post-session, as I described the strategies that each educator had mastered and the strategies that could still use improvement. All educators continued to have difficulty with probing, and we practiced forming questions that we could use to probe. We created a sample situation in which the educator posed as the child, getting to experience 'probing.' I asked the educator to think of her favorite thing to do. We then engaged in a back-and-

forth conversation in which I used questions such as, "What are you thinking about? How do you know? Did you tell your brain to think about ___? How did you do that? Do you have to *tell* your brain to think about these things?" This provided a basis for discussion on ways to delve deeper into the thinking of the children. It also led to the development of the new chart system in which sample probing questions were provided beneath each Elicitation Phrase.

In the third week, the educators were introduced to the concepts of self-efficacy during pre-session and provided with the model for self-efficacy and the list of self-efficacy Elicitation Phrases. The implementation of self-efficacy, however, did not begin until the following week.

In the final week of metacognitive focus, the educators began to apply the model with new variety. Rather than simply asking the first question listed on the chart, the educators searched through the chart of phrases and chose the appropriate line of questioning for the scenario. The new chart, with probing questions provided, did increase the frequency of 'probing' use. During post-session, however, probing raised multiple concerns. The educators felt that they were not receiving new information from the children when using the probes, and therefore disliked using the probes. We discussed the 'thought stream,' or the flow that the educators are to follow with least interference. To be successful, probing questions must align with the direction of the conversation and the child's thoughts. Just because a probing question is suggested under an Elicitation Phrase does not mean that it will be appropriate. Just as the educators began selecting Elicitation Phrases based on context, they must select probing questions based on context as well. This was established as a goal for the following week, when self-efficacy would formally begin.

Implementation of Self-Efficacy Strategies

During our first pre-session for self-efficacy, the educators expressed that they felt more comfortable with the self-efficacy concepts than the metacognitive concepts. At first, I thought that this was due to their prior experience with the model upon implementation of self-efficacy. However, the educators said that it was because of the concreteness of the self-efficacy Elicitation Phrases in comparison to the questions for metacognition. This led to a discussion about the abstractness of metacognition. Due to the foundational nature of metacognition in regards to self-efficacy, the more abstract concept of metacognition is the one that must be addressed first in training and implementation, starting with the more difficult idea. This made the implementation of metacognition more complex and the implementation of self-efficacy simpler.

The educators' comfort with self-efficacy was observable as each educator provided more data on their charts and utilized more Elicitation Phrases than in metacognition. During post-session, questions were more in-depth and based on application. For instance, rather than asking about how to use the model, they posed questions about how to apply the model with non-verbal children, or with children with special needs. Although these aspects extend beyond the scope of this project, they are vital future considerations for successful implementation of the model in the classroom setting. This demonstrated that the educators had, in self-efficacy, moved past following the instructions and into the model's practical use.

On the final day of self-efficacy implementation, the educators had no questions prior to or after implementation, and I had no concerns after observation. The project closed with an interview in which the educators responded to the questions presented to them at the start of training.

Effective Aspects

The effectiveness of the Elicitation Model's implementation can be broken into the use of specific strategies within the model. The educators were all able to grasp the use of *observation*, finding appropriate moments in which to start a conversation. On the whole, the use of this strategy was effective, for the educators did not attempt to start conversations during any inappropriate contexts. However, there were frequent opportunities for elicitation that were missed by the educators. I believe that the frequency of these 'missed opportunities' would diminish with further use, as the educators would become more natural in their use of *observation* and would notice opportunities in more circumstances.

By the end of implementation, the educators were able to enter the context of conversation smoothly (*entering the thought stream*). *Questioning* was also used effectively, as the educators experimented with various elicitation phrases, and *clarifying* was naturally utilized to comprehend the responses to this questioning. *Rephrasing* was used when necessary, supported by the listed options on the provided chart. The educators allowed the children time to respond (*allowing time*), provided content to support the conversation (*informing*), and described non-verbalized actions to the children as they worked (*narrating*). In addition, the educators utilized *showing appreciation*, providing feedback to responses which conveyed a sense of value to the children. These nine strategies were picked up quickly and executed successfully by all three of the educators; the specific strategies are each supported by the ideals of best practice in early childhood that are emphasized in the University of Delaware Laboratory Preschool Program, which could account for this level of mastery.

The implementation system also was structurally effective. Pre-sessions and post-sessions engaged the educators in detailed conversations about the model, and

allowed the educators to express any concerns. The cyclical nature of the implementation process mobilized these concerns, using them for immediate change, and the observation system within implementation provided supports for understanding and applying this change.

<div align="center">Closing Educator Interviews</div>

At the end of implementation, each educator was asked to answer the same questions that were presented to them at the start of training. This reiterative interview process demonstrated how and to what degree the viewpoints of the educators had changed through training and implementation. Overall, the interview showed that the implementation process promoted relevant educator advancement, from both the educators' view and from my view as a researcher.

The responses of each educator showed growth in skill level, a strengthened belief in the capabilities of young children in terms of metacognition, self-efficacy, and verbal expression, and an increase in the amount of time dedicated to these concepts in the classroom setting. One difference between educators, however, was in the ways that the educators judged their own performance. Responses ranged from explaining how they had improved and gained competence to explaining that they "try… but often do not extend deep enough after they provide an answer." Differences in confidence in these skills correlated directly with education level and experience of the educator, indicating that the mastery of the skills may have depended, to a degree, on these qualities. An example of the closing interview, completed by the Master Teacher in the classroom, is provided in Appendix K.

Ineffective Aspects

Despite overall success, there were five strategies in the Elicitation Model which were not fully grasped in implementation. *Probing* proved difficult throughout the process, as the educators continually stopped their line of questioning at a surface level. (This was improved upon once the probes were provided in the charts.) The educators often forgot to utilize repetition of any kind, reacting to the child's words rather than restating them (*repeating to pause*, *repeating to show attention*). In addition, *reflecting* was absent in the conversations. The educators expressed difficulty in finding the time to reflect with the child, feeling the need to move on to other children or another activity. Finally, *modeling* was not observed during implementation with individual children. The Master Teacher often modeled concepts in group time, which I observed from the observation booth, but the educators were unable to integrate this modeling into individualized conversations. The educators articulated that they could not find a balance between following the natural thought stream and creating a modeled scenario.

The degree to which these five strategies were utilized did vary. On one occasion, I used the observation booth without the knowledge of the educators, while they were instructed to practice. Each of the five strategies that were typically ignored was used more frequently and effectively. The educators spent a longer amount of time on each individual child when the pressure of observation was not present. This may signify a need for a different style of implementation, in which educators are given time to experiment without the interference of outside observers. The educators may have felt pressured to fill their provided charts, rather than focusing on a few solid interactions.

The use and success of these strategies also varied between self-efficacy and metacognition. As self-efficacy became the focus, the educators began engaging the children in *metacognitive* conversations naturally, without the supports, and demonstrated more frequent and effective use of the five less-present strategies. Although the self-efficacy conversations did not progress to this level by the end of implementation, it seems that more natural use of these conversations could be the gateway to improved strategy use.

SECTION 3: SUMMARIES AND CONCLUSIONS

Section 3 details the future of the Elicitation Model, based on needed changes discovered throughout the project, the needs of the general educational community, and the inevitable alterations that will occur with future applications. Conclusions regarding the background, development, implementation, and future of the model are drawn and connected to possible outcomes and to plans for next steps.

Chapter 9: Future Steps

Educator Training

Training was primarily successful, as it led to a mostly effective

implementation process, but there are areas which could use improvement. One area is

the original presentation of the model. The educators were given written and pictorial

representations of the model, strategies, and Elicitation Phrases. These were explained

to the educators and discussed. However, the educators were not provided any

examples of the model *in use*. In future trainings, educators could benefit from video

or audio examples of the model in use, showing the effective uses and applications of

the model, the Elicitation Phrases, and the strategies. Not only would this demonstrate

the value of the model to the educators, but it would provide the educators with

concrete examples to use as a standard when engaging in their own conversations

during implementation.

There is also a need to convincingly demonstrate the worth of the Elicitation

Model to the educators at the start of training. Throughout the training and

implementation processes, the student teacher and HDFS224 student both expressed to

the Master Teacher that they did not understand *why* they were learning about the

model. This is difficult to convey to educators who have not yet experienced the

results of the model. The educators must somehow conceptualize a connection

between conversations about thinking and approaches to learning throughout

educational careers. This is an abstract connection to make, without immediate

evidence. Training, then, should include a demonstration of the effects of the model's

use. Videos, as previously mentioned, could show a child's approach to a task before

exposure to the model, and then show the child's approaches after experience with the

model. This would show the importance of the Elicitation Model in a concrete manner and possibly inspire more educator belief and motivation in the process.

In addition, training could be improved by presenting the concepts of metacognition and self-efficacy simultaneously, rather than beginning with metacognition individually. Metacognition is more abstract than self-efficacy, as expressed by the educators in this implementation. Presenting the model with self-efficacy at the start, then, could give educators a more tangible way of viewing the elicitation process and strategies than metacognition would provide. This may lead to more solid understandings and to a smoother and more effective implementation.

Implementation

The implementation process could be improved as well. The first area is the supports provided. In this implementation, the educators were given the visual model, written descriptions of the strategies, and chart templates listing possible elicitation phrases and strategies for use in conversations. The supports gradually became more in-depth and specific as the process progressed. Although this method allowed the supports to be individualized for the particular classroom setting, the educators seemed to develop a dependence on the supports, rather than internalizing the strategies. If future implementation timelines were extended, gradual refinement of supports could still be utilized, but time could also be provided for the educators to work *without* the supports. This would encourage natural use of the model. This was viewed in the area of metacognition once self-efficacy supports were brought into center focus—the educators began to naturally use the metacognition model without supports and made use of more strategies in a more effective manner.

More natural use of the model occurred when the educators were unaware of being observed—they consistently used the strategies that they typically left out during structured observation. Allowing the educators freedom to practice, while still structuring the context and providing pre-session and post-session support, could promote more inherent use of the model and its strategies.

Finally, the implementation process should include more examples of effective uses of the model and strategies. Creating sample scenarios with the educators would be a beneficial addition to each pre-session meeting, focusing on the area of the model which is currently giving the educators trouble. In this context, the educators could be talked through the strategy and given tips and instructions while trying the model,.

Support Systems

In both the training and implementation processes, a simplified support system is necessary. The model, strategies, elicitation phrases, and applicable charts must be presented in a more understandable manner. Eliminating jargon and extensive explanations would make the model more user-friendly, increasing the chance of success in the model and the effort and positive expectations of educators. Also, this simplification could create a more direct path from training to implementation, reducing the amount of time needed for the educators to conceptualize the ideas.

In realizing the need for this change, I have devised simplified supports which are presented in Appendix L through Appendix P.

Curriculum Model

The current Elicitation Model disregards important aspects of implementation due to this project's limited scope. Non-verbal children, children with special needs,

children without English language proficiency, children with hearing impairments, and children with social, emotional, and behavioral disorders would all potentially be unable to interact with the model, as the model is dependent on spoken language in English. A more comprehensive model is necessary, and would be most effectively achieved through the development of a fully-integrated curriculum model. Embedding the model through the curriculum would allow teachers to apply the model in a variety of activities and group sizes, with various materials and content, and with a range of data collection and assessment strategies. Classroom methods which are already in place for each child's needs can be accessed and applied to the model, and each child's *strengths* within the classroom, from transition times to recess to teacher-led activities, can be utilized to increase accessibility for the children mentioned above.

In addition, the current Elicitation Model depends on the classroom's pre-established activities and materials. In order to maintain the objectives of these activities while implementing the Elicitation Model, a very high level of pedagogical skill is required. A curriculum model would eliminate the need to form this difficult balance of content, explicitly providing integration methods so that activities could consistently encompass both content matter and elicitation strategies.

Future Plans

From this point onward, the project is ready to disseminate. The Elicitation Model and its accompanying supports will be presented in two professional workshops in professional conferences for early childhood educators in Spring and Summer of 2012.

However, recognizing the potential of embedding the model throughout the curriculum, I have initiated plans for developing such a program. During the summer

of 2012, I will be working with my advisor, Dr. Cynthia Paris, to embed the model throughout the preschool curriculum in a preschool classroom at the University of Delaware Early Learning Center in Newark, Delaware. Based on what is learned from documentation and refinement over the summer, the curriculum model will be implemented during my Student Teaching placements and my Honors Capstone Course in my final semester at the University of Delaware, Fall of 2012. After this implementation, I will make alterations to the model as needed. The curriculum model will then be documented and disseminated in a separate publication.

Mutual Adaptation

RAND Change Agent Studies

In considering implementation of any model or curriculum, there are three possible approaches. The first is the "Fidelity Perspective," in which application of a curriculum model is only considered successful to the degree to which the teachers are able to carry out curricular change *as directed*. This method considers the original plan to be of highest importance. The second possibility is "Curriculum Enactment," and falls entirely on the opposite end of the spectrum. In this method, curriculum implementation is 'successful' once it is entirely recreated by student and teacher. In "enactment," the classroom's personalized alterations are of highest importance (Snyder, Bolin, & Zumwalt, 1992). These approaches, located in the extremes of the curricular range, are not considered to be of best fit for this project's curricular outcome. The third approach, "Mutual Adaptation," provides the desired results.

"Mutual Adaptation" stems from the RAND Change Agent Studies in the 1970s, in which 293 reform projects were investigated in schools throughout the

United States (McLaughlin, 1990). The concept encompasses the idea that an external reform program and a school program will both change during the implementation process (Reiser et al., 2000). Those implementing educational models and curricula often assume that the only changed element will be the classroom, staff, or school where the program has been implemented. These people believe that the model or curriculum should be applied only as intended, in absolute and strict adherence, following the Fidelity model of application.

In this project, however, the goal is that both the model and curriculum will change to fit the classroom, just as the classroom will change to fit the model and curriculum. The model and curriculum will only exist in this starting form until implementation begins. From that point on, the model or curriculum should evolve and mold itself to fit the various contexts in which it is used.

As quoted in Spector's *Handbook of Research on Educational Communications and Technology*, "If the change effort is the seed that will yield a better school, then we must pay as much attention to the soil as we do to the type of seed" (2008, p. 624). The one limitation in this, though, is the risk of *lethal adaptation*, a term coined by Brown and Campione in 1994 (Spector, 2008). In lethal adaptation, the changes to the reform program are so extreme that the original purpose of the reform is no longer intact. This aligns with the concept of "enactment" and could reduce or even eliminate the desired advances of the reform. It must be kept in mind that although some adaptation of reform is to be expected and encouraged, there must be a limit to the deviation from the initial vision.

Future Implications

        The Elicitation Model and the curriculum which has yet to be developed are not intended to be implemented with uniformity in all programs and classrooms. Mutual adaptation is expected and anticipated in the development of the model. With this adaptation in mind, the success of the model is based both on local factors as well as the characteristics of the model (McLaughlin, 1990). Clearly, the model must have a solid research basis and methodology; mutual adaptation is not to be used as a defense for the failure of an ineffective model or curriculum. Nevertheless, it must be acknowledged that the model cannot be guaranteed effective in all settings. If the classroom or program is unable to adapt to the model, or if lethal adaptation takes place, the intended results of the model will be unachievable. However, if adaptation of the model and program is attained, the intended results will most likely be reached.

        The model will never be implemented in the same way twice. The model as presented will, in fact, *never* be implemented exactly as presented. This is not a problem; in fact, this is a strength of mutual adaptation, for the model will mold to the classroom and strengthen its application in each specific setting.

Chapter 10: Conclusions

"How did you make your brain remember all of this?" the woman asks, her voice full of awe and amazement for Paige's accomplishment. Paige does not answer right away; she looks as if she is thinking. The woman pauses, letting her think, and then asks, "How did your brain know this?"

Paige looks up and speaks, slowly and deliberately. "Because. I just closed my eyes, and I thought about it, and then, DING!"

The woman's eyes open wide. "You closed your eyes, you thought about it, and then DING, you knew?!" Paige nods excitedly. "Wow, I'll have to try that! Hmm. Can we try that right now?"

Such a short conversation, seemingly typical in the early childhood classroom, can hold great information for teachers and for children. The conversation must be conscious and mindful; it must request information, provide information, and respect the child. The teacher must navigate the thought stream of the child while taking guidance from the child's direction, rather than leading the expedition with a pre-determined destination. The conversation is fluid; it is dynamic; it is the outward expression of the mind of the child.

The Elicitation Model for this type of conversation, presented in this project, may prove useful in both early childhood education settings and in general society. According to Hyson (2008), supporting children's development of metacognition and a sense of efficacy as learners help to develop positive approaches to learning in young children, approaches which have important implications for a child's approaches to tasks now and in the future.

The implementation documented here has significant limitations which overshadow these far-reaching implications of the model. Implementation utilized one staff, in one context, and in one trial. The model was applied with one age group, one classroom, and one time segment. Differentiation of implementation is necessary to determine the effectiveness of the model in diverse circumstances and to determine necessary changes.

Questions remain at the end of this project: Can the model apply to a broader population? Is it feasible to embed the model within a curriculum in which attention may be given to children with a range of skills and needs using individualized approaches throughout the day? And if so, can more children be given the opportunity to develop positive approaches to learning for use throughout their lives?

REFERENCES

Auerbach, C. F., & Silverstein, L. B. (2003). Qualitative data: An introduction to coding and analysis. New York, NY: New York University Press.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37(2). Retrieved from http://jamiesmithportfolio.com/EDTE800/wp-content/PrimarySources/Bandura3.pdf

Bandura, A. (1997). Self-efficacy: The exercise of control. United States: W. H. Freeman and Company.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191-215. Retrieved from http://www.des.emory.edu/mfp/Bandura1977PR.pdf

Burns, M. K. (2002). System of assessment to intervention using curriculum-based assessments. Intervention in School and Clinic, 38(1), 8-13. doi: 10/1177/10534512020380010201

Center for Clinical and Translational Sciences. (2007). What is translational research? Retrieved from http://ccts.uth.tmc.edu/what-is-translational-research

Chen, J., & McNamee, G. D. (2011). Positive approaches to learning in the context of preschool classroom activities. Early Childhood Education, 39, 71-78. doi: 10.1007/s10643-010-0441-x

Dombro, A. L., Jablon, J., & Stetson, C. (2011). Powerful interactions: How to connect with children to extend their thinking. Washington, DC: NAEYC.

Fantuzzo, J., Perry, M. A., & McDermott, P. (2004). Preschool approaches to learning and their relationship to other relevant competencies for low-income children. School Psychology Quarterly, 19(3). Retrieved from http://psycnet.apa.org/journals/spq/10/3/212.pdf

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. American Psychologist, 34. Retrieved from http://psycnet.apa.org/journals/amp/34/10/906.pdf

Fraivillig, J. L., Murphy, L. A., & Fuson, K. C. (1999). Advancing children's
mathematical thinking in everyday mathematics classrooms. Journal for
Research in Mathematics Education, 30(2), 148-170.

Hargis, C. (2005). Curriculum based assessment: A primer. Springfield, IL: Charles C
Thomas Publishing.

Hintze, J. M., Christ, T. J., & Methe, S. A. (2006). Curriculum-based assessment.
Psychology in the Schools, 43(1). doi: 10.1002/pits.20128

Hoard, C. E., & Clark, H. T. (1992). Self-regulatory behaviors in preschool children:
Fact or fantasy? Retrieved from http://www.eric.ed.gov/PDFS/ED353055.pdf

Hyson, M. (2008). Enthusiastic and engaged learners: Approaches to learning in the
early childhood classroom. New York, NY: Teachers College Press.

Hyson, M. C., Hirsh-Pasek, K., & Rescorla, L. (1990). The Classroom Practices
Inventory: An observation instrument based on NAEYC's guidelines for
developmentally appropriate practices for 4- and 5-year-old children. Early
Childhood Research Quarterly, 5(4), 475-494.

Idol, L., Nevin, A., & Paolucci-Whitcomb, P. (1986). Models of curriculum-based
assessment. Rockville, MD: Aspen Publishers.

Kostelnik, M. J., Soderman, A. K., & Whiren, A. P. (2007). Developmentally
appropriate curriculum: Best practices in early childhood education. Upper
Saddle River, NJ: Pearson Education, Inc.

Livingston, J. A. (2003). Metacognition: An overview. Retrieved from
http://eric.ed.gov/PDFS/ED474273.pdf

McLaughlin, M. W. (1990). The rand change agent study revisited: Macro
perspectives and micro realities. Educational Researcher, 19(9), 11-16.
Retrieved from http://www.jstor.org/stable/1176973

National Association for the Education of Young Children. (2011). All criteria
document. Retrieved from
http://www.naeyc.org/files/academy/file/AllCriteriaDocument.pdf

National Association for the Education of Young Children. (2009). Developmentally
appropriate practice in early childhood programs serving children. Retrieved
from http://www.naeyc.org/files/naeyc/file/positions/

position%20statement%20Web.pdf

National Association for the Education of Young Children, & National Association of Early Childhood Specialists in State Departments of Education. (2003). Early childhood curriculum, assessment, and program evaluation: Building an effective, accountable system in programs for children birth through age 8. Retrieved from http://www.naeyc.org/files/naeyc/file/positions/pscape.pdf

Pajares, F. (1996). Self-efficacy beliefs in academic settings. Review of Educational Research, 66(4), 543-578. Retrieved from http://des.emory.edu/mfp/PajaresSE1996.html

Pajares, F., & Urdan, T. (Ed.). (2006). Self-efficacy beliefs of adolescents. Greenwich, CT: Information Age Publishing.

Pintrich, P. R., Marx, R. W., & Boyle, R. A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. Review of Educational Research, 63(2), 167-199. Retrieved from http://www.jstor.org/stable/1170472

Reiser, B. J., Spillane, J. P., Steinmuller, F., Sorsa, D., Carney, K., & Kyza, E. (2000). Investigating the mutual adaptation process in teachers' design of technology-infused curricula. Fourth International Conference of the Learning Sciences, 342-349. Retrieved from www.umich.edu/~icls/proceedings/pdf/Reiser.pdf

Schwarzer, R. (Ed.). (1992). Self-efficacy: Thought control of action. United States: Hemisphere Publishing Corporation.

Seefeldt, C., & Wasik, B. A. (2006). Early education: Three-, four-, and five-year-olds go to school. Upper Saddle River, NJ: Pearson Education, Inc.

Snyder, J., Bolin, F., & Zumwalt, K. (1992). Curriculum implementation. In Jackson, P. W. (Ed.), Handbook of research on curriculum (pp. 402-434). New York, NY: MacMillan Publishing Company.

Solomon, P. G. (2003). The curriculum bridge: From standards to actual classroom practice. Thousand Oaks, CA: Corwin Press, Inc.

Spector, J. M. (2008). Handbook of research on educational communications and technology. New York, NY: Taylor & Francis Group.

Tobias, S., & Everson, H. (1995). Development and validation of an objective measure of metacognition. Retrived from http://www.eric.ed.gov/PDFS/ED383725.pdf

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. Retrieved from http://ils.unc.edu/~yanz/Content_analysis.pdf

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. Contemporary Educational Psychology, 25, 82-91. doi: 10.1006/ceps.1999.101

NAEYC ACCREDITATION CRITERIA

1.B.02:Teaching staff express warmth through behaviors such as physical affection, eye contact, tone of voice, and smiles.

1.B.04:Teaching staff encourage and recognize children's work and accomplishments.

1.B.15: Teaching staff talk frequently with children and listen to children with attention and respect.

2.A.06: The curriculum guides teachers to integrate assessment information with curriculum goals to support individualized learning.

2.B.04: Children have varied opportunities to develop a sense of competence and positive attitudes toward learning, such as persistence, engagement, curiosity, and mastery.

2.D.03:Children have varied opportunities to develop competence in verbal and non-verbal communication by responding to questions, communicating needs, thoughts, and experiences, and describing things and events.

3.B.03:Teaching staff develop individual relationships with children by providing care that is responsive, attentive, consistent, comforting, supportive, and culturally sensitive.

3.B.11:Teaching staff create a climate of mutual respect for children by being interested in their ideas, experiences, and products.

3.E.04:Teachers use their knowledge of individual children to modify strategies and materials to enhance children's learning.

3.E.09:Throughout the day, teaching staff actively seek out children's ideas and discern how they understand things by observing, talking with, and listening to them.

3.F.07:Teaching staff use varied vocabulary and engage in sustained conversations with children about their experiences.

3.G.07:Teachers use their knowledge of content to pose problems and ask questions that stimulate children's thinking. Teachers help children express their ideas and build on the meaning of their experiences.

3.G.10:Teaching staff join children in learning centers to extend and deepen children's learning. They observe children, engage children in conversations, and position themselves at eye-level with the children.

4.D.03:Teachers interact with children to assess their strengths and needs to inform curriculum development and individualize teaching.

4.D.07:Teachers talk and interact with individual children and encourage their use of language to inform assessment of children's strengths, interests, and needs.

6.B.01:All teaching staff evaluate and improve their own performance based on ongoing reflection and feedback from supervisors, peers, and families. They add to their knowledge and increase their ability to put knowledge into practice.

9.A.04:A variety of age- and developmentally-appropriate materials and equipment are available indoors and outdoors for children throughout the day. This equipment includes dramatic play equipment; sensory materials such as sand, water, play dough, paint, and blocks; materials that support curriculum goals and objectives in literacy, math, science, social studies, and other content areas; and gross motor equipment for activities such as pulling up; walking; climbing in, on, and over; moving through, around, and under; pushing; pulling; and riding.

CLASSROOM PRACTICES INVENTORY

The Classroom Practices Inventory:

An Observation Instrument based on NAEYC's Guidelines for Developmentally Appropriate

Practices for 4- and 5-year-old Children

Hyson, Hirsh-Pasek, Rescorla

School: _____ UD Laboratory Preschool _____ Age Group: ____4-year-olds_____

Date and Time Observed: September 28th, 8:45-10:00; October 5th, 8:45-10:30 (2011)

Activities/Periods Observed (list): Free reading; morning group; centers; clean-up; snack-time

Number of Children in Group: ____18_____ Number of Adults: ___3_____

After observing, rate each of the statements below, using the following scale:

1 = Not at all like this classroom

2 = Very little like this classroom

3 = Somewhat like this classroom

4 = Much like this classroom

5 = Very much like this classroom

Part I: Program/Activity Focus

1) Children select their own activities from among a variety of learning areas the teacher prepares, including dramatic play, blocks, science, math, games and puzzles, books, recordings, art, and music.   **5**

2) Large group, teacher directed instruction is used most of the time. Children are doing the same thing at the same time.   **1**

3) Children are involved in concrete, three-dimensional learning activities, with materials closely related to their daily life experiences.   **5**

4) The teacher tells the children exactly what they will do and when. The teacher expects the children to follow her plans.   **3**

5) Children are physically active in the classroom, choosing from activities the teacher has set up and spontaneously initiating many of their own activities.   **5**

6) Children work individually or in small, child-chosen groups most of the time. Different children are doing different things.   **5**

7) Children used workbooks, ditto sheets, flashcards, and other paper-and-pencil or two-dimensional learning materials.   **1**

8) Teachers ask questions that encourage children to give more than one right answer. **5**

9) Teachers expect children to sit down, watch, be quiet, and listen, or do paper and pencil tasks for major periods of time.   **1**

10) Reading and writing instruction emphasizes direct teaching of letter recognition, reciting the alphabet, coloring within the lines, and being instructed in the formation of letters.   **3**

11) Teachers use activities such as block building, measuring ingredients for cooking, woodworking, and drawing to help children learn concepts in math, science, and social studies.   **5**

12) Children have planned lessons in writing with pencils, coloring pre-drawn forms, tracing, or correct use of scissors. __3__

13) Children use a variety of art media, including easel and finger painting, and clay, in ways of their choosing. __5__

14) Teachers expect children to respond correctly with one right answer. Memorization and drill are emphasized. __1__

15) When teachers try to get children involved in activities, they do so by stimulating children's natural curiosity and interest. __5__

16) The classroom environment encourages children to listen to and read stories, dictate stories, notice print in use in the classroom, engage in dramatic play, and experiment with writing by drawing, copying, and inventing their own spelling. __5__

17) Art projects involve copying an adult-made model, coloring pre-drawn forms, finishing a project the teacher has started, or following other adult directions. __1__

18) Separate times or periods are set aside to learn materials in specific content areas such as math, science, or social studies. __1__

19) Children have daily opportunities to use pegboards, puzzles, legos, markers, scissors, or other similar materials in ways the children choose. __5__

20) When teachers try to get children involved in activities, they do so by requiring their participation, giving rewards, disapproving of failure to participate, etc. __1__

Part II: Emotional Climate (Answer primarily with reference to head teacher(s).)

1) Teachers show affections by smiling, touching, holding, and speaking to children at their eye level throughout the day, but especially at arrival and departure. __5__

2) The sound of the environment is marked by pleasant conversation, spontaneous laughter, and exclamations of excitement.   **5**

3) Teachers use competition, comparison, or criticism as guidance or discipline techniques.   **1**

4) Teachers talk about feelings. They encourage children to put their emotions and ideas into words.   **5**

5) The sound of the environment is characterized by harsh noise or enforced quiet.   **1**

6) Teachers use redirection, positive reinforcement, and encouragement as guidance or discipline techniques.   **5**

SUBJECT SELECTION FORM

Date: __9/9/11_____   Classroom: __Pre-K_____
Time: _8:45-10:25_____   Teacher: ___"Miss Kay"_____

Observation of arrival, free reading time, group time/circle time, activity time (centers), and clean-up

Name: *see file cabinet for real identification*
Gender: Male
Age: (5/23/07) – 51 months, 4.25 years old
Given Pseudonym: MARK

Characteristics of Interest for METACOGNITION:
 • An activity is set up with cars. Each toy car has a certain number of dots on it. The number of dots matches the number on one of the garages provided for the activity. Mark was working with the TA in the room:
     o Where does this go? (MARK)
     o Where do you think it goes? (TA)
     o I don't know. Does it go in here? (MARK)
     o No, why do you think it goes there? (TA)
     o It does. No? (MARK)
     o This one goes here! (MARK)
     o Did you count the dots? (TA)
     o *Points to dots, moves finger, no mouth motion*
     o It has 8 dots; do you see the number 8? (TA)
     o *Mark picks up a different car*
     o How many dots? (TA)
     o I don't know how to count (MARK)
     o *Mark walks away*

Characteristics of Interest for SELF-EFFICACY: • Mark left when he thought he could not do the cars   • Mark was working with another child in the writing center. The boy went to make a ticket for the Dramatic Play puppet show, but Mark said, "I have to do it. I can do it right. I can write. I have to write." He was very sure that he was capable in this domain.

Characteristics of Interest for APPROACHES TO LEARNING:
- In the group circle, Miss Kay led the children in body patterns, such as KNEE KNEE SHOULDER SHOULDER, KNEE KNEE SHOULDER SHOULDER. Mark tried the patterns at first, and was not successful. About halfway through the first pattern cycle, Mark stopped and just watched.
- In the second round of body patterns, Mark did not participate at all, from the beginning.
- Mark did not persevere at the cars activity; instead, he walked away after a second failure. However, I cannot be sure if his first wrong answer would be considered a failure in Mark's mind, for he did not seem to grasp the fact that the answer was incorrect right away.

Further Notes:
- From arrival into group time, Mark watches other children but tends to stand back.
- When Miss Kay was asking the children to each say, "Hi, my name is…", Mark would not speak, even after multiple prompting. (Limited verbal expression in certain scenarios, particularly group situations?)
- Mark went directly to Dramatic Play as soon as centers were opened.
- Mark shows creativity in the dramatic play center; he took a frog puppet and initiated a puppet show, even when the 'stage' was not accessible to him and had to be requested. During the puppet show, he said, "I am the frog of evil!" For his play, he created his own tickets in the writing center. He gave one to Miss Kay. When she asked him what the ticket said on it, he gave a long explanation with great detail, including the fact that the show began at 4:41.
- Mark seems to be less verbal with the other children and the teacher. He seems more physical in his interactions.

Input from Cooperating Teacher:
- This is Mark's third year at the Lab Preschool, so he is very experienced with the research process and with meeting new adults. He has an "excitement for language," although he is often quiet in terms of speaking, and he often initiates reading and requests books for the class to listen to. Miss Kay believes that to take part in this research would help him to stretch his cognitive abilities, which are quite promising.
- Mark has a new-found sense of independence; in his past years, he has been a 'follower' of others, but this year, he has come to be more independent.

Date of Parental Consent Form Distribution: 9/9/11

Date of Parental Consent Form Receipt: 9/9/11

Date of Completed Child Verbal Assent: 9/14/11

Appendix D

IRB APPROVAL LETTER

RESEARCH OFFICE

210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: August 23, 2011

TO: Rebecca Godwin
FROM: University of Delaware IRB

STUDY TITLE: [242371-2] Awareness of Metacognition, Self-Efficacy, and Approaches to
Learning in the Early Childhood Classroom

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED

APPROVAL DATE: August 23, 2011
EXPIRATION DATE: June 6, 2012
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of Amendment/Modification materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office. Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Jody-Lynn Berg at (302) 831-1119 or jlberg@udel.edu. Please include your study title and reference number in all correspondence with this office.

DAILY ANALYSIS TEMPLATE

DAILY ANALYSIS FORM:
Date: _____9-23-2011_____
**information / proof taken from 9-23-2011 transcription

Pseudonym: *PAIGE*	*Where is the proof?*
<u>**What do I know about this child and METACOGNITION?**</u> • Paige is very aware of how she can utilize her brain's actions and abilities • She understands that her mind's actions lead to her own actions • She has a specific method for engaging in thought, and a specific explanation for how her thinking processes occur • She can describe what she is thinking about • She understands that *she* controls her brain • She understands that others think separately from her, in unique ways	 • Lines 10-17 • Lines 41-46 • Lines 104-109 • Lines 117-121 • Lines 122-128 • Lines 113, 122
<u>**What do I know about this child and SELF-EFFICACY?**</u> • Paige naturally applies her previous and/or current knowledge of her abilities to a given task to see if she can be successful at it • She connects effort to success and to failure in a realistic manner—not idealized • She believes that she can use her brain to come up with ways to be successful at a given task • She says that she will keep trying when she cannot do something, because she knows that if she keeps trying, she can probably be successful	 • Lines 10-17 • Lines 35-41 • Lines 41-46 • Lines 35-46
<u>**What do I still need to find out?**</u> • Does Paige feel frustration when faced with failure	 ----------------------

repeatedly, or does she continue to remain positive? • Are there areas of the classroom, or subject domains, in which her approaches to tasks are not consistently positive and confident?	
How could this knowledge assist the classroom teacher? • Paige knows that she controls her brain, so she could be supported to build strategies for thought processes, increasing her success in the classroom • The teacher would be aware that if he/she presented Paige with a significant challenge, Paige possesses attitudes which would most likely encourage her to persevere and create strong metacognitive connections to her failures and her successes.	----------------------
Key phrases/situations that elicited useful data: • "How do you feel when you try something really hard and can't do it?" • "If you try something hard and you can't do it, do you give up?" • "How did you make your brain remember all of this?" (PAUSE) "How did your brain know this?" • "What are you thinking about?" • "Can you tell your brain what to think about?"	• Lines 35-40 • Lines 41-44 • Lines 104-110 • Lines 117-121 • Lines 123-128
How could today's activity be embedded into the curriculum through CBA? • In various activities, these questions could be used as a reinforcement method: "Wow! You remembered so much! How did your brain know ALL of this?!" • A class "game" could be utilized: "Stop! What is your brain thinking about right now? • To make children focus on something, ask the children to make their brain think about _____. This incorporates metacognition awareness, as well as the awareness of increasing ability through thought processes	----------------------

Appendix F

METACOGNITION ELICITATION PHRASES

Successful Elicitation Phrases for Metacognition

Some phrases are open-ended and some are close-ended.

Successful use requires the tying-together of both types of questions.

Close-ended provokes thought.

Open-ended invites those thoughts to be expressed.

- How do you think?
    - What do you use to think about things?
- How did you remember that?
    - How did your brain know that all the way until now?
    - How did you make your brain remember all of this?
    - How did your brain know this?
- What are you thinking about right now?
    - Can you tell me what you're thinking about now?
- Why are you thinking about…?
    - Why is your brain thinking about…?
- Can you tell your brain what to think about?
    - Does your brain think about things even if you don't tell it to?
    - Do we have to tell our brains to think about something?

- How do you know that…?
  - How does your brain know that…?
- What does your brain do?
  - Do you know what your brain does?
- What does your brain think about?
  - What do you think about in your brain?
- What does my brain think about?
  - What do you think I think about in my brain?
  - What does his/her brain think about?
- Do we all think about the same things?
  - Do our brains think about the same things?
- Can we try to think about…?
  - Can we make our brains think about…?
- Do you see the …… in your brain?
  - Are you thinking about…?
- How are you thinking about…?
  - How is your brain thinking about…?
- What is something that you know?
  - What is something that your brain knows?
  - What is something that your brain does NOT know?
- How do you know that?

  **This can be used as a probe for ANY answer to the questions above

Appendix G

SELF-EFFICACY ELICITATION PHRASES

Successful Elicitation Phrases for Self-Efficacy

Some phrases are open-ended and some are close-ended.

Successful use requires the tying-together of both types of questions.

Close-ended provokes thought.

Open-ended invites those thoughts to be expressed.

- Can you…? (walk, fly, think, etc… Can be filled in with anything pertaining to current task as well)
  - How do you know?
- How do you feel when you try something really hard and can't do it?
  - How do you feel when you can't do something that's really hard?
  - How do you feel when you can't do something?
    - What do you do when you feel…?
- If you try something hard and you can't do it, do you give up?
  - If you can't do something, do you give up?
  - Do you ever give up sometimes?
    - Why/why not?
- Do you think you would get it right if you tried it again?
  - Should we try it again?

- ▪ Why/why not?
- • How do you know that you can/can't…?
- • Do you think that you can get better at…?
  - o Why/why not?
- • How does it feel to do something this hard?
  - o Is this hard? Is this easy?
- • What is something that is hard for you to do?
  - o What is something that is easy for you to do?
  - o Is this hard to do?
  - o Is this easy to do?
    - ▪ How do you know?

Appendix H

STRUCTURAL THEMES FOR ELICITATION

14 Teacher Strategies for the Conversational Context of Elicitation

1) **OBSERVING**

   - Watching and listening for a moment in which the child can be effectively engaged in elicitation.

     o All elicitation strategies are inapplicable without observation.

     o This is a continuous process through which teachers decide when and where to apply the strategies, and the best way to apply them.

   - Effective moments include:

     o Instances when a child…

       ▪ *METACOGNITION*: Draws a conclusion; expresses knowledge; makes a decision or choice; remembers something; says "I think"

       ▪ *SELF-EFFICACY*: Attempts / declines a task; is presented with a new task; expresses an inability / ability; states the difficulty / ease of a task; mentions something they have / have not done

2) **ENTERING THE THOUGHT STREAM**

   - Entering the context without causing interruption of meaning or disturbing a child's train of thought/activity.

     o Imagine entering a stream without forming a ripple in the water. That is the goal. Entering is the stage in which the teacher figure slides into the

naturally occurring 'stream' of thought and begins to draw out the information that is available in the context. This entering is reoccurring—it occurs when the teacher first enters the context, and as the teacher moves throughout the context by utilizing the various strategies.

3) **REQUESTING INFORMATION:** *Strategies which directly prompt the child to provide information.*

- QUESTIONING
  - Presenting children with a new question.
    - These questions can be open-ended or close-ended. The connecting factor is simply that the questions prompt the child to form a response of some sort regarding a novel concept.
      - *Example: How did you know that it was the rabbit?*

- REPHRASING
  - Forming an alternate way to present a question.
    - This should be used if the child is not responding to the original question. Rephrasing helps children think about the same question content in a different way.
      - *Example: How did you remember that the rabbit came first?*

- PROBING
  - Questioning that delves further into the original question or past the original question.

- Probes connect back to the original question in content. They either continue the line of questioning about the particular topic, or go deeper into the topic.
  - *Example: What did you <u>use</u> to think about the rabbit?*
- CLARIFYING
  - Asking children to repeat a response or to explain a response if the response is originally unclear.
    - If the teacher does not comprehend the words that a child has spoken, whether due to speech or to content, he or she should utilize clarifying in order to understand the child's intended response. The teacher should not pretend to understand or provide vague responses. This interrupts the use of effective transitioning and halts the collecting of relevant information.
      - *Example: How does that work?*

4) **RESPECTING THE CHILD:** *<u>Strategies which provide an effective setting for the child to provide information.</u>*

- ALLOWING TIME
  - Pausing after requesting information to allow the child to think and respond without pressure.
    - Allowing is a very social-based construct in that the length of allowance depends on the child, the teacher, and the relationship between the two. There is no set length of time that a teacher should wait for a response. Overall, be sure to give the child

sufficient time to think, but if the child seems to be stuck, move on to the next method.

- REPEATING TO PAUSE
  - Saying the child's answer back to them after they respond with the purpose of focusing on the response.
    - This may take the form of a question or a statement. This form of repeating allows the child to hear his or her ideas spoken by the teacher, so that the conversation pauses and time is dedicated to considering the ideas. This allows the child to hear the idea in a legitimate form, and to consequently consider the idea more closely.

- REPEATING TO SHOW ATTENTION
  - Saying the child's answer back to them after they respond with the purpose of demonstrating that the child is being heard.
    - This may take the form of a question or a statement. This repeating shows the child that the teacher has been listening closely and finds the child's words significant and worth attention.

- SHOWING APPRECIATION
  - Showing excitement and admiration for the child's answers.
    - This can occur in many forms. Phrases such as "Alright!" "Oh!" "Hmm" and "Wow!" are reactive strategies, for they show a positive, thoughtful reaction to the words of the child. Some forms are more explicit, using phrases such as "That makes

sense!" or "What a thoughtful answer." Other appreciation forms appear to be evaluations, such as "You're right!" or "That's close!" However, the purpose of these phrases is not to inform the child of his or her level of correctness; instead, they are intended to create a sense of competence. In any form, the teacher is telling the child, "I find what you say to be interesting, thought-provoking, and valuable."

5) **PROVIDING INFORMATION:** *Strategies which supply children with information that is required for the setting or the conversation to continue with meaning.*

- INFORMING
  - Directly giving the child factual information about any relevant topic.
    - At times, the child explicitly asks the teacher a question, or a teacher needs to tell a child something specifically about a task or concept. In these cases, it is okay for the teacher to provide information. The child will use this information to form ideas worth eliciting.
      - *Example: Today, we're going to read a story. I need you to try to remember the order of the characters in the story.*

- NARRATING
  - Verbally commenting on the actions of the child, actions which the child has not spoken about.
    - This provides a verbal connection to the actions of the child, allowing the child to conceptualize what he or she just did. The

teacher needs to use this strategy directly after an important action occurs that should be brought to the child's conscious attention.

- *Example: You just switched the deer and the duck in your order.*

- REFLECTING
  - Bringing multiple, past ideas together and presenting them in the current context.
    - Reflecting allows the teacher to bring past conclusions or occurrences into the child's current view, continuing the momentum of the earlier actions and expressions and organizing them into connecting concepts.
      - *Example: The first time, we didn't get the order right. But then, you wanted to try again!*

- MODELING
  - Providing a structure or example—through words, verbally expressed thoughts, and actions—which can be utilized by the child in similar circumstances.
    - The model should be age appropriate. The child should be able to understand and apply the same words, thoughts, and actions. Modeling should occur frequently and repetitively.
      - *Example: I don't think that my brain remembers who came next. I wonder how I could help my brain remember.*

Appendix I

INITIAL INTERVIEW EXAMPLE

1) How capable do you think that 4-year-old children are at monitoring their thinking processes?

   - I think that typically-developing 4-year-olds are capable of doing so. I think that they need directions, or they need specific teaching to do so, though… just as they need teaching to know how to line up, or to know how to put their books back on the shelf. They need, if you will, the hidden curriculum, or the thinking behind why you're doing what you're doing. So it can't just be assumed that they know how to do it.

2) And how capable do you think that 4-year-old children are at determining their abilities realistically?

   - I think that 4-year-olds tend to do what they want to do, if that makes sense. Versus really exploring all areas of curriculum independently. So I don't know that they can truly monitor their abilities and work on their abilities without support from teachers.

3) And how capable do you think that they are of verbally expressing their thinking process and their abilities?

   - Oh they're very verbal; 4-year-olds love to talk, a lot!

4) If you had to get a child of this age to talk about how their thinking works, what would you say to them, or how would you engage in that conversation?

- Well, I think in whole-group settings, it's challenging, because you ask a question and then the ones that have faster processing speeds are oftentimes the ones who answer the questions. So not only large group but small group, and independent work, so you can really arrive at what is comfortable for each child, because they are so very different. And I think that just really offering them a wide array of activities that can provide appropriate challenges, so that you can really get them to think, because if it's not challenging for them, then they're not really going to be thinking.

5) How conscious are you of that aspect of your curriculum? Do you have specific times that you try to make them think about their thinking?

- I've been working a lot on the concept of flexible brains with the social curriculum. So thinking about really being creative with how we interact with our peers, or how we treat one another. So I think in regards to that part of my curriculum, I am very aware of their thinking, and in terms of how, or, I am very good at getting them to think about their thinking, I should say. In terms of, you know, why did that happen, how did so-and-so feel, and why did they say that, and why did that happen, and those types of questions. I think when it comes to other areas, I don't think I go beyond in terms of why they're thinking what they're thinking, because I am pretty close-minded, with my special education background, in terms of 'we are working on this skill and I need to have you achieve this skill.' So I think depending on the area, I'm very different. But I'm excited to grow and ask them questions about it in those other areas!

Appendix J

FINALIZED IMPLEMENTATION SUPPORTS

Self-Efficacy: *ERICA*	
ELICITATION PHRASE/REPHRASE	*NOTES ON RESULT*
Can you…? • Are you able to…? *REPEAT THEIR ANSWER…* • How do you know? • Have you tried before?	I asked, "Can you build a house?" in the block center: • "Yes, we took a block from Charles and then we can" • "I took a lot of blocks and then I built it" • "No, there are no blocks left."
How do you feel when you try something really hard and can't do it? • How do you feel when you can't do something that's really hard? *REPEAT THEIR ANSWER…* • How do you know? • What do you do when you feel…?	In the block center: • Joanna: "Sad, because I'm not BIG enough!" • Marty: "I can do it, so I'm happy!" • Paige: "I feel a little tired, because it was hard, and sad." • Alexa: "Sleepy! I fell asleep when I build hard things." • Chris: "Things are a little hard but a little not hard."
How do you know that you can/can't…? • How does your brain know that you can/can't…? *REPEAT THEIR ANSWER…* • Why can/can't you do that?	In the block center: • Michelle: "I used my brain. It knows how to build a house."

How does it feel to do something this hard? • Is this hard to do? • Is this easy to do? *REPEAT THEIR ANSWER…* • What should you do when you feel…?	*Not used today*
Do you think you would get it right if you tried again? • Should we try it again? • What would happen if you tried it again? *REPEAT THEIR ANSWER…* • Why/why not?	*This took a few tries. I had to use the rephrasing questions.* In the block center: • Nora: "I would get a lot of exercise." • Chris: "If all 3 kids build together, then we can use 3 brains, and the brains can do it so we can do it."
What is something that is hard for you to do? • What is something that is easy for you to do? *REPEAT THEIR ANSWER…* • How do you know? • Is this easy to do? • Is this hard to do?	*Not used today*

Appendix K

CLOSING INTERVIEW EXAMPLE

1) How capable do you think that 4-year-old children are at monitoring their thinking? (metacognition)
    - Very capable! They are able to talk about the process of thinking and clearly verbalize their thoughts! They surprised me! ☺
2) How capable do you think they are at determining their abilities realistically? (self-efficacy)
    - Depending on the child's self esteem and experience with the task you are asking them to complete, they are very capable! I think that family background impacts this too-how much reinforcement do they receive?
3) How capable do you think they are at verbally expressing their thinking processes and their abilities?
    - They are very good at talking about their thinking when you give them the time to do so. You have to believe that they are capable!
4) If you had to get a child of this age to talk about how their thinking works, how would you engage in the conversation? To talk about their abilities?
    - I would probably make sure we are in a quiet area, and then I would ask- How did you know that? How did you figure that out? Give them time! I think just asking them- What do you use when you are thinking? How do you think?

5) How conscious are you of a child's thinking about their thinking? Do you ever specifically try to make them think about their thinking?

- Yes! Especially during group time – science experiments – approaching new tasks. Prior to this, I would tell them to turn on their "thinking caps" – now I steer away from that statement and refer more to the children – give them the opportunity to answer – What did you use to find that answer? Or, what should we use as we are experimenting? Yes, your brain!

Appendix L

SIMPLIFIED STRUCTURAL THEMES FOR ELICITATION

WAYS TO TALK ABOUT THINKING AND ABILITIES:

14 Strategies that You Can Use

1) **OBSERVING**

- *Observing* is finding a good time to start a conversation with children about their thinking or about their abilities. Teachers need to decide when these conversations will be successful by watching and listening for an appropriate time to start.
    - *Examples can be found at the top of our model*

2) **ENTERING THE THOUGHT STREAM**

- *Entering the thought stream* is finding a way to enter into the thoughts of a child without interrupting those thoughts.
    - Imagine entering a stream without forming a ripple in the water. That is the goal. We need to slide into the child's 'stream of thought' and start to draw out the information from the stream. This entering happens again and again—it happens when the teacher first enters into a conversation with a child, and then happens each time that the teacher moves throughout the thought stream.
        - Use *observing* to enter the thought stream successfully

3) **REQUESTING INFORMATION:** <u>Strategies which directly cause the child to provide information.</u>

- QUESTIONING
  - *Questioning* is simply asking a child a new question. The question prompts the child to form a response about a new concept.
    - *Example: How did you know that it was the rabbit?*

- REPHRASING
  - *Rephrasing* is asking a question in a different way. This is used when the child isn't answering the original question. Rephrasing helps children think about the same question in a different way.
    - *Example: How did you remember that the rabbit came first?*

- PROBING
  - *Probing* is asking questions that go deeper into the original question or go past the original question. These probing questions relate to the original question in terms of content.
    - *Example: What did you <u>use</u> to think about the rabbit?*

- CLARIFYING
  - *Clarifying* is asking children to repeat a response or to explain a response if the meaning is unclear. Sometimes, the teacher can't understand the child's words, or sometimes it's hard to tell what the child means. The teacher should not pretend to understand. Instead, they should clarify.
    - *Example: How does that work?*

4) **RESPECTING THE CHILD:** <u>Strategies which help the child feel comfortable and able to respond.</u>

- ALLOWING TIME

  - *Allowing time* is pausing after requesting information to allow the child to think and respond without pressure.

- REPEATING TO PAUSE

  - *Repeating to pause* is saying the child's answer back to them after they respond in order to focus on their response. This can be a question or a statement. Having the teacher repeat the child's response pauses the conversation so that the ideas are really considered closely.

- REPEATING TO SHOW ATTENTION

  - *Repeating to show attention* is saying the child's answer back to them after they respond in order to show that the child is being heard. This can be a question or a statement. It shows the child that the teacher thinks that his or her ideas are worth attention.

- SHOWING APPRECIATION

  - *Showing appreciation* is showing excitement and admiration for the answers that the child provides.

    - "Alright!" "Oh!" and "Wow!" show a positive, thoughtful reaction to the words of the child. "That makes sense!" or "What a thoughtful answer" show the child that his or her responses are worth something.

      a. In any form, the teacher is telling the child: "I find what you say to be interesting, thought-provoking, and valuable. I appreciate what you are telling me."

5) **PROVIDING INFORMATION:** <u>Strategies which give children enough</u>
<u>information to continue a meaningful conversation.</u>

- INFORMING
  - *Informing* is directly giving the child factual information about the topic at hand. Sometimes, the child will ask for the information, or other times, the teacher thinks that the information will help the child understand the task.
    - *Example: Today, we're going to read a story. I need you to try to remember the order of the characters in the story.*
- NARRATING
  - *Narrating* is verbally commenting on important actions of the child. This helps the child to really think about what he or she just did.
    - *Example: You just switched the deer and the duck in your order.*
- REFLECTING
  - *Reflecting* is bringing different, past ideas together and talking about them in the current situation. This helps the child remember important earlier ideas.
    - *Example: The first time, we didn't get the order right. But then, you wanted to try again!*
- MODELING
  - *Modeling* is giving the child a structure, or example—through words, thoughts, and actions—which can be used by the child in similar situations. The model should be age-appropriate, so that the child can

understand and use the same words, thoughts, and actions. This should happen often.

- *Example: I don't think that my brain remembers who came next. I wonder how I could help my brain remember.*

Appendix M

SIMPLIFIED METACOGNITION CHART

Ways to Talk about Thinking: Metacognition

Use this chart, which provides multiple ways to present and to probe into questions, to

speak with children about how they see their thinking and to record their responses.

QUESTION	NOTES
How did you remember that? • How did your brain know that? *REPEAT THEIR ANSWER…* • How did it think about that? • How did it do that?	
What are you thinking about right now? • What is your brain thinking about right now? *REPEAT THEIR ANSWER…* • How do you know? • How can you tell?	

<u>Can you tell your brain what to think about?</u>
   • Can you make your brain think about something?
REPEAT THEIR ANSWER…
   • How do you do that?
   • Do you HAVE to tell your brain to think about it?	

<u>How do you know that…?</u>
   • How does your brain know that…?
REPEAT THEIR ANSWER…
   • Are you thinking about ____ now? How?	

<u>What does your brain do?</u>
   • How do you use your brain?
REPEAT THEIR ANSWER…
   • How do you know?	

<u>What does your brain think about?</u>
   • What things do you think about in your brain?
REPEAT THEIR ANSWER…
   • How do you know?
   • Why does it think about …?
   • What does my brain think about? His/her brain?	

<u>Can you try to think about…?</u>
   • Can we make our brains think about…?
REPEAT THEIR ANSWER…
   • How do we do that?
   • Are you thinking about…?
   • How do you know?	

<u>How are you thinking about…?</u>
   • How is your brain thinking about…?
REPEAT THEIR ANSWER…
   • How is your brain doing that?
   • How do you know?	

<u>What is something that your brain knows?</u>
   • What is something you know?
REPEAT THEIR ANSWER…
   • How can you tell that your brain knows that?
   • How do you know?
   • How does your brain know that?	

Appendix N

SIMPLIFIED SELF-EFFICACY CHART

Ways to Talk about Ability: Self-Efficacy

Use this chart, which provides multiple ways to present and to probe into questions, to speak with children about how they see their abilities and to record their responses.

QUESTION	NOTES
Can you…? • Are you able to…? *REPEAT THEIR ANSWER…* • How do you know? • Have you tried before?	
How do you feel when you try something really hard and can't do it? • How do you feel when you can't do something that's really hard? *REPEAT THEIR ANSWER…* • How do you know? • What do you do when you feel…?	

<u>If you can't do something, do you give up?</u>
   • Do you ever give up sometimes?
REPEAT THEIR ANSWER…
   • Why do you think you give up?
   • What makes you keep trying?	

<u>Do you think you would get it right if you tried again?</u>
   • Should we try it again?
   • What would happen if you tried it again?
REPEAT THEIR ANSWER…
   • Why/why not?	

<u>How do you know that you can/can't…?</u>
   • How does your brain know that you can/can't…?
REPEAT THEIR ANSWER…
   • Why can/can't you do that?	

<u>Do you think that you could get better at…?</u>
   • Is there a way that you could get better at…?
REPEAT THEIR ANSWER…
   • Why can/can't you get better?
   • How could you get better?	

<u>How does it feel to do something this hard?</u>
    • Is this hard to do?
    • Is this easy to do?
REPEAT THEIR ANSWER…
    • What should you do when you feel…?
    • What do you do when you feel…?	

<u>What is something that is hard for you to do?</u>
    • What is something that is easy for you to do?
REPEAT THEIR ANSWER…
    • How do you know?
    • Is this easy to do?
    • Is this hard to do?	

Appendix O

PERSONALIZATION TEMPLATE

<u>Make Your Own!</u>

Use this chart template to fill in the questions that you can see yourself using in your

classroom.

<u>QUESTION</u>	<u>NOTES</u>

Appendix P

SIMPLIFIED ANALYSIS TEMPLATE

<u>A Chart for Each Child</u>

Here's a quick way to keep track of what you have learned about each child, and to

remind yourself how you can use what you have learned!

Name: _____   Date: _____

<u>Question:</u>	<u>*How do I know?*</u> <u>*(Where is the proof?)*</u>
<u>What do I know so far about this child's thinking /</u> <u>metacognition?</u>	
<u>What do I know so far about this child's view of</u> <u>abilities / self-efficacy?</u>	

<u>What do I still need to find out about this child?</u>	
<u>How could this help me as this child's teacher? How could I use this knowledge in my classroom?</u>	
<u>What really worked? What specifically did I do that let me find out this information?</u>	