STRUCTURED PLAY AND STUDENT LEARNING IN KINDERGARTEN: AN OUTCOME EVALUATION

A thesis report presented

by

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to

The School of Education

In partial fulfillment of the requirements for the degree of

Doctor of Education

In the field of

Educational Leadership

College of Professional Studies

Northeastern University

Boston, Massachusetts

January 2012
Abstract

Structured Play and Student Learning in Kindergarten: An Outcome Evaluation

This qualitative research study was an outcome evaluation of an alternative kindergarten curriculum to those currently used in most public schools. Tools of the Mind, a Vygotskian, play-based curriculum was implemented during the 2010-2011 school year in four kindergarten classrooms, involving data from approximately 50 students, within a public school district located in a rural, coastal region of New England.

The following three research questions were investigated in this study:

1. How does the Tools of the Mind curriculum develop students’ literacy skills and understandings through play?
2. How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented? and
3. How do students who have experienced the Tools curriculum perform on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS)?

This methodology used was a qualitative, five-step protocol (University of Wisconsin, Madison, Cooperative Extension Campus) to assess the interplay of the intended, the enacted, and the attained curriculum (Marzano, 2003). The Tools of the Mind curriculum was analyzed, the teachers were surveyed about their implementation fidelity, and student DIBELS data was analyzed. This study used the teacher survey responses and the student DIBELS data, to design questions used in follow up interviews with teachers and the early childhood director. The responses to these interview questions created the depth of detail needed to understand the
impact of the curriculum on student learning outcomes and the teachers’ professional
dispositions about teaching kindergarten.

The study findings provide educational policy makers, public school leaders, and
classroom teachers with another example of a way to alter their current kindergarten
environment if they so choose.

Keywords: kindergarten learning, play-based curriculum, early childhood classroom,
academic achievement, DIBELS
Acknowledgements

“It is good to have an end to journey toward; but it is the journey that matters, in the end”
-- Ursula K. LeGuin, n.d.

I ran the Boston Marathon about 10 years ago. Prior to starting my training, I imagined that completing that race would be an accomplishment that would change me forever. What I didn’t know was when I would cross the finish line on Boylston Street, the joy and satisfaction in running 26.2 miles was profoundly rooted in the months of training that led up to that moment. Ultimately, it was not the end but the journey getting there that was most meaningful to me. In many ways, earning this doctorate has been a similar experience. As it was good to be finished with the Boston Marathon, it is good to be finished with my doctorate. The joy and the satisfaction in this accomplishment would not have been possible without some very important people who provided instruction, coaching, guidance, and support on this profound personal and professional journey.

With the deepest of heartfelt gratitude, I thank my advisor Dr. Margaret Dougherty, my second reader, Dr. Alan Stoskopf, and my external reader, Dr. Andrea Martone. In addition, I am indebted to Dr. Charles Depascale, Barb Wilder-Smith, and Elizabeth McGonagle for their support. In their respective fields, all these people are exceptional. I am keenly aware of how fortunate I have been to work with and learn from them.

My mom and dad, Maryanne and J. Thomas Smith, were my first teachers and role models for the importance of education. Both of them have had an immeasurable influence on who I am, what I value, and my belief that it is the journey that matters. Their love and support have always been a constant in my life. So too has been the emotional and moral support of my sisters, Megan and Shana. Their friendship, love, and belief in me were, and will always be, a source of strength, comfort and inspiration.
Finally, there are not words adequate enough to thank my husband, Mark, for his unconditional support in the pursuit of all of my dreams and aspirations. His love, and the love of my two beautiful and amazing children, Flynn and Nuala, has sustained me on this journey. Flynn was entering kindergarten when I started my doctoral studies and Nuala is in kindergarten as I finish. My passion for this study had a great deal to do with my interest in their early learning experiences. My love for them, and being their mother, give my life’s journey its true north.
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Chapter 1: Structured Play and Kindergarten Student Learning: An Outcome Evaluation

This study was an outcome evaluation of one district’s implementation of the Vygotskyian, play-based Tools of the Mind curriculum and the kindergarten student learning outcomes as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) of students who experienced this curriculum. This study contributes to the existing research about early childhood learning in that it examined a comprehensive curriculum that approaches kindergarten learning through a social-emotional, child-centered approach and provided data on how these students performed on the tests given as part of the DIBELS battery. The results of this study also contribute to the body of research from which school and district decision makers can draw to make curricular plans for their youngest students. Finally, from a practical standpoint, this study provides a model for districts that are interested in conducting their own outcome evaluations.

The Problem and Its Significance

The current era of educational reform, dating to the early 1980s, has been dominated by “excellence concerns” (Brint, 2006, p. 278). Accompanying these concerns has been the introduction of accountability measures throughout public school systems (Brint). In 1994, the federal government began to build on state efforts to mandate accountability assessments by “requiring such assessments as a precondition for federal funds” (Brint, p. 260). The movement toward greater accountability for student performance culminated in the federal government’s No Child Left Behind Act (NCLBA) of 2001. Under the NCLBA, each state established a definition of adequate yearly progress (AYP) to use each year to determine the achievement of each school district and school. The definition of AYP is based on expectations for growth in student achievement that is continuous and substantial, such that all students are proficient in
reading and math no later than 2013-2014 (NCLBA, Sections 1111(b)(2)(C)(iii), 1111(b)(2)(F), and 1111(b)(2)(H).). The definition of AYP is based primarily on the state's academic assessments in reading/language arts and math. (NCLBA, Section 1111(b)(2)(C)(iv); Section 1111(b)(2)(G)(i)). States begin testing at grade 3 in both content areas. Although kindergarten is not specifically addressed in the NCLBA, “the general public considers kindergarten as a standard beginning year of the American K–12 education system” and as such, it is the initiation into the educational accountability system (Kauerz, 2005).

With the advent of full day-kindergarten and concern for closing achievement gaps of children who are low income and/or from minority backgrounds, the emphasis on curriculum foundations for later school success has taken center stage. New research suggests that in some major metropolitan areas on both United States coasts, the NCLBA and the need to meet future AYP targets are driving an increased emphasis on academic skills, particularly in relation to literacy and numeracy (Miller & Almon, 2009). The research has documented that in these specific instances, it has replaced child-centered, experiential, inquiry-based learning activities (Miller & Almon). The main methodology for teaching in this new environment is skill-based, teacher-directed curricula. Increasingly, standardized testing is being used to measure a child’s achievement, and to determine learning deficits (Miller & Almon).

One challenge that confronts educators and policy-makers when looking at the efficacy of this academically focused approach to kindergarten is that there is no research that immediately supports it. Additionally, there is no research that suggests that a kindergarten learning environment that is student-centered, focused on play and the development of social skills is incompatible with reaching grade-level learning goals. Because kindergarten is often the foundational experience for future learning, the methodology that is used to teach children at this grade level sets the stage for learning and student behavior in later grades. Is a political initiative
connected to federal and state school funding mechanisms driving changes to kindergarten that are not research-based?

**Significance of the problem.** Most adults remember kindergarten as a time of play and transition from home to school. Nevertheless, kindergarten today is more structured and likely follows one or more years in which children have been in a group setting at preschool. In addition, researchers are caught up in the puzzle of defining kindergarten. Pointing to the variability in policies and a lack of research on specific classroom practice, scholars of kindergarten highlight its muddled image (McMaken 2001; Vecchiotti, 2001; West, Denton, and Geronimo-Hausken, 2000; West, Denton, & Reaney, 2001). Vecchiotti (2001) suggests, “kindergarten suffers from the middle-child syndrome, caught between early education and public education, because it shares features of both educational levels” (p. 6).

The use of pedagogical approaches that emphasize academic skills at the exclusion of play-based learning is an issue that is being grappled with not only by underperforming school districts, but districts that are solid socio-economically middle class. In this researcher’s district, which is middle-class, kindergarten has been included as the foundational year during which academic skills are taught. The daily schedule is very similar to the rest of the elementary grade levels. The kindergarten curriculum is a highly scripted, teacher-directed core literacy series, as well as a scripted process writing program. Additionally, standardized assessments and progress monitoring initiatives have been established as means to identify, as early as possible, those students who are having difficulty learning to read. From a data-driven instructional model perspective, this is positive news. However, this news is counter balanced by teacher reports of the “pressure-cooker” classroom environment resulting from insufficient time for what is characterized as “developmentally appropriate learning,” and specifically play-based activities (Hartigan, 2009).
Research Questions

Three research questions were explored in this study: (1) How does the Tools of the Mind curriculum develop student literacy skills and understandings through play? (2) How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented? And (3) How do students who have experienced the Tools curriculum perform on the DIBELS?

Theoretical Framework

Two theoretical frameworks are used in the investigation into this problem of practice. The first is the Vygotskian interpretation of constructivism. Russian psychologist Lev Vygotsky’s (1967) socio-cultural approach to understanding how cognitive skills and learning are developed in children provides an intellectual lens through which to view the nature of this problem. The second is Robert J. Marzano’s (2003) theory that provides a lens through which the interplay of the curriculum, the fidelity of implementation, and student learning outcomes can be viewed. Marzano’s framework for understanding the dynamics of learning in public schools operationalizes Vygotsky’s theory for how children learn best.

Vygotsky’s perspective. Vygotsky (1962) believed that conflict promotes cognitive development. The child learns when there is a new, different, or conflicting concept encountered through a social interaction and is reconciled with what the child already knows. A child goes through a process of constructing his or her own version of a new concept or skill, influenced by that child’s background knowledge. Constructivism means actively creating a personal approximation of a learning task. With successive attempts at learning the new skill or concepts, combined with feedback from the teacher or “expert other,” the learner eventually constructs a version of that skill that is like the teacher’s or the expert’s.
**Zone of Proximal Development (ZPD).** For Vygotskians, the learning experience is most effective when it takes place within the individual learner’s zone of proximal development, or ZPD. Vygotsky conceived that children’s development is a continuum of behaviors or degrees of maturation. The word zone reflects this idea. Proximal describes the behaviors that are closest to emergence at a specific time. In this way, the ZPD contains those skills, concepts, or knowledge that are on the edge of emergence. The lower boundary of the ZPD defines the child’s level of independent performance. The upper boundary is the maximum the child is capable of doing when given the maximal amount of help by a more knowledgeable other, such as a teacher. Between these two boundaries are varying degrees of partially assisted performances (Bodrova & Leong, 2007).

**Play and early childhood.** Vygotsky’s co-constructed learning and zone of proximal development are pivotal to understanding the nature of children’s knowledge construction and play-based learning that will lead to the development of cognition. Vygotsky believed that play was critical during the early childhood years. However, not all play resulted in the same social-emotional and intellectual growth. Structured play, from a Vygotskian perspective, creates a zone of proximal development. When learning occurs within a child’s zone of proximal development it encourages and advances a student’s competence level. This increase competence level is learned through the help of someone who has a higher competence level as well. Pretending can also influence a child’s ability to reason deductively (Cole, 1993). Moreover, the ability to self-regulate one’s emotions, physical behavior, and social interactions, including the ability to monitor and control cognitive processes, is thought to be essential in order to be successful in school (Bodrova & Leong, 2003). Self-regulation is part of the child brain’s executive function that serves to help humans act in an intentional way, and to learn on purpose. Vygotskians believe that self-regulation is taught.
Vygotsky believed that the activity during which young children most likely learn how to self-regulate is through a special kind of play called “intentional make-believe play” (Bodrova & Leong, 2007). From this perspective, play is the only classroom experience that naturally provides all three interactions that lead to self-regulation: being regulated by others, regulating others, and self-regulation (Bodrova & Leong, 2007). It is important to emphasize that from a Vygotskian perspective, the play that builds self-regulation is carefully designed to facilitate the interaction between and among students and teachers and lead the development of new skills and/or understandings.

**Sociodramatic play and academic skills.** The Vygotskian perspective of the purpose of preschool or kindergarten is to foster the prerequisites for future academic learning. The early childhood classroom can be structured so that the learning occurs through developmentally appropriate types of play, and specifically socio-dramatic or make-believe play. Alexander Zaporozhets, a student and a colleague of Lev Vygotsky, describes this approach as the “amplification of development” that focuses on the enrichment of the content of appropriate activities (Zaporozhets, 1986). Zaporozhets’ theory would frame what is happening in many kindergarten classrooms today as forcing the rate of a child’s learning development. Vygotsky would promote make-believe play, not as an activity that competes with academic learning but rather as enhancing it (Bodrova, 2008). Play is more than “a reflection of development: most important, it is a mechanism for propelling child development forward” (Bodrova, 2008, p. 359).

**Marzano’s Perspective.** Robert J. Marzano’s (2003) book *What Works In Schools: Translating Research Into Action* is a review and synthesis of related research spanning the past 35 years. Marzano recommends specific action steps for implementing the findings of that research. He identifies twelve factors and organizes them into three categories: 1) school-level
factors; 2) teacher-level factors; and 3) student-level factors. For this research study, it was important to consider the first school-level factor in greater detail.

**A guaranteed and viable curriculum.** The first school-level factor is a “guaranteed and viable curriculum.” Marzano ranks this as the factor having the most impact on student achievement. A guaranteed and viable curriculum is primarily a combination of the factors “opportunity to learn” and “time” (Marzano, 2000). Marzano explains, “both have strong correlations with academic achievement, yet they are so interdependent that they constitute one factor” (Marzano, 2003, p. 22).

Opportunity to learn (OTL) was first introduced more than 30 years ago as a component of the First, and then the Second International Mathematics study (FIMS and SIMS, respectively). Researchers became interested in being able to determine if all students had an equal opportunity to learn the items used to assess their mathematical achievement (Marzano, 2003 referencing Wilkins, 1997). Their findings showed that “one of the factors that may influence scores on an achievement examination is whether or not students have had an opportunity to study a particular topic or learn how to solve a particular type of problem presented by the test” (Marzano, 2003, p. 22). Marzano (2003) explains that within a short period, OTL had a “profound impact on the thinking of researchers and practitioners alike” (p. 22).

**Three types of curricula.** The SIMS identified three types of curricula: “the intended curriculum, the implemented curriculum, and the attained curriculum” (Marzano, 2003, p. 23). Marzano states that the intended curriculum is course content specified by the state, district, or school to be taught and learned at a particular grade level. The implemented curriculum is content actually delivered by the teacher. The attained curriculum is content actually learned by
students. “The discrepancy between the intended curriculum and the implemented curriculum makes OTL a prominent factor in student achievement” (Marzano, p. 23).

Vygotsky and Marzano: Complementary theories. Vygotsky and Marzano’s theories work together to explain what happens in a curriculum implementation evaluation. Marzano’s theory of a guaranteed and viable curriculum, emphasizing the concepts of “opportunity to learn” and “time”, operationalizes Vygotsky’s theory of how young children learn best. Within the context of a public school setting, the interplay of school level factors and teacher level factors have a significant impact on student learning. The Vygotskian Tools of the Mind curriculum is operationalized via Marzano’s theory of how curriculum implementation is influenced by school level factors and teacher level factors.

The intended curriculum: Tools of the Mind. The participating district selected the Tools of the Mind curriculum for the design and features that were based on Vygotskian theory about early literacy and play-based learning. The Tools curriculum developers have created a comprehensive kindergarten curriculum with very detailed lesson plans, using Vygotskian techniques to support early childhood learning to support the teacher’s effective delivery of the curriculum. In addition, a prototypical schedule is also provided that delineates the time necessary for each part of the curriculum to be taught during the day. This sets the foundation for the intended curriculum to be guaranteed and viable (Marzano, p. 25).

The enacted curriculum: Teacher-based decisions. When a school system adopts an explicit curriculum, the extent to which that curriculum can affect student achievement as it was designed is influenced by teacher-based decisions on whether or not to implement the curriculum with fidelity.

Stevenson and Stigler (1992) suggest that:
daunted by the length of most textbooks and knowing that the children’s future

teachers will be likely to return to the material, American teachers often omit some

topics. Different topics are omitted by different teachers thereby making it impossible for
the children’s later teachers to know what has been covered at earlier grades – they
cannot be sure what their students know and do not know. (p. 140)

Marzano (2003) emphasizes the importance of this simple but powerful the concept of
opportunity to learn (OTL) stating, “if students do not have the opportunity to learn the content
expected of them, there is a little chance that they will.” (p. 24). It is because of this fact that
OTL addresses the extent to which a district or school’s curriculum is “guaranteed” (Marzano,
2003, p. 24). The concept of a guaranteed curriculum means that the teachers make a
professional promise to teach the intended content. In a guaranteed curriculum “teachers do not
have the option to disregard or replace assigned content” (Marzano, 2003, p. 24). When the
enacted curriculum matches the intended curriculum, the implementation was done with fidelity.
In other words, the teachers delivered the curriculum in the way in which it was designed
(Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000).

Any school district interested in implementing the Tools of the Mind are required to sign
contract with the developers before being able to purchase the curriculum. The contract includes
mandatory professional development that provides background and training in the Vygotskian
theory on which the curriculum is based. The training highlights the rationale behind the various
curriculum components and the critical connections to Vygotskian theory about how young
children learn best. In addition, classroom-embedded coaching and technical assistance for
teachers is included to support the fidelity of curriculum implementation.

Castro, Brown, Pitvorec, and Ditto (2007), discovered that when teachers do not know
enough about the content they are teaching or do not know how to use student discussion to
enhance student understanding in meaningful ways, teachers fall back on instructional practices that are at odds with the curriculum's approach. The model of professional development used by the Tools of the Mind developers strongly supports teachers in their efforts to guarantee that they will implement the curriculum as it was intended and is reflective of research-based best practices (Davidson, Fields & Yang (2009); Castro, et al. (2007); Lieber, et al. (2009)).

The attained curriculum: student learning. Marzano (2003) stipulates that districts must use an assessment that reflects what the students had an opportunity to learn and/or that matches the learning goals for the content area and/or the grade level. When students are assessed with this type of measure, the school district can most accurately evaluate the effectiveness of the curriculum and the teachers’ delivery of it. District use of data gathered from the embedded formative and summative assessments provided as part of the Tools curriculum would be the purest translation of Marzano’s theory. However, the participating district used the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) battery to gauge early literacy skill development without regard to the curriculum used in any of their kindergarten classrooms. When evaluating what students attained, the extent to which the DIBELS test design is aligned to the reading instructional practices in the Tools curriculum classrooms should be considered.

Marzano operationalizes Vygotsky. Marzano’s theory provides the steps that are necessary to put the Vygotskyian theory into action. If a district selects a curriculum because of its underlying theory and techniques, it must be able to ensure that teachers teach it consistently, in order to have confidence that the attained or the learned curriculum can be attributed to teachers effectively teaching the intended curriculum as it was designed. Marzano’s theory that curriculum outcomes are influenced by how, what teachers actually teach, and how closely it matches the intended curriculum’s design emphasizes the importance of accessing this information if student learning outcomes are to be understood fully.
Summary of the Research Design

The outcome evaluation used in this study was a protocol provided by the Program Development and Evaluation Unit of the University of Wisconsin Cooperative Extension campus in Madison, Wisconsin. This organization specializes in planning, implementing, and evaluating high quality educational programs (Program Development, 2010). This protocol is presented in Figure 1.

![Steps in Program Evaluation](image)

**Figure 1.** Steps in program evaluation.

Limitations of the Study

This research study was an evaluation of the first year of a new curriculum implementation. The fact that it was the first year was a limiting factor in that there are always difficulties in implementing a new curriculum. Michael Fullan (2001) suggests that no matter how much pre-implementation preparation is done, the first six months or so of implementation will be bumpy. Because of the complexity of change, the learning that needs to take place on the
part of teachers in order to implement curriculum effectively, judging the effectiveness of curriculum after just the very first year of implementation may not be indicative of its true impact. Another limiting factor was that the assessment of the fidelity of the curriculum implementation was based on the teachers’ recollection of the prior year, and it was self-reported. Relying on human memory has inherent risks in that details may have been forgotten. Finally, this study conducted a secondary analysis of DIBELS data that the participating district collected on a routine basis. The data were not statistically significant because the data were not collected in a manner that would have enabled a true experimental design to be used. The data were useful only for the practical and impressionistic value that it offered the research study stakeholders.

The next chapter is the literature review of research related to play-based learning, self-regulation, and student achievement. Additionally, research on fidelity of curriculum implementation studies is cited. These two aspects of current research provide the context within which this research study was conducted.
Chapter 2: Literature Review

The process of instructional decision making that has resulted in a culture of academically focused kindergartens has occurred within a larger U.S. educational reform context. “Four primary values have informed American school reform movements: desires to improve efficiency, to raise standards of excellence, to enhance children’s full range of powers, and to increase equity” (Brint, 2006, p.254). In the current reform cycle, the purpose of this literature review was to place this research study within three larger domains:

1) The discussion of the value of play in a kindergarten curriculum and its impact on student learning; this underpins the first research question that examines how the Vygotskian theory on which the Tools of the Mind curriculum was based has been studied in the past and to cite the research that provides evidence of student learning in a play-based environment.

2) The discussion of school-based factors such as a “guaranteed and viable” curriculum as essential components to improving student achievement (Marzano, 2003); this underpins the second research question that examines the impact of teacher-based decisions on the fidelity of curriculum implementation and the research that has been done to examine this topic and its impact on student learning.

3) The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) as a measure of student learning outcomes in kindergarten; this underpins the third research question that examines how kindergarten students who have experienced the Tools of the Mind curriculum perform on the DIBELS indicators and explains the research that has led to the development of these assessment tools to predict future reading success.
The Impact of Play on Kindergarten Student Learning

Research and bodies of literature that provide data on how play supports the development of self-regulation which, in turn, correlates to student learning, are engaged to gain perspective on this phenomena.

Vygotsky’s (1977) theory and his insights into the significance of imaginative play on the cognitive and social emotional, self-regulatory growth of children are critical to investigate. His co-constructed learning and zone of proximal development are pivotal to understanding the nature of children’s knowledge construction and play-based learning that will lead to the development of cognition.

Play and early childhood. The importance of play in a child’s education has been a controversial topic of study. Even within educational circles, there is no definitive consensus. The National Association for the Education of Young Children (2009) states that play is an important vehicle for developing self-regulation as well as for promoting language, cognition, and social competency as critical to early childhood education and development. Contrastingly, we have the examples of the kindergarten classrooms in the United States that are minimizing or eliminating play during the day, likely because of “educators’ concern with the immediate utility of education, which they typically define in terms of achievement test scores and the perceived ‘inefficiency’ of activities like play” (Pellegrini, 2009 p.131; Russell, 1932/1972).

Vygotsky believed that play was critical during the early childhood years. However, not all play resulted in the same social-emotional and intellectual growth. Structured play, from a Vygotskian perspective, creates a zone of proximal development. When learning occurs within a child’s zone of proximal development it encourages and advances a student’s competence level. This increase competence level is learned through the help of someone who has a higher competence level as well. Pretending can also influence a child’s ability to reason deductively
Moreover, the ability to self-regulate one’s emotions, physical behavior, and social interactions, including the ability to monitor and control cognitive processes, is thought to be essential in order to be successful in school (Bodrova & Leong, 2003). Self-regulation is part of the child brain’s executive function that serves to help humans act in an intentional way, and to learn on purpose. Vygotskians believe that self-regulation is taught.

Vygotsky believed that the activity during which young children most likely learn how to self-regulate is through a special kind of play called “intentional make-believe play” (Bodrova & Leong, 2007). From this perspective, play is the only classroom experience that naturally provides all three interactions that lead to self-regulation: being regulated by others, regulating others, and self-regulation (Bodrova & Leong, 2007). It is important to emphasize that from a Vygotskian perspective, the play that builds self-regulation is carefully designed to facilitate the interaction between and among students and teachers and lead the learning.

**Sociodramatic play and academic skills.** The Vygotskian perspective of the purpose of preschool or kindergarten is to foster the prerequisites for future academic learning. The early childhood classroom can be structured so that the learning occurs through developmentally appropriate types of play, and specifically socio-dramatic or make-believe play. Alexander Zaporozhets, a student and a colleague of Lev Vygotsky, describes this approach as the “amplification of development” that focuses on the enrichment of the content of appropriate activities (Zaporozhets, 1986). Zaporozhets’ theory would frame what is happening in many kindergarten classrooms today as forcing the rate of a child’s learning development. Vygotsky would promote make-believe play, not as an activity that competes with academic learning but rather as enhancing it (Bodrova, 2008). Play is more than “a reflection of development: most important, it is a mechanism for propelling child development forward” (Bodrova, 2008, p. 359).
Research by Saltz, Dixon, and Johnson (1977) was designed to extend the research of Smilansky (1968) and investigate the relationship between “the degree to which children engage in imaginative play and cognitive abilities of these children” (p. 367). What they found when they trained disadvantaged preschoolers in “thematic-fantasy play” was that “there were large effects on intelligence subtests, tests of story interpretation, sequential memory, and empathy, as compared with appropriate control groups” (Saltz, et al. 1977).

Self-regulation and academic skills. For Vygotsky, it is with the assistance of others in his or her social world, the child evolves from regulation by others to the internalization of voluntary self-regulation. Vygotsky’s theory of self-regulation included voluntary attention, memory, language and logical thinking, all of which he believed developed with guidance from others (Bronson, 2000, p.118). The regulation of cognitive skills includes the ability to organize information into categories, develop rules and strategies for problem solving, plan ahead, monitor progress, and adjust thinking and behavior (Bronson, 2000). “Self-regulated learners understand, value, and engage academic learning in ways that are fundamentally different than their peers who have difficulty in school” (Paris & Newman, 1990, p. 87). It is through experience that students construct strategies for learning. However, it also can be “guided by teachers and peers to discover effective learning tactics. The shift from other-regulated to self-regulated learning is scaffolded and guided motivationally and cognitively” by those with whom the student is learning (Paris & Newman, 1990, p. 100).

Research has indicated that cognitive self-control is important in the early grades. “Among the processes that have been associated with school achievement, children’s ability to engage in self-control is of particular importance during the early grades” (Normandeau & Guay, 1998). Perhaps not surprisingly, children who are able to concentrate on the task at hand and
participate in the school day routine end up doing better academically (Normandeau & Guay, 1998).

The research connected to the Tools of the Mind curriculum, developed by Vygotskian researchers and educators Deborah Leong and Elena Bodrova, suggests a path to school-based learning success. This research examines how Vygotsky’s ideas and concepts, when applied to the early childhood classroom in a comprehensive and coordinated way, affect student success. The curriculum that has been the basis of the research data emphasizes the development of cognitive and self-regulatory skills through dramatic play, as well as self-regulatory learning while students are engaged in literacy and numeracy learning.

Researchers Kathy Hirsh-Pasek, Roberta Michnick Golinkoff, Laura E. Berk, and Dorothy G. Singer, in their monograph, *A Mandate for Playful Learning in Preschool: Presenting the Evidence* (2009), indicate that “in homes and schools across America, parents and teachers are concentrating on cognitive development, which is being treated as more important than other human subsystems such as the social and emotional domains and even physical and mental health” (p. ix). They further explain that “the result is that in many schools, kindergarten no longer contains blocks or dress up corners but instead has flash cards and workbooks” (Hirsh-Pasek, et.al., 2009, p. ix). As an alternative to this academic focus, Hirsh-Pasek et al. suggest that play is very important for teaching preschool children to regulate their own behavior so that they can focus on classroom learning. “Measured as early as 3 to 5 years of age, three core abilities collectively referred to as cognitive control predict reading and math achievement from kindergarten through high school” (Hirsh-Pasek et al., 2009, p. 28). Furthermore, “these abilities are 1) inhibition, 2) holding and operating on information in working memory, and 3) flexibility, or adjusting attention to changes in task requirements” (Hirsh-Pasek, et al., 2009, p. 28).
Although the participants in this research were in preschool, it has implications for the kindergarten population as well.

Playful learning promotes academic gain through the development of oral language. “Outside of the family, play among peers serves as the crucible for the oral language skills that children need to engage in reading” (Hirsh-Pasek et al. 2009, p. 30). Hirsh-Pasek et al. cite the work of Bergen and Mauer who found in their longitudinal investigation that 4-year-olds play predicted both language and reading readiness after the children entered kindergarten (p. 31). “Children demonstrate their most advanced language skills in playful environments, and these language skills are strongly related to literacy development” (Hirsh-Pasek, et al., 2009, p. 31).

**Literature on Fidelity of Curriculum Implementation**

Robert J. Marzano (2003) has done a synthesis of over thirty years of research of the factors that most significantly impact student achievement. In his book, *What Works in Schools*, Marzano cites a combination of school-based factors, teacher-based factors, and student-based factors. The first school-level factor is a guaranteed and viable curriculum. Marzano ranks this as the first factor, having the most impact on student achievement. A guaranteed and viable curriculum addresses the extent to which a school can “guarantee” that no matter who teaches a given course or a given grade level, certain content will be taught. In addition, the curriculum is “viable” in that teachers can adequately address the guaranteed content in the instructional time available to them (Marzano, 2000). When a school system adopts an explicit curriculum, the extent to which that curriculum can impact student achievement as it was designed, is influenced by teacher-based decisions on whether or not to implement the curriculum with fidelity.

Stevenson and Stigler (1992) suggest that:
…daunted by the length of most textbooks and knowing that the children’s future teachers will be likely to return to the material, American teachers often omit some topics. Different topics are omitted by different teachers thereby making it impossible for the children’s later teachers to know what has been covered at earlier grades – they cannot be sure what their students know and do not know. (p. 140)

“If students do not have the opportunity to learn the content expected of them, there is a little chance that they will.” (Marzano, 2003, p. 24). The OTL concept is simple but very powerful, and is the fulcrum on which a district or school’s “guaranteed” curriculum is leveraged (Marzano, 2003, p. 24). The concept of a guaranteed curriculum means that the district or school determines what should be taught and at what grade levels, and the teachers make a professional promise to teach the content with fidelity. In other words, the teachers promise that they will deliver the instruction in the way in which the curriculum was designed to be delivered (Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000). In a guaranteed curriculum “teachers do not have the option to disregard or replace assigned content” (Marzano, 2003, p. 24). When the enacted curriculum matches the intended curriculum, the implementation of this material is said to have been done with fidelity. The concept of “viability” of curriculum refers to the adequacy of time available for the articulated curriculum to be taught (Marzano, 2003, p. 25).

If school districts are interested in assessing the impact of particular curricula, schools must be able to ensure that the teachers are teaching the content with fidelity to the way in which the content was designed to be delivered. Additionally, districts must use an assessment that reflects what the students had an opportunity to learn and/or that matches the learning goals for the content area and/or the grade level. When students are assessed with this type of measure,
the school district can most accurately evaluate the effectiveness of the curriculum and the teachers’ delivery of it.

An increasingly data-driven education environment in public schools has begun to shed light on how educational outcomes are influenced by a variety of factors. “Fidelity measurement has increasing significance when making claims of educational practices being effective in today’s classrooms” (Vartuli and Rohs, 2009, p.502). In a review of the literature that offers insight into fidelity issues and processes, it is clear that this is an area that is emerging as a result of the current emphasis on Response to Intervention research (O’Donnell, 2008; Walker, Golly, McLane, & Kimmich, 2005). Now fidelity is an expected component of quality evaluation practice and research (Vartuli, & Rohs, 2009). Vartuli and Rohs (2009) explain that “fidelity criteria allow the researcher to measure adherence to a model so that curriculum can be consistently researched and replicated” (p. 502). They further explain that “failure to provide fidelity outcomes can severely limit the conclusions to research findings, or it may mean that the findings are ambiguous” (Vartuli, & Rohs, p. 502). Unfortunately, there are “too few studies to guide researchers on how fidelity to core curriculum intervention can be measured and related to outcomes” (O’Donnell, 2008, p. 34). This is an area of potential future study.

In general, fidelity research focuses on treatment, program, and curriculum fidelity. Treatment fidelity requires “strict adherence to the designed strategies to measure if the results were due to the prescribed program” (Vartuli and Rohs, 2009, p. 503). Program fidelity is broader in scope and involves the identification of a model’s critical components, collection of data to measure these components, and an examination of these components in terms of their reliability and validity (Mowbray, Holter, Teague, and Bybee, 2003). A key issue in program and treatment fidelity is replication vs. adaptation. “Concrete, well-specified programs appear to be more suitable to adoption (replication) with fidelity, whereas more ambiguous, less clearly
defined programs might thrive under conditions of adaptation” (Vartuli and Rohs, p. 503, citing Emshoff, Blakely, Gottschalk, Mayer, Davidson, & Erickson, 1987). Curriculum fidelity involves consideration of classroom complexities, including teacher characteristics, family characteristics and involvement, children’s characteristics, and school characteristics (Vartuli and Rohs).

It is important to have an objective way to evaluate curriculum implementation. “Without fidelity assurances, one can only assume that the curriculum was adhered to and delivered with the same consistency and precision in every classroom” (Vartuli & Rohs, 2009, p. 506). A review of literature that addresses fidelity of curriculum implementation in early childhood and early elementary school grade levels reveals research efforts to 1) measure the degree to which teachers have the ability to implement the curriculum with fidelity (Davidson, Fields, and Yang, 2009; Castro, Brown, Pitvorec, and Ditto, 2007; Lieber, Butera, Hanson, Palmer, Horn, Czaja, Diamond, Goodman-Jansen, Daniels, Gupta, and Odom, 2009; and Vartuli & Rohs); 2) measure the degree to which teachers are motivated to implement the curriculum with fidelity (Davidson, et al.; Castro, et al.; Lieber, et al.; and Vartuli & Rohs); and 3) understanding the ways in which professional development can make a difference in implementing curriculum with fidelity (Lieber, et al., 2009). The disciplines involved in conducting this very recent research range from the special education field, early childhood education, psychology, and elementary mathematics education.

**Teacher ability.** The literature reviewed involved mixed methods approaches to answering the researchers’ questions. One methodological approach was to provide a pre-test and post-test to the students as a means of quantifying the students’ early literacy skill knowledge and growth (Davidson, et al., 2009). A more common technique to collect data about
how curriculum was being implemented was to use classroom observations (Davidson, et al. 2009; Castro, et al. 2009).

Castro et al. (2009), discovered that when teachers do not know enough about the content they are teaching or do not know how to use student discussion to enhance student understanding in meaningful ways, teachers fall back on instructional practices that are at odds with the curriculum's approach.

**Teacher motivation.** Recent research provides evidence for direct links between the content of teachers' instruction and what young children learn in preschool (Lieber, et al. 2009). Yet the goal of instructing children in specific academic or social skills has not been central to the mission of early education in the United States (Lieber, et al. 2009). In one study, teacher motivation and reflections on curriculum implementation was accessed through the Teacher Knowledge and Attitude Survey (TKAS) (Cunningham, Perry, Stanovich, & Stanovich, 2004, cited in Davidson, et al., 2009). In this study, the researchers categorized teachers into two groups: 1) high implementers; and 2) low implementers. Some of those who were considered low or poor implementers “could be categorized as resistant to implementing some of the key components” because these components went against their teaching philosophy (Davidson et al. 2009, p. 199).

**The role of professional development.** Lieber et al. (2009) suggest that there is “limited research evidence…identifying professional development interventions that are effective in changing early childhood teachers’ instructional practices” (p. 457). Adequate training and support for teachers are especially important given recent evidence that a teacher's instruction and supportive interactional style are important factors that promote children's active involvement in learning (Lieber et al., 2009, p. 459). In the literature reviewed, there were multiple full-day training sessions that oriented the teachers to the use of a specific curriculum
and instructional approach (Davidson, et al.; Castro, et al.; Lieber, et al.). Additionally, in two of the studies an implementation coach was used who worked directly with the teachers through a series of classroom visits and dialogue with teachers (Davidson et al., Lieber, et al.). Interestingly, Lieber et al., and Davidson et al., in separate studies, both found that professional development alone did not result in teachers implementing the respective curriculum with fidelity.

**Implications for the current research study.** Adequate training and support for teachers are especially important given recent evidence that a teacher’s instruction and supportive interactional style are important factors that promote children’s active involvement in learning (Lieber et al., 2009, p. 459). Effective pedagogy is complex and challenging (Ginsburg, Kaplan, Cannon, Cordero, Eisenband, & Galanter, 2006; Maxwell, Field, & Clifford, 2006), as are interventions designed to affect both teachers' instruction and children's learning (Lieber et al., 2009, p. 459). This research study was designed as an outcome evaluation of one district’s implementation of a play-based curriculum at the end of the first year of this curriculum’s implementation. As a means to establishing the credibility of the research findings, the study design must include a vehicle for accessing teacher input on the quality of implementation, reflection on each teacher’s individual level of fidelity to the intended curriculum, and the extent to which the curriculum provided the opportunity for the students to learn the content tested by the DIBELS kindergarten battery.

As Marzano (2003) suggested, the attained curriculum is the content actually learned by students (p. 23). In order to access what the students have learned there must be assessment. Marzano cites research by George Madaus and his colleagues that found that “tests that are not specifically designed to assess a particular school’s curriculum frequently underestimate the true learning of students” (Madaus, Kellagahan, Rakow, & King, 1979; Madaus, Airasian, &
Kellaghan, 1980; cited by Marzano, p. 38). Marzano (2003) further emphasizes that “unless a school employs assessments that are specific to the curriculum actually taught, it cannot accurately determine how well its students are learning” as a result of the intended and implemented curriculum (p. 38). In this research study, the tool that was used to assess student reading skill was the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) measures.

The DIBELS: Measuring Kindergarten Student Learning Outcomes

The National Reading Panel (2000) identified the five essential components of reading instruction. These components are phonemic awareness, phonics, fluency, vocabulary, and comprehension. Students must be proficient in these five critical areas for reading success. The federally-funded, $1 billion-a-year Reading First program approved the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment tool to be used in 45 states to monitor student progress on reading fluency and other measures (NCLBA).

The DIBELS are brief (one minute or three minute) measures specifically designed to assess the skills forming the basis for early reading success. The measures are linked to one another, both psychometrically and theoretically, and have been found to be predictive of later reading proficiency (Kaminski and Good, 1996). Combined, the measures form an assessment system of early literacy development that allows educators to determine student progress. There has been extensive research conducted on the DIBELS measures and how they accurately predict performance on important outcomes that depend on ability to read and comprehend written text (DIBELS resources, 2010).

The DIBELS are intended to be administered as a baseline assessment in the fall of the school year for kindergarten through grade three students. This battery of tests identifies those students who are at risk for having reading difficulties. These tests are designed to be used again
in winter to measure student progress against mid-year benchmarks. The final time the DIBELS are administered is in late spring to determine if students have reached end of year benchmark targets. Table 1 indicates the kindergarten tests.

Table 1
Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Tests Used in Kindergarten

<table>
<thead>
<tr>
<th>Component</th>
<th>DIBELS Measure</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonemic Awareness</td>
<td>Initial Sound Fluency (ISF)</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Phoneme Segmentation Fluency (PSF)</td>
<td>--</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Phonics (Alphabetic Principle)</td>
<td>Letter Naming Fluency (LNF)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Nonsense Word Fluency (NWF)</td>
<td>--</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

What follows is a description of each DIBELS subtest given at the kindergarten level taken from the DIBELS website (DIBELS resources).

**Initial Sound Fluency (ISF).** The DIBELS Initial Sound Fluency (ISF) Measure is a standardized, individually administered measure of phonological awareness that assesses a child's ability to recognize and produce the initial sound in an orally presented word (Kaminski & Good, 1996, 1998; Laimon, 1994). The ISF measure is a revision of the measure formerly called Onset Recognition Fluency (OnRF). The examiner presents four pictures to the child, names each picture, and then asks the child to identify (i.e., point to or say) the picture that begins with the sound produced orally by the examiner. For example, the examiner says, "This is sink, cat, gloves, and hat. Which picture begins with /s/?" and the student points to the correct picture. The child is also asked to produce the beginning sound for an orally presented word that matches one of the given pictures. The examiner calculates the amount of time taken to
identify/produce the correct sound and converts the score into the number of initial sounds correct in a minute. The ISF measure takes about three minutes to administer and score and has over 20 alternate forms to monitor progress.

ISF is a measure that assesses phonemic awareness skills. Phonemic Awareness (PA) is:

1) The ability to hear and manipulate the sounds in spoken words and the understanding that spoken words and syllables are made up of sequences of speech sounds (Yopp, 1992).

2) Essential to learning to read in an alphabetic writing system, because letters represent sounds or phonemes. Without phonemic awareness, phonics makes little sense.

3) Fundamental to mapping speech to print. If a child cannot hear that "man" and "moon" begin with the same sound or cannot blend the sounds /rrrrruuuunnnn/ into the word "run", he or she may have great difficulty connecting sounds with their written symbols or blending sounds to make a word.

4) A strong predictor of children who experience early reading success.

**Letter Naming Fluency (LNF).** DIBELS Letter Naming Fluency (LNF) is a standardized, individually administered test that provides a measure of risk. LNF is based on research by Marston and Magnusson (1988). Students are presented with a page of upper- and lower-case letters arranged in a random order and are asked to name as many letters as they can. Students are told if they do not know a letter, they will be told the letter. The student is allowed one minute to produce as many letter names as he/she can, and the score is the number of letters named correctly in one minute. Students are considered at risk for difficulty achieving early literacy benchmark goals if they perform in the lowest 20% of students in their district. The 20th percentile is calculated using local district norms. Students are considered at some risk if they
perform between the 20th and 40th percentile using local norms. Students are considered at low risk if they perform above the 40th percentile using local norms.

Letter Naming Fluency (LNF) is included for students in grades K and one as an indicator of risk. Unlike the other DIBELS measures, LNF does not measure a Basic Early Literacy Skill. Although letter names comprise a set of teachable skills, teaching letter names does not lead directly to improvements in student reading outcomes in the ways characterized by the foundational skills of early literacy (Adams, 1990). However, because the measure is highly predictive of later reading success, it is included as an indicator for students who may require additional instructional support on the Basic Early Literacy Skills.

**Phoneme Segmentation Fluency (PSF).** The DIBELS Phoneme Segmentation Fluency (PSF) measure is a standardized, individually administered test of phonological awareness (Kaminski & Good, 1996). The PSF measure assesses a student's ability to segment three- and four-phoneme words into their individual phonemes fluently. The PSF measure has been found to be a good predictor of later reading achievement (Kaminski & Good, 1996). The PSF task is administered by the examiner orally presenting words of three to four phonemes. It requires the student to produce verbally the individual phonemes for each word. For example, the examiner says "sat," and the student says "/s/ /a/ /t/" to receive three possible points for the word. After the student responds, the examiner presents the next word, and the number of correct phonemes produced in one minute determines the final score. The PSF measure takes one minute to administer and has over 20 alternate forms for monitoring progress.

PSF is a measure that assesses phonemic awareness skills. Phonemic Awareness (PA) is:

1) The ability to hear and manipulate the sounds in spoken words and the understanding that spoken words and syllables are made up of sequences of speech sounds (Yopp).
2) Essential to learning to read in an alphabetic writing system, because letters represent sounds or phonemes. Without phonemic awareness, phonics makes little sense.

3) Fundamental to mapping speech to print. If a child cannot hear that "man" and "moon" begin with the same sound or cannot blend the sounds /rrrrruuuuuunnnnn/ into the word "run", he or she may have great difficulty connecting sounds with their written symbols or blending sounds to make a word.

4) Essential to learning to read in an alphabetic writing system

5) A strong predictor of children who experience early reading success.

**Nonsense Word Fluency (NWF).** The DIBELS Nonsense Word Fluency (NWF) measure is a standardized, individually administered test of the alphabetic principle - including letter-sound correspondence in which letters represent their most common sounds and of the ability to blend letters into words in which letters represent their most common sounds (Kaminski & Good). The student is presented an 8.5" x 11" sheet of paper with randomly ordered VC and CVC nonsense words (e.g., sig, rav, ov) and asked to produce verbally the individual letter sound of each letter or verbally produce, or read, the whole nonsense word. For example, if the stimulus word is "vaj" the student could say /v/ /a/ /j/ or say the word /vaj/ to obtain a total of three letter-sounds correct. The student is allowed one minute to produce as many letter-sounds as he/she can, and the final score is the number of letter-sounds produced correctly in one minute. Because the measure is fluency based, students should receive a higher score if they are phonologically recoding the word, as they will be more efficiently producing the letter sounds, and receive a lower score if they are providing letter sounds in isolation. The intent of this measure is that students are able to read unfamiliar words as whole words, not just name letter sounds as fast as they can.

NWF is a measure that assesses alphabetic principle skills. Alphabetic Principle (AP) is:
1) The ability to associate sounds with letters and use these sounds to form words. It is composed of two parts:
   a) Alphabetic Understanding: Letters represent sounds in words.
   b) Phonological Recoding (blending): Letter sounds can be blended together and knowledge of the systematic relationships between letters and phonemes (letter-sound correspondence) can be used to read/decode words.

2) A prerequisite to word identification.

The DIBELS results are interpreted through categories that reflect the risk associated with the student’s performance on a particular indicator such as LNF or PSF. This risk is translated into a level of additional intervention needed in order for that student to reach grade level reading benchmarks. “A high percentage of children needing intensive intervention indicates a concern about the core curriculum provided to all kindergarten students” (Good, Kaminski, Smith, Simmons, Kame'enui, Wallin, 2003, p. 3). The DIBELS results provide specific kindergarten data on basic early literacy skills that “can assist a school team in evaluating and planning components of effective beginning reading programs, including professional development, instruction, curriculum materials, and supplemental materials” (Good et al., 2003, p .2).

A Methodological Review

This methodological review focuses on research studies that examined the role of play, self-regulation, and early childhood academic experiences and/or achievement. Four of the six studies reviewed were conducted within the last ten years (Matthews, Morrison, & Ponitz 2009; Ponitz, Matthews, Morrison, McClelland 2009; Rimm-Kaufman, Grimm, Curby, Nathanson,

**Disciplines in which the research is being conducted.** This research is being conducted by developmental and educational psychologists (Matthews, et al.; Ponitz, et al.; Rimm-Kaufman, et al.; Carlson & Wang; Huston-Stein, Friedrich-Cofer, & Susman, 1977; Strommen, 1973). Psychology is the study of brain processes and behavior. Self-regulation is a multi-dimensional construct, which includes cognitive, emotional, and behavioral components.

**Theoretical frameworks.** Researchers conceptualized the problem slightly differently depending upon the way in which they went about studying it. However, the theme of behavioral self-regulation and academic achievement in kindergarten was most common (Matthews, et al.; Ponitz, et al.; Rimm-Kaufmann, et al.). Given that, there were other key words that are associated with self-regulation, such as self-control, inhibitory control, or executive function that generated research studies on this topic (Ponitz et al.; Rimm-Kaufmann; Carlson & Wang; Huston-Stein; Strommen). All the studies used a quasi-experimental design, in that they used statistical techniques to account for confounding variables that could not be eliminated from the research by design. However, some researchers chose to include some qualitative measures such as teacher or parent questionnaires to access additional data (Matthews, et al.; Ponitz, et al.; Rimm-Kaufmann, et al.; Carlson & Wang).

**A discussion of data. Age and socio-economic status of participants.** Participants across the six different studies were primarily middle to upper middle class preschool or kindergarten students in suburban or urban settings in the United States. Three studies were based in Michigan (Matthews, et al.; Ponitz et al.; and Strommen). One of the studies included Oregon (Ponitz, et al.) in connection with Michigan. The other studies were conducted in a mid-Atlantic state (Rimm-Kaufmann, et al.), in Kansas and Pennsylvania (Huston-Stein, et al.) and a
locale only described as a large metropolitan area (Carlson & Wang). Two studies used rural children from working class or poor family backgrounds (Huston-Stein, et al.; Rimm-Kaufmann, et al.). Rimm-Kaufmann, et al. qualified this sample as one that was often neglected in typical samples. All studies had a means of obtaining the informed consent of the participants’ parents.

**Settings.** Most of the studies were conducted within the actual classroom settings of the children on whom data were being collected. However, there were two studies in which a laboratory setting on a university campus was used. (Carlson & Wang; Strommen).

**Measures.** The studies used a combination of rating tools, questionnaires, and direct observations. The measures used to assess students’ self-regulation have been developed within the last handful of years or so. This suggests that this is a new area of research. One of the instruments used is the Head-Toes-Knees-Shoulders Task (HTKS) (Ponitz, McClelland, Jewkes, Connor, Farris, & Morrison, 2008) which is a new version of the Head-to-Toes Task developed by researchers at the University of Michigan. Both tasks have proved effective at predicting academic skills among preschool age children. The HTKS is conducted by a structured observation requiring children to perform the opposite of a response to four different oral commands. For example, children are supposed to touch their toes when they are told to touch their head, and vice versa. Another instrument being used is the Preschool Self-Regulation Assessment (Smith-Donald, et al., 2007) which directly assesses young children’s emotional, attentional, and behavioral self-regulation through a brief, structured battery of tasks in conjunction with a global report of children’s behavior. On this assessment, there are four delay tasks designed to tap children’s effortful control: Toy Wrap, Toy Wait, Snack Delay, and Tongue Task (Murray & Kochanska, 2002). These are three tasks of executive control because they require children to filter competing stimuli: Balance Beam, Tower Task (Maccoby, Dowley, Hagen, & Degerman, 1965; Murray & Kochanska, 2002) and Pencil Tap (Blair, 2002; Diamond
& Taylor, 1996); and finally, three “do”-tasks to assess children’s compliance: Tower Cleanup, Toy Sort, and Toy Return (see, e.g., Brumfield & Roberts, 1998; NICHD, 1998). A third instrument that was used in the research was the Behavior Rating Inventory of Executive Function–Preschool Version (BRIEF-P, Gioia, Espy, & Isquith, 2003) The Behavior Rating Inventory of Executive Function–Preschool Version® (BRIEF®-P; Gioia, Espy, & Isquith, 2003) is a standardized rating scale developed to provide a window into everyday behaviors associated with specific domains of executive functioning in children ages two to five years.

Both parents and teachers were given questionnaires that were used to collect their respective perceptions and/or impressions of child- or student-based skills or behaviors (Carlson & Wang, Rimm-Kaufmann et al.). Researchers used the Woodcock-Johnson III subtests of Cognitive Abilities as the academic assessments of student skills and capabilities in literacy and math as pre- and post-test measures (Matthews et al., Ponitz et al.).

Collecting observational data and coding it. In studies where there were direct observations done in order to collect data, the studies used research assistants who were blind to the hypothesis (Rimm-Kaufmann et al., Carlson & Wang). This measure was taken to try to eliminate bias on the part of the researchers collecting and coding the data. In another study (Huston-Stein, et al.), the potential for bias was reduced by using overlapping observer/researchers.

A Discussion of Research Design

All the studies that were reviewed were quantitative or mixed method research designs that were quasi-experimental. There were no true experimental designs where there was a treatment and a control group. All the studies reviewed used statistical techniques to control for confounding variables to uncover correlations between and among different factors. One of the
techniques that was used in all studies was an analysis of variance. This examines the variation in the outcomes of an experiment to assess the contribution of each variable to that variation.

As a result, there were plenty of data in each study to be analyzed and the results were, perhaps, more generalizable. The researchers dealt with the “nested” nature of the data (i.e. students nested within classrooms, nested within schools) and the cross-level data (i.e. environmental vs. individual) they were collecting by using a multi-level, linear regression technique call hierarchical linear modeling (HLM) for which there is user-friendly software (Matthews et al.; Ponitz et al.; Rimm-Kaufmann et al.; Carlson & Wang). Additionally, in order to compensate for missing data in some situations, they used a statistically valid approach called multiple imputation, which substitutes some value for a missing data point or a missing component of a data point. (Matthews et al.; Ponitz et al.; Rimm-Kaufmann et al.)

**Findings.** Two of the studies featured one of the same researchers. (Matthews et al.; Ponitz et al.) The latter study referenced the work of the earlier study. In this way, the results were perhaps more significant because the results reinforced prior work. The critical finding in this case was that behavioral regulation is connected with achievement and specific aspects of classroom function in early childhood. Additional findings that seem to be significant in the bigger picture and generate areas for further research were that 1) self-regulation or the executive control of attention, action, and emotion are skills that develop together during preschool; (Carlson & Wang) and 2) from an ecological perspective, the process features of kindergarten classrooms are important contributors to children’s self-regulation development (Rimm-Kaufmann, et al.; Huston-Stein, et al.).

**Issues for further study.** These studies identified several important issues and suggested that these need to be pursued in future research efforts. It was suggested that in identifying ideal practices for early childhood classrooms, that there must be interdisciplinary
research that brings together a developmentally informed view of children and educational goals of schools, as the connection between the child and classroom environment is so dynamic (Rimm-Kaufmann, et al.; Huston-Stein, et al.).

It was also suggested in one of the earlier studies (Huston-Stein, et al.) that there was a lack of research on the impact of different types of educational interventions on social, imaginative, and self-regulatory behavior. Despite the thirty years that have passed since that time, there appears to be much work to do to understand self-regulation in early childhood. In order for this to be possible, Ponitz, et al., suggested that work is needed in the area of the creation and systematic evaluation of tasks appropriate for young children that are meaningfully predictive of development throughout the early years of school. Moreover, in the studies that examined self-regulation as it related in some way to the classroom, it was suggested that there remains the need to look more deeply at the role of behavioral self-regulation in kindergarten and explore it in relation to academic achievement, especially in math (Matthew, et al.; Ponitz, et al.; Huston-Stein, et al.). Finally, there were two studies that suggested that gender-based differences need to be explicitly explored in relation to early-childhood levels of self-regulation and academic achievement (Matthews, et al.; Strommen).
Chapter 3: Methodology

This qualitative research study was an outcome evaluation of one district’s implementation of the play-based Tools of the Mind curriculum during the 2010-2011 school year, and the DIBELS results of the kindergarten students who experienced this curriculum. Three research questions were explored during this study:

Research Questions

1. How does the Tools of the Mind curriculum develop student literacy skills and understandings through play?

   Vygotsky’s theories are the foundation on which kindergarten learning play can be built. Vygotsky believed that children co-constructed their learning and that learning leads the development of cognitive skills. He focused on how children’s imaginative make-believe play is the process by which many cognitive skills are developed. Vygotsky also believed that the self-regulatory skills that are necessary to sustain mature make-believe play are critical to academic success.

   As a process-oriented question, this study was designed to identify the specific ways in which the Tools of the Mind curriculum embeds the learning of literacy concepts and skills, and self-regulation within the play-based structures and activities of the children’s day. This was an investigation into what Marzano calls the intended curriculum.

2. How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented?

   As Marzano suggests, if school districts are interested in assessing the impact of particular curricula, schools must be able to ensure that the teachers are teaching the content with
fidelity to the way in which the content was designed to be delivered and to the way in which the lessons were written.

As a process-oriented question, the teachers who were responsible for implementing this curriculum were surveyed about the fidelity of their implementation. In addition, follow up interviews captured teachers’ reflections, experiences, beliefs, and perspectives on how well this curriculum develops basic, early literacy skills measured by the DIBELS, and the learning that resulted that was not captured by the DIBELS. This was an investigation into what Marzano calls the enacted curriculum.

3. How do students who have experienced the Tools curriculum perform on the DIBELS?

   The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are brief, one-to-three minute-long tests designed to assess the skills that form the basis for early reading success. These measures are linked to one another, both psychometrically and theoretically, and have been found to be predictive of later reading proficiency (Kaminski & Good, 1996).

   Data is collected at three testing periods in the school year (fall, winter, and spring) to benchmark student learning and progress. In this study, these data were examined to discover patterns of student learning growth across time and compared to national norms. This was an investigation into what Marzano calls the attained curriculum.

**Methodology for Research Study**

Outcome evaluation is one approach to determining the effectiveness of a curriculum in meeting learning goals and objectives. The Program Development and Evaluation Unit of the University of Wisconsin Cooperative Extension campus in Madison, Wisconsin specializes in planning, implementing, and evaluating high quality educational programs (Program
The protocol for conducting an outcome evaluation that is shown in Figure 1.

What follows is an explanation of each of the five steps in this protocol and how they were addressed in this research study.

**Step #1: Engage stakeholders.** Stakeholders in the participating district were engaged through the inquiry of whether or not they would be interested in having their district’s implementation of Tools of the Mind the subject of a doctoral research study. The director of early childhood as well as the four teachers who implemented the Tools of the Mind curriculum during the 2010-2011 school year were recruited to participate.

**Step #2: Focus.** Typically, an outcome evaluation includes a logic model. A logic model is a systematic and visual way to present the relationships among the resources an organization has, the activities it plans, and the changes and results it hopes to achieve. In a logic model, all

![Figure 1. Steps in program evaluation.](image-url)
of the components of a program are identified: the inputs (resources), activities, outputs and outcomes (United Way, p. 4). They are presented graphically to show how they combine to stimulate and support the desired changes.

Table 2

Basic Components of a Logic Model

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Staff</td>
<td>• Conduct workshops</td>
<td>• Number of clients</td>
<td>• Learnings</td>
</tr>
<tr>
<td>• Volunteers</td>
<td>• Facilitate meetings</td>
<td>• Participants</td>
<td>• Behavior</td>
</tr>
<tr>
<td>• Financial</td>
<td>• Deliver services</td>
<td>• Customers</td>
<td>• Conditions</td>
</tr>
<tr>
<td>resources</td>
<td>• Provide counseling</td>
<td>• Number of Products Produced</td>
<td></td>
</tr>
<tr>
<td>• Materials</td>
<td>• Train</td>
<td>• Hours of program/service provision</td>
<td></td>
</tr>
<tr>
<td>• Research</td>
<td>• Develop resources</td>
<td>• Numbers of different services</td>
<td></td>
</tr>
<tr>
<td>• Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Space</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


A logic model based on the inputs, activities, and outputs of this research study is shown in Table 3.
Table 3

Logic Model for this Research Study

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>ACTIVITIES</th>
<th>OUTPUTS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools of the Mind curriculum</td>
<td>Detailed description of Tools of the Mind curriculum as it relates to play, literacy skill development, and self-regulation.</td>
<td>Teachers trained (4) in Tools of the Mind curriculum</td>
<td>Teacher ability to implement Tools of the Mind</td>
</tr>
<tr>
<td>Kindergarten Teachers (4)</td>
<td>Teachers implementation practices and decisions solicited via anonymous survey and interview questions</td>
<td>The number of kindergarten students who have been immersed in the play-based curriculum.</td>
<td></td>
</tr>
<tr>
<td>Director Early Childhood</td>
<td>Interviewed for additional stakeholder perspective and to triangulate data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten Students</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Inputs as data sources.** Each of the inputs is the source of data that enabled the research questions to be answered. First, the actual Tools of the Mind curriculum, contained in five manuals, was dissected and analyzed to discover the ways in which play, literacy skill development and self-regulation were developed and used across the school year to support kindergarten study learning. This enabled the intended curriculum to be understood as well as the first research question that explored how the Tools of the Mind curriculum developed students’ literacy skills and understandings through play.

Second, the kindergarten teachers were surveyed to discover if the teachers’ implementation of the Tools of the Mind curriculum reflected the curriculum as it was intended to be implemented. This enabled the enacted curriculum to be understood as well as the second research question that explored how well the teachers’ implementation of the Tools of the Mind
curriculum matched the curriculum as it was intended to be implemented. In addition, follow-up
interviews were conducted to provide teachers with the opportunity to comment on, among other
things, how the DIBELS tests reflect literacy skills learning as taught through the Tools of the
Mind curriculum.

Finally, the kindergarten student results from each of the three benchmark DIBELS test
administrations served as outcome indicators to document student progress toward the outcome
target of having all students on grade level for literacy learning as they end their kindergarten
year. This enabled the attained curriculum to be understood as well as the third research
question that explored how students who experienced the Tools of the Mind curriculum perform
on the DIBELS.

Site and Participants

The research site was a regional school district in a rural, coastal part of New England.
The student population was predominantly white and non-low-income. The school district has
four elementary schools. District leadership agreed to participate in the research study with the
researcher’s assurance of anonymity. This site and these participants were a sample of
convenience due to the accessibility of this school district and the difficulty in gathering this type
of data, which is dependent on a district that implements the Tools of the Mind kindergarten
curriculum.

During the 2010-2011 school year, two of the four schools elementary schools of the
participating school district implemented the Tools of the Mind curriculum as a pilot. The two
schools that implemented the Tools curriculum each housed two kindergarten classrooms. The
combined total from the four classrooms was approximately 50 students. The district gave
permission for access to these students’ DIBELS benchmark data for fall, winter, and spring.
The four teachers who participated in the study were promised anonymity in an effort to get the most candid responses from them regarding their implementation, perspectives, and experiences. Because of the promise of anonymity, pseudonyms were used.

**Step #3: Collect data.** Data were collected from three sources in this study. The first source was the Tools of the Mind kindergarten curriculum. An analysis of the curriculum was done to identify how the different components supported early literacy learning identified in the National Reading Panel Report (2000) (Appendix A).

The second data source was the teachers who taught the Tools curriculum. Through a voluntary, anonymous, electronic, Likert-type survey, the kindergarten teachers provided data about the fidelity of their curriculum implementation. Additionally, they responded to questions about the Tools curriculum, DIBELS and student learning (Appendix B). After these surveys and the student DIBELS data were analyzed, these teachers were interviewed to collect data on their individual perspectives and impressions that would help to create a more complete picture of the teachers’ beliefs, behaviors, and evaluation of outcomes after implementing the curriculum and considering DIBELS results (Appendix C).

The final source was DIBELS data from the students who experienced the Tools curriculum. The participating district administered and collected results from the DIBELS three times of the year: fall, winter and spring. Student scores were analyzed from the following kindergarten level DIBELS tests: 1) Initial Sound Fluency (ISF); 2) Letter Naming Fluency (LNF); 3) Phoneme Segmentation Fluency (PSF); and 4) Nonsense Word Fluency (NWF).

**The curriculum.** The Tools of the Mind curriculum, published in five volumes, was analyzed for the specific literacy concepts and skills developed across the year and how they were incorporated into play. The differences between the Vygotskian approach to early literacy learning and a traditional approach were noted. This provided a framework for analyzing the
content and skills that the students would have the opportunity to learn were the curriculum implemented as it was designed. This analysis was also used to understand how well the DIBELS battery was matched to the intended curriculum.

The National Reading Panel (2000) published a report entitled *Teaching Children to Read: An Evidenced Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. The central components of learning to read were detailed. Table 4 briefly describes the literacy topic and the findings and determinations that were documented.
**Table 4**  
*Key Components to Early Literacy Learning Reported by the National Reading Panel (2000)*

<table>
<thead>
<tr>
<th>Literacy Topic</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alphabets:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Phonemic Awareness (PA)</strong></td>
<td>Teaching phonemic awareness to children significantly improves their reading more than instruction that lacks any attention to PA. (Report of National Reading Panel, p. 7)</td>
</tr>
<tr>
<td></td>
<td>PA training was the cause of improvement in students’ phonemic awareness, reading, and spelling following training.</td>
</tr>
<tr>
<td><strong>Alphabets:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Phonics</strong></td>
<td>Systematic phonics instruction produces significant benefits for students in kindergarten through 6th grade and for children having difficulty learning to read. The ability to read and spell words was enhanced in kindergartners who received systematic beginning phonics instruction.</td>
</tr>
<tr>
<td><strong>Fluency</strong></td>
<td>“Guided repeated oral reading procedures that included guidance from teachers, peers, and parents had a significant and positive impact on word recognition, fluency, and comprehension across a range of grade levels” (p. 12)</td>
</tr>
<tr>
<td><strong>Vocabulary</strong></td>
<td>Vocabulary instruction does lead to gains in comprehension, but methods must be appropriate to the age and ability of the reader. Vocabulary also can be learned incidentally in the context of storybook reading or in listening to others. Learning words before reading a text also is helpful. Techniques such as task restructuring and repeated exposure (including having the student encounter words in various contexts) appear to enhance vocabulary development. (p.14)</td>
</tr>
<tr>
<td><strong>Text Comprehension</strong></td>
<td>Evidence suggests that teaching a combination of reading comprehension techniques is the most effective. When students use them appropriately, they assist in recall, question answering, question generation, and summarization of texts. When used in combination, these techniques can improve results in standardized comprehension tests. (p. 15)</td>
</tr>
</tbody>
</table>

**The teacher survey and individual interviews.** Teacher-based data were collected via two means: 1) an electronic survey; and 2) individual interviews.

**Development of the survey instrument.** The survey design was informed by Marzano’s (2003) work. It was intended to access teacher feedback on all aspects of the self-regulation and literacy-based instructional categories of the Tools of the Mind curriculum, as well as district
support (which might be a factor in being able to implement fully the curriculum) and student learning.

There were two major sections of the survey: 1) Curriculum implementation; and 2) Student achievement. Within the curriculum implementation section, there were four subsections: self-regulation activities, literacy block activities, Scaffolded Writing activities, and other literacy activities. The questions were all Likert-type scale questions. The Likert-type scale was a 1-5 scale with “1” being “strongly disagree” and “5” being “strongly agree.” Table 5 reflects a breakdown of the survey sections and the number of questions contained in each.

Table 5
Number of Questions in Each of the Teacher Survey Sections

<table>
<thead>
<tr>
<th>Question Section</th>
<th>Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART A: Curriculum Implementation</td>
<td>7</td>
</tr>
<tr>
<td>Subsection on: Self-Regulation</td>
<td>5</td>
</tr>
<tr>
<td>Subsection on: Literacy Activities</td>
<td>10</td>
</tr>
<tr>
<td>Subsection on: Scaffolded Writing Activities</td>
<td>6</td>
</tr>
<tr>
<td>Subsection on: Other Literacy Activities</td>
<td>3</td>
</tr>
<tr>
<td>PART B: Student Achievement</td>
<td>14</td>
</tr>
<tr>
<td>Total Number of Questions</td>
<td>45</td>
</tr>
</tbody>
</table>

A copy of the complete survey that was used can be found in Appendix B.

Pilot testing of survey. The final stage of developing effective questionnaires is to test the questionnaire with a sample of respondents to identify any problems in the survey and/or its layout (United Way, p. 70). As part of the Institutional Review Board process, the survey was reviewed and a suggestion was made to add a sixth response choice to the Likert-type scale questions. The sixth response was titled “choose not to answer.” Providing this sixth possible response would ensure that teachers were not being forced into making a choice among the
Likert-type scale options that did not reflect their true opinion. This suggestion was taken and the survey was modified to include this additional, sixth answer option.

A pilot test was done with two early childhood educators in the researcher’s district. One of these educators had general knowledge of the Tools of the Mind curriculum, the other was an experienced kindergarten teacher. As recommended by the United Way’s *Toolkit for Outcome Measurement* (2004), the teachers were asked to comment on the following aspects of the survey:

- Clarity of title and survey purpose
- Ease of following instructions
- Aesthetics of layout
- Ease of accessing and interacting with a web-based survey being supported by LimeSurvey™
- Clarity of each question’s meaning
- Ease of answering each question
- Flow and coverage of question topics and questions
- Length and estimated time to complete survey

The piloting teachers confirmed that the survey did not present any issues in the categories on which they were asked to comment. They made no suggestions to modify or enhance the survey as it was provided to them. Subsequently the survey was administered to the participating school district’s kindergarten teachers via e-mail.

**Data collection procedures.** The first step in data collection was to recruit the teachers via an e-mail message (See Appendix E). The participating district provided the work e-mail addresses of the four teachers who implemented Tools of the Mind during the 2010-2011 school year. The recruiting letter invited the kindergarten teachers to take part in this research study
through a brief, anonymous, web-based survey. Directions, including the URL link to the survey were incorporated into the first e-mail invitation. In the first invitation, prospective participants were asked to respond within a week. If not all teachers responded to the first invitation, a second generic invitation would be sent (Appendix E).

**Development of individual interview questions.** The teacher survey results would be analyzed and used in combination with the DIBELS data analysis to generate questions for the individual interviews. The purpose of the interview questions was to learn more about specific aspects of the curriculum implementation and to investigate how the teachers interpreted the student DIBELS results. In addition, the interviews provided an opportunity to explore the teachers’ perspectives, impressions, and experiences, which would add richness to the survey data. All interviews were scheduled at a convenient time for both parties and were approximately 30 minutes in length. Because the interviews were semi-structured, and open-ended, questions were designed to generate rich, textural evidence of the teachers’ implementation experience. The teachers’ voices would be heard using direct quotations from the interviews.

**Student DIBELS results.** Finally, student level data were collected from the three benchmark DIBELS tests administrations (fall, winter, spring). The data from the following indicators were analyzed: Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF). Table 6 details the DIBELS score ranges and their corresponding risk level for future reading success.
Table 6
Benchmark Assessment Periods and Score Status Ratings

<table>
<thead>
<tr>
<th>DIBELS Test</th>
<th>Fall (Sept)</th>
<th>Winter (Jan)</th>
<th>Spring (May)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISF</strong></td>
<td>Scores</td>
<td>Status</td>
<td>Scores</td>
</tr>
<tr>
<td></td>
<td>0 - 3</td>
<td>At Risk</td>
<td>0 - 9</td>
</tr>
<tr>
<td></td>
<td>4 - 7</td>
<td>Some Risk</td>
<td>10 - 24</td>
</tr>
<tr>
<td></td>
<td>8 and above</td>
<td>Low Risk</td>
<td>25 and above</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LNF</strong></td>
<td>0 - 1</td>
<td>At Risk</td>
<td>0 - 14</td>
</tr>
<tr>
<td></td>
<td>2 - 7</td>
<td>Some Risk</td>
<td>15 - 26</td>
</tr>
<tr>
<td></td>
<td>8 and above</td>
<td>Low Risk</td>
<td>27 and above</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PSF</strong></td>
<td>Not administered during this assessment period.</td>
<td>At Risk</td>
<td>0 - 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some Risk</td>
<td>10 - 34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Risk</td>
<td>35 and above</td>
</tr>
<tr>
<td><strong>NWF</strong></td>
<td>Not administered during this assessment period.</td>
<td>At Risk</td>
<td>0 - 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some Risk</td>
<td>5 - 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Risk</td>
<td>13 and above</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The raw scores of student scores from Tools curriculum based classrooms were analyzed for their level of risk and then compared with the national norms. These analyses were used to answer the third research question that was an investigation of the attained or the learned curriculum.

**Step #4: Analyze and interpret data.** Miles and Huberman (1994) define data analysis, “as consisting of three concurrent flows of activity: (1) data reduction; (2) data display; and (3) conclusion drawing/verification” (p. 10). Figure 2 shows the interrelation of the three flows of activity that follow the initial data collection. Note that the arrows imply an iterative process.
Table 7 shows an overview of the research questions, the data collected, and how that data were analyzed in this research study.

Table 7
Research Questions, Data to be Collected, and Analyzed

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data Collected</th>
<th>How Data Analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) How does the Tools of the Mind curriculum develop students’ literacy skills and understandings through play?</td>
<td>Information from program curriculum</td>
<td>How and when literacy learning is intended to be developed through play/activities across the year.</td>
</tr>
<tr>
<td>2) How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented?</td>
<td>Teacher survey responses; individual interviews</td>
<td>Likert-type scale responses; implementation fidelity and student achievement; interview data coded for themes</td>
</tr>
<tr>
<td>3) What is the impact of the Tools of the Mind curriculum on student DIBELS data?</td>
<td>DIBELS administrations in 2010-2011</td>
<td>Student scores compared to national norms for each of three benchmark administrations.</td>
</tr>
</tbody>
</table>
Miles and Huberman (1994) suggest that data reduction, or coding, is an essential part of the data analysis. Data reduction helps to sharpen, sort, focus, discard, and organize the data in a way that allows for conclusions to be drawn and verified. They add that data can be reduced and transformed through means such as selection, summary, paraphrasing, or through being subsumed in a larger pattern.

In this research study, the data sources coded by the researcher were the Tools of the Mind curriculum and the teacher responses to interview questions. The student results on each of the benchmark DIBELS administrations were coded according to the risk categories connected to individual student performance as specified by the national norms published by the DIBELS authors. Table 8 provides an overview of the coding that was done to reduce the data from each source.

Table 8
Sources of Data and Strategy for Data Reduction and Coding

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Reduced or Coded By</th>
<th>Type of Coding Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools of the Mind Curriculum</td>
<td>Researcher</td>
<td>Descriptive: Mapping to National Reading Panel early literacy topics; DIBELS indicator content</td>
</tr>
<tr>
<td>Teacher surveys and interviews</td>
<td>Researcher</td>
<td>Inferential and Explanatory: Coded for themes and commentary on fidelity of implementation and how the curriculum prepares students for DIBELS tests; then analyzed for patterns</td>
</tr>
<tr>
<td>DIBELS data</td>
<td>DIBELS publisher</td>
<td>Level of Risk associated with student score: Low Risk, Some Risk, At Risk</td>
</tr>
</tbody>
</table>

**Coding curriculum.** The Tools of the Mind curriculum was analyzed and coded by the researcher for the ways in which the curriculum is designed to teach the students the skills tested by the DIBELS. A coding system was developed that consisted of general categories that included a mapping of the curriculum to early literacy objectives, how the curriculum component
was used to establish foundational literacy skills, and the scope and sequence of what was to be taught. These were all displayed in tabular format. Miles and Huberman (1994) call these “descriptive codes” in that they “entail little interpretation” (p. 57). This type of coding attributes a class of phenomena to a particular part of the curriculum (Miles & Huberman, 1994).

**Descriptive statistical analysis of surveys and coding of interview data.** The teacher survey responses were analyzed and frequencies calculated for the responses within each question category. The teacher interviews were tape recorded as they were conducted, transcribed, and then coded using open and axial coding to first assign descriptive codes and then inductively develop categories and uncover themes (Creswell, 1998). The survey, and an analysis of the DIBELS data, informed the design and content of the interview questions.

The open coding was an initial examination of the data and a beginning step in assigning categories and themes. With the axial coding, connections among teacher responses that were similar or dissimilar emerged. Moving away from specific questions, general overall categories and themes within the commentary emerged. Miles and Huberman (1994) call this type of analysis one that is more “inferential and explanatory” (p. 57). Miles and Huberman further note that “codes can happen at different times during the analysis; some get created at the start, and others follows – typically the descriptive ones first and the inferential ones later” (p. 58). This analysis resulted in the integration of the teacher survey responses with the teacher interview responses to illustrate the teachers’ impressions, perspectives, and experiences.

**Statistical Analysis of DIBELS results.** The DIBELS results were analyzed for each of the three administration periods: fall (September), winter (January), and spring (May). The student-level results for students in the Tools based classrooms map to a risk level based on the national DIBELS norms. Simple descriptive statistics were generated for each of the indicators
at each benchmark testing period. This information was presented in tabular and graphical formats to support analysis and discovery of student performance over time.

Noting that Miles and Huberman (1994) contend that data display is a critical and often underutilized means of analysis, charts and graphs were used to discover patterns, and possible connections. Time-ordered displays showed growth over the school year within each of the DIBELS indicators. This was a secondary analysis of this data and therefore, the statistics provided practical significance in relation to how the major stakeholders (teachers, early childhood director) understood them and interpreted them.

**Displaying data.** Data display is the second major activity that Miles and Huberman (1994) recommend. This involves taking the reduced data and displaying it in an organized, compressed way so that conclusions are easy drawn. These authors explain that “humans are not powerful processors of large amounts of information” and that “extended text can overload humans’ information-processing capabilities” (Miles & Huberman, 1994, p. 11). They further explain that good displays are “a major avenue to valid qualitative analysis” (Miles & Huberman, 1994, p. 11). As with data reduction, Miles and Huberman (1994) suggest that the creation and use of displays is part of, not separate from, the data analysis task. Tables, and line graphs were used to display data.

**Drawing conclusions.** Finally, conclusion drawing and verification completes the analytical tasks of the qualitative researcher. It is at this point that the researcher begins to decide what things mean. Identifying regularities, patterns (differences/similarities), explanations, possible configurations, causal flows, and propositions are all included in this part of the process. The meanings that emerge from the data are "tested" or verified for their plausibility, confirmability, and robustness. These factors contribute to the validity and reliability of the data interpretation.
These three stages of data analysis (i.e. data reduction, data display, conclusion drawing and verification) form an interactive, cyclical process. As Miles and Huberman (1994) illustrate, the coding of data (data reduction) leads to new ideas on what should go into a matrix (data display). As the matrix is filled out, preliminary conclusions are drawn, but they can lead to a decision, for example, to add another column or row to the matrix to test a conclusion. In this way, qualitative data analysis can be a continuous, iterative activity.

**Data analysis techniques.** Within the process of analyzing data, the following techniques were investigated: 1) Pattern matching: This technique compares an empirically based pattern with a predicted one. In this study, the DIBELS results from the play-based curriculum were compared with the national norms. The authors of the DIBELS publish norms every year and they are available, free-of-charge, through their website (https://dibels.uoregon.edu/); 2) Explanation building: This technique was used to explain a
phenomenon, or how or why something happened. In this research study, the DIBELS results were compared with the methods used to develop literacy in the play-based curriculum to explain how or why the results were as they were; and 3) Logic modeling: As another form of pattern matching, this technique consisted of matching empirically observed events to theoretically predicted events. In this research study, the DIBELS results were qualified by the teacher survey responses and fleshed out via the interview commentary that explained the teachers’ perspectives on how well the curriculum prepared students for each DIBELS indicator.

Once the data were analyzed, then the data were interpreted to answer and/or provide commentary about the research questions. In addition to documenting what occurred, implications for classroom practice, district decision-making, and limitations were also noted.

**Step #5: Use.** A final report of this research study was shared with the participating district. Ideally, it will be used by the participating district to help inform their use, implementation, and assessment of the Tools of the Mind curriculum.

**Validity and Credibility**

Issues that related to validity and credibility of this research study were addressed. Creswell (2009) states that validity “is based on determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account (p. 191). Lincoln and Guba (1985) suggest that trustworthiness of a research study is important to establishing its worth. Trustworthiness involves establishing:

1. Credibility, which refers to the confidence in the truth of the findings;  
2. Transferability, which shows that the findings have applicability in other contexts;  
3. Dependability, which is an assessment of the quality of the processes of data collection, data analysis, and resultant theory generation; and
4. Confirmability, which relates to how neutral the findings are and not shaped by researcher bias, motivation, or interest.

In order to support the trustworthiness of this research study, techniques recommended by Lincoln and Guba (1985) for three of the four criteria were employed. To establish credibility, multiple sources of data accessed across a prolonged period of time (the school year) were collected. Additionally, the strategies of peer debriefing and member checking were leveraged. Dr. Charles Depascale provided peer debriefing by reviewing and asking questions about the study so that the account would resonate with people other than the researcher (Creswell, 2009, p. 192). Member checking involved “taking the final report or specific descriptions” (Creswell, 2009, p. 191) back to Oceanside School District’s teachers and director of early childhood. The objective of this strategy is to make sure that study participants had an opportunity to confirm that the interview data and/or report were accurate.

The technique that was used to establish dependability and confirmability was an independent audit of research methods by a competent peer (Lincoln & Guba, 1985). An audit trail was established through maintaining all data that was collected to address the research questions. Transferability was not directly addressed given the narrow scope of the investigation, and the specifics of the curriculum implementation. However, this study does offer the field of education a point of reference where the Tools of the Mind curriculum has been used.

**Protection of Human Subjects**

This research study received approval from the Northeastern University Institutional Review Board (IRB) on December 16, 2010 (Appendix G). The study involved a secondary analysis of data by using DIBELS data that were previously collected. The district provided the
data after having removed all student identification information. Individual students were
identified only by a district-generated student number, created for the purposes of sharing the
data for this research study. In addition, the teachers were invited to participate in the voluntary,
anonymous, web-based survey to solicit their assessment of the extent to which they
implemented the curriculum with fidelity. Then, if they responded to the initial invitation to
participate in the teacher survey, they were invited to participate in an individual interview. The
teachers were assured in the recruitment letter that their decision about participation would have
no effect on their standing in their school and/or district (Appendix E). To ensure their
anonymity, pseudonyms were used for the teachers and the early childhood director who were
interviewed.
Chapter 4: Report of Research Findings

The problem of practice that was the impetus for this study emerged as a side-effect of the No Child Left Behind Act of 2001 and the increased accountability of school districts for academic achievement. With increased emphasis on academics, this raised the question as to whether or not kindergarten classrooms have evolved into learning environments that are more academically-focused at the exclusion of developmentally appropriate teaching practices and play-based learning. Using the theoretical lenses of Lev Vygotsky’s theory of play-based learning, and Robert Marzano’s research on curriculum implementation, the following research questions were developed:

1) How does the Tools of the Mind curriculum develop students’ literacy skills and understandings through play?

2) How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented? and

3) How do students who have experienced the Tools curriculum perform on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS)?

Marzano’s (2003) work operationalizes Vygotsky’s early childhood learning theory and provides a structure for accessing data that supports the evaluation of the intended curriculum, how closely that curriculum was implemented to the way in which it was designed, and what type of learning outcomes emerged. Three questions were developed to work together to investigate the intended, the implemented, and the learned curricula in one district’s implementation of an alternative kindergarten curriculum to that which is typically seen in today’s classrooms. This alternative curriculum is a Vygotskyian, play-based curriculum called Tools of the Mind (Bodrova & Leong, 2008).
Site and Participants

This site and these participants were a sample of convenience due to the accessibility of the school district and the difficulty in gathering the necessary data, which requires a district that implements a play-based kindergarten curriculum.

The research site was a regional school district in a rural, coastal part of New England. The student population was predominantly white and non-low-income. The school district has four elementary schools. District leadership agreed to participate in the research study with the researcher’s assurance of anonymity. For this reason, the district will be known as the Oceanside School District.

During the 2010-2011 school year, two of the four schools elementary schools of the Oceanside School District implemented the Tools of the Mind curriculum as a pilot. The two schools that implemented the Tools curriculum each housed two kindergarten classrooms. The combined total from the four classrooms was approximately 50 students. The district provided the research with these students’ DIBELS benchmark data for fall, winter, and spring.

The four teachers, and the director of early childhood, who participated in the study were promised anonymity in an effort to get the most candid responses from them regarding their implementation, perspectives, and experiences. Because of the promise of anonymity, pseudonyms were used. In order to provide some contextual and professional perspective on the teachers’ commentary, the researcher asked each participant to provide her educational background, and number of years teaching in kindergarten and/or early childhood settings. Table 9 summarizes this information.
Table 9

Overview of education and experience of participating staff members

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Role</th>
<th>Educational background</th>
<th>Years of experience in childhood settings</th>
</tr>
</thead>
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<tr>
<td>Eve</td>
<td>Director of early childhood</td>
<td>Doctoral degree</td>
<td>35</td>
</tr>
<tr>
<td>Ann</td>
<td>Teacher</td>
<td>Master’s degree</td>
<td>10</td>
</tr>
<tr>
<td>Beth</td>
<td>Teacher</td>
<td>Master’s degree</td>
<td>22</td>
</tr>
<tr>
<td>Cindy</td>
<td>Teacher</td>
<td>Master’s degree</td>
<td>11</td>
</tr>
<tr>
<td>Deb</td>
<td>Teacher</td>
<td>Bachelor’s degree</td>
<td>28</td>
</tr>
</tbody>
</table>

From the information provided, the teachers implementing the Tools curriculum were well educated and very experienced in early childhood, and specifically kindergarten, classroom settings.

Methodology for Research Study

Using the six-step protocol developed by the Program Development and Evaluation Unit of the University of Wisconsin Cooperative Extension campus, an evaluation was conducted to determine the outcomes associated with the implementation of the Tools of the Mind curriculum. The protocol used is shown in Figure 1.

What follows is an explanation of each of the five steps in this protocol and how they were addressed in this particular research study.

Step #1: Engage stakeholders. Stakeholders in the participating district were engaged through the inquiry of whether or not they would be interested in having their district’s implementation of Tools of the Mind the subject of a doctoral research study. The director of early childhood as well as the four teachers who implemented the Tools of the Mind curriculum during the 2010-2011 school year were recruited to participate.
**Step #2: Focus.** A logic model was created to identify the inputs (resources), activities, outputs and outcomes that made up the Tools of the Mind curriculum implementation (United Way, p. 4). Table 3 shows how these components combined to stimulate and support the desired changes.

**Inputs as data sources.** Each of the inputs was a data source that enabled one of the three research questions to be answered. First, the actual Tools of the Mind curriculum, contained in five manuals, was dissected and analyzed to discover the ways in which play, literacy skill development and self-regulation were developed and used across the school year to support kindergarten study learning. This enabled the intended curriculum to be understood as well as the first research question that explored how the Tools of the Mind curriculum developed students’ literacy skills and understandings through play.

Second, the kindergarten teachers were surveyed to discover if the teachers’ implementation of the Tools of the Mind curriculum reflected the curriculum as it was intended to be implemented. This enabled the enacted curriculum to be understood as well as the second research question that explored how well the teachers’ implementation of the Tools of the Mind curriculum matched the curriculum as it was intended to be implemented. In addition, open-response questions were included that provided teachers with the opportunity to comment on how the DIBELS tests reflect literacy skills learning as taught through the Tools of the Mind curriculum. This provided additional data that explained how well the DIBELS matched the literacy skills that the students had the opportunity to learn.

Finally, the kindergarten student results from each of the three benchmark DIBELS test administrations served as outcome indicators to document student progress toward the outcome target of having all students on grade level for literacy learning as they end their kindergarten year. This enabled the attained curriculum to be understood as well as the third research
question that explored how students who experienced the Tools of the Mind curriculum perform on the DIBELS.

**Step #3: Collect data.** Data were collected from three sources in this study. The first source was the Tools of the Mind kindergarten curriculum. The curriculum was analyzed for how the different curriculum components supported early literacy learning determined as essential by the National Reading Panel Report (2000) (Appendix A).

The second source was the teachers who taught the Tools curriculum. Through a voluntary, anonymous, electronic, Likert-type survey, the kindergarten teachers provided data about the fidelity of their curriculum implementation. Additionally, they responded to questions about the Tools curriculum, DIBELS, and student learning that they saw in their respective classrooms (Appendix B). After these surveys and the student DIBELS data were analyzed, the teachers were interviewed to gather their individual perspectives and impressions that helped create a fuller, more complete picture of the teachers’ beliefs, behaviors, and evaluation of outcomes after implementing the curriculum and considering DIBELS results (Appendix C).

The final source was student DIBELS data. The participating district administered and collected results from the DIBELS three times of the year: fall, winter and spring. Student scores from the DIBELS ISF, LFN, PSF, and NWF were analyzed. The results generated by students immersed in the Tools curriculum classrooms were compared with the national DIBELS norms.

Figure 4 displays a flow chart of the research activities connected with each research question and how these interacted to complete the research study.
Research Question #1: The Intended Curriculum

Step 1: Analyzed the Tools curriculum for how early literacy developed through play.

Research Question #2: The Enacted Curriculum

Step 2: Used these results to inform development of teacher survey

Step 3: Administered web-based, anonymous teacher survey

Step 4: Analyzed teacher responses.

Step 5: Analyzed DIBELS results for risk and growth across time

Step 6: Designed interview questions using survey and DIBELS results

Step 7: Interviewed director of early childhood

Step 8: Interviewed four teachers individually

Step 9: Coded interviews, analyzed and interpreted results

Determined findings for RQ #2

Determined findings for RQ #3

Research Question #3: The Learned Curriculum

Tools of the Mind Outcome Evaluation

Figure 4 Research Activities Flowchart
Step #4: Analyze and interpret data. Miles and Huberman (1994) define data analysis, “as consisting of three concurrent flows of activity: (1) data reduction; (2) data display; and (3) conclusion drawing/verification” (p. 10). This is an iterative process (Figure 3 on page 61 is a schematic of this process). What follows is: 1) the analysis of the data connected with each of the study’s research questions, 2) the tabular or graphical displays used to support the interpretation of the data, and 3) the findings that resulted for this analysis and interpretation.

Research Question 1: Tools of the Mind Curriculum Analysis

The first research question was an investigation into the intended curriculum. The research question was intended to discover how the Tools of the Mind curriculum developed student literacy skills and understandings through play. In order to complete this investigation, this researcher pulled apart the five Tools of the Mind curriculum manuals and mapped the early literacy skills contained therein to the National Reading Panel (2000) priorities. The five areas of early literacy skills and understandings identified by the report of the National Reading Panel are phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Institute of Child Health and Human Development website). Table 4 provides an overview of the National Reading Panel findings.

This researcher further analyzed how the early literacy instruction in the Tools of the Mind curriculum is sequenced and how make-believe play, also known as dramatization, and other games-based activities are used within the curriculum to develop early literacy learning.

Coding curriculum. The Tools of the Mind curriculum was analyzed and coded by the researcher for the ways in which the curriculum is designed to teach the students the skills tested by the DIBELS. A coding system that attributed a class of phenomena to a particular part of the curriculum was developed by this researcher. This involved mapping the literacy components of
the Tools curriculum to early literacy objectives identified by the National Reading Panel as critical to early learning success. These results are displayed in Table 10. Additionally, descriptive codes were used to identify the classification of the literacy learning (precursor, fundamental, and conventions) that the curriculum attributed to specific literacy activities. These results are displayed in Table 11. Finally, a matrix was created to display the scope and sequence of the literacy learning across the school year. These results are displayed in Table 12. Using the work of Miles and Huberman (1994), these analyses used “descriptive codes” in that they “entail(ed) little interpretation” (p. 57). From these analyses and displays, three major findings emerged.

**Finding #1:** The Tools of the Mind curriculum is designed to instruct students in all five areas of early literacy skills and understandings identified by the report of the National Reading Panel: Teaching Children to Read (2000) as critical to reading success.

The five areas of early literacy skills and understandings that are identified by the report of the National Reading Panel are phonemic awareness, phonics, fluency, vocabulary, and text comprehension (National Institute of Child Health and Human Development website). Table 10 provides a mapping of the Tools curriculum to these and other elements of early literacy development.
Table 10
Mapping of Tools Curriculum and Other Elements of Early Literacy Development

<table>
<thead>
<tr>
<th>Tools of the Mind Curriculum Component/Activity</th>
<th>Oral Language (Receptive)</th>
<th>Oral Language (Expressive)</th>
<th>Vocabulary Development</th>
<th>Book Knowledge &amp; Appreciation</th>
<th>Print Knowledge</th>
<th>Phonemic Awareness</th>
<th>Phonics</th>
<th>Reading, Decoding, &amp; Word Recognition</th>
<th>Comprehension &amp; Reading</th>
<th>Writing</th>
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<td><strong>SELF-REGULATION ACTIVITIES</strong></td>
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</table>
Finding #2: The Tools of the Mind curriculum is designed based on developmental trajectories for early literacy skills and understandings categorized as precursors, fundamentals, and conventions.

Intentional design: multiple pathways to support literacy development. The designers of the Tools curriculum suggest that today’s students “lack much of the precursor knowledge for reading that is essential to decoding and encoding skills” (Leong, Bodrova, & Hensen, 2008, p. 76). They further suggest that teaching today’s kindergarten students requires a “carefully constructed approach that builds the missing precursors at the same time it is teaching the actual decoding/encoding skills” (Leong et al., 2008, p. 76). Because of the complicated nature of learning to read, the Tools curriculum approach teaches reading and writing in several different and simultaneous ways. “Skills that cannot be deconstructed, such as producing a written sentence, are scaffolded using Vygotskian tactics. Freestanding skills, such as letter names, are taught through repeated exposure in a variety of contexts and practiced to the point of becoming automatic” (Leong et al., 2008, p. 76).

The Tools curriculum divides literacy development into precursors, fundamentals, and conventions. Each skill category is taught differently in terms of the timing, the type of instruction, and the scaffolding needed to teach it most efficiently. Precursors are skills that children must have before they can begin to read and write. The Tools curriculum identifies these as “underlying cognitive skills, oral language, and metalinguistic awareness, particularly phonemic awareness” (Leong et al., 2008, p. 78). Fundamentals are the “elements of decoding and encoding that do not change within a language; for example the correspondence between sounds and symbols in alphabetic languages” (Leong et al., 2008, p. 78). Finally, conventions are “agreed-upon ways of representing text” (Leong et al., 2008, p. 78).
Table 1 was created by the researcher, based on information provided by the curriculum developers, to illustrate a scope and sequence of key curriculum components and activities and how each is used (as a precursor, fundamental, or convention) to contribute to the literacy development across the year. What follows is an explanation of other curriculum components and how they contribute to early literacy skill development.

**Written speech as a tool.** For Vygotskians, a child who can read and write is “more than merely a child who can read a book or write down words that are spoken” (Leong et al., 2008, p. 76). From the Vygotskian perspective the child who can read and write actually thinks differently from a child who has not yet mastered these skills. “Written speech makes a child’s thinking more explicit, forcing it into a logical sequence and leaving a physical, tangible trace that would not exist without writing” (Leong et al., 2008, pp. 76-77). Writing is a tool for thinking in that it helps a child remember, as it preserves what happened.

To introduce and reinforce the idea of written speech as a tool for thinking, the Tools curriculum is designed to teach children the purposeful use of reading and writing and using these authentically. The purpose can be functional, such as “to record thoughts, plan what she will do, or help the class remember what to bring” (Leong et al., 2008, p. 77). The purpose can be communicative, such as “explaining your opinion about a story you have read or write a note to tell someone else something” (Leong et al., 2008, p. 77). This contrasts with the type of literacy-based activity in a more traditional (non-Tools) classroom that would use worksheets for students to practice skills. Worksheets do not place the language in a purposeful context, nor do they emphasize “language as a tool for thinking” (Leong et al., 2008, p. 77).
### Table 11

**Mapping of Curriculum to Literacy Skill Development Category as documented in Tools of the Mind Curriculum Manuals**

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<td><strong>SELF-REGULATION ACTIVITIES</strong></td>
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The relationship of writing to oral speech. Vygotskians argue that the best place to begin literacy instruction is by teaching children the relationship between writing and their own oral speech (Leong et al., 2008, p. 77). Literacy begins when a child can make the connection between what he or she says and what she or he writes. Teachers can model this process but it must be internalized by the child for learning to occur.

“Vygotsky noted that in the young child, the ability to use oral speech is much further advanced than the ability to read and write” (Leong et al., 2008, p. 77). “Young children begin to ‘write’ independently much earlier than they begin to read. This writing has the connection between the intended message and the marks they make to embody it” (Leong et al., 2008, p. 77). Research has confirmed that young children’s invented spellings (an indication of their internalization of writing) outpaces their ability to read text (Richgels, 1995). This is why the Tools curriculum emphasizes writing. Writing makes a connection between letter sounds and symbols in a way that is much deeper than what happens when children rotely memorize the letter and the sound (Luria, 1983).

Understanding the connection of play to kindergarten learning. Through the theoretical lens of Vygotsky, the importance of play as a vehicle for kindergarten learning comes into focus. Vygotsky believed that children co-constructed their learning and that learning leads the development of cognitive skills. He focused on how children’s imaginative make-believe play is the process by which many cognitive skills are developed. He also believed that the self-regulatory skills that are necessary to sustain mature make-believe play are critical to academic success. The Tools of the Mind curriculum program is “based on the Vygotskian idea that the goal of early education is to build children’s self-regulation as they build content knowledge. This approach means that children’s ability to learn, as well as what they learn, is affected” (Leong, et al., 2008, p.8).
Intentional make-believe play as the foundation of self-regulation. Vygotsky argued that the development of self-regulation signaled the emergence of a uniquely human set of competencies, or higher mental functions. Until these higher mental functions develop, young children are reactive, they do what jumps into their minds first; they act first and think later. Self-regulation allows children to stop being “slaves to the environment” and become “masters of their own behavior” (Vygotsky, 1978 cited in Leong et al., 2008, p.40). Children who are self-regulated can think ahead, be reflective, and are aware of their own thinking processes as well as their emotions.

Although children begin self-regulation by absorbing the teacher’s rules, learning to follow rules is not sufficient for their self-regulation to develop. To develop fully children’s self-regulation, Vygotskians have found that children have to participate in three different types of interactions (Elkonin, 1978, cited in Leong, et al., 2008, p. 41):

• Being regulated by another person—“teacher regulation” or “peer regulation”
• Regulating another person—“other-regulation”
• Regulating oneself, voluntarily and independently from others—“self-regulation”

Within the Tools curriculum, every activity includes self-regulation components. The focal activity for self-regulation development is the mature, intentional make-believe play (also referred to as “dramatization”). Additionally, games and other activities target specific aspects of self-regulation, as do positive classroom interactions, and specially constructed learning activities. The purposefulness and the benefit of this aspect of curriculum supports the research that suggests that self-regulation is critical to academic success (Matthews, et al.; Ponitz, et al.; Rimm-Kaufmann, et al.; Carlson & Wang).

Understanding the important role of intentional make-believe play. Vygotsky believed that the activity during which young children are most likely to learn how to self-
regulate is the specific kind of play called intentional make-believe play, sometimes also called intentional pretend play or intentional dramatic play (Bodrova & Leong, 2007). The Tools kindergarten curriculum engages children in intentional make-believe play, taking their themes from books, so the kind of play they engage in is called “dramatization.”

Intentional make-believe play provides a context in which to practice the three interactions (regulation by others, other-regulation, and self-regulation) that are necessary for the development of self-regulation in a manner in which other activities do not. Children have to go along with the group plan, tell others when they are not following the plan, as well as “voluntarily restricting their actions in order to remain in the play” (Leong et al., 2008, p. 60). Moreover, children practice self-regulation using physical, cognitive, and social-emotional skills. Contrary to seeing play as an activity in which it is a free-for-all, Vygotskians believe that mature, intentional make-believe can provide learning that is critical for future academic success.

In order for play to be considered mature, or intentional, it must have the following components (Elkonin cited in Leong et al., 2008, p. 42):

- Be intentional through play planning
- Have explicit roles with implicit rules that govern actions, “feelings,” and speech
- Make minimal use of realistic props; use of symbolic props
- Have an extended timeframe
- Include the extensive use of language
- Have an imaginary, pretend scenario that is agreed upon and coordinated between the players

In addition, the Tools curriculum integrates self-regulation, phonemic awareness, and alphabetic principle learning into games that allow the student to specifically hone in on and practice these skills. For example, Movement Games such as the Freeze Game, or Pattern
Movement Games support the development of physical self-regulation. As self-regulation activities, these games require the children to “selectively inhibit some behaviors and act on others” (Leong et al., 2010a, p. 39). For example, in the Freeze Game, the children view a series of stick figure representations of complex individual and partner poses as they dance to music and then freeze in the positions on the card the teacher is showing when the music pauses. As the kindergarten year goes on, this game gets increasingly complex, with variations that add two or more steps, assign colors to particular positions, and require the students to consider more than one source of data in their decision-making. In the Pattern Movement Game, the children view a series of shapes on a strip of paper shown to the class (e.g. triangle-circle-triangle-circle-triangle-circle) and are told the movement they are to do as the teacher points to each shape on the strip. The purpose of these games is to practice physical self-regulation by resisting the urge to move until the right moment, intentionally act based on a picture command, as well as following complicated directions.

**Intentional make-believe play as a vehicle to literacy development.** *An emphasis on oral language.* The Vygotskian perspective of learning requires social interaction and communication. In the Tools curriculum, children are encouraged to talk. This contrasts with a traditional classroom whereby students may be allowed to talk only when they have raised a hand and have been called on by the teacher. In a classroom using the Tools curriculum, the pedagogical approach engages students in talking as a means to thinking through their ideas. This emphasis on oral language development is evident in the students talking about something they plan to act out in make-believe play, discussing their thoughts or connections with a story that was read, or when they are activating prior knowledge.

**Vocabulary development.** The Tools curriculum develops vocabulary through techniques that encourage the repetition of new vocabulary in children’s interactions with one
another and the teacher; “during conversations, dramatization, Center Planning interactions, drawing/writing” (Leong et al., 2008, p. 80). Centers are set up so that vocabulary use will be enhanced. Props for make-believe play may not always be an exact replica of what they are imagining. Children have to use the vocabulary words in order for peers to know what it is. The Tools curriculum designers explain (Leong et al., 2008):

An example might be when children are re-enacting a scene from a Magic Tree House book where they are in the Amazon and there are pythons all around and instead of using replicas of real snakes, they are using towels. Pretending that the towel is a python helps to develop vocabulary use in a way a replica of a snake would not. A replica of a snake is obvious to everyone that it is a snake, no one has to label it. (p. 80)

Vocabulary development is further extended and reinforced through the use of tongue twisters, silly sentences, jokes, and riddles that are designed to “encourage children to explore words more deeply” (Leong et al., 2008, p. 80). These games help children to experience the complexity of language (i.e. multiple meanings for words, alliteration, words in context).

**Listening comprehension development.** Through dramatization, or make-believe play, children develop their understanding of stories. They talk about the stories and act them out during the daily dramatization time. “Acting out the story prompts elaboration of the story, which in turn improves the child’s comprehension by requiring him to say or envision the story in another way” (Leong et al., 2008, p. 81). The dramatization is to listening comprehension as “manipulatives are to mathematics concepts” (Leong et al., 2008, p. 81). The Tools curriculum designers suggest (Leong et al., 2008):

…when children act out the story, they express their own understanding of the storyline, the characters, the social relationships between the characters, their feelings, and the events that unfold. Dramatization allows children to play with aspects of the story and to
infer, through acting out the effects of their inferences: What if the troll in Three Billy Goats Gruff had been nice? What would have happened if the first goat to cross was the biggest Billy Goat?” (p. 81)

This is an example of Zaporozhet’s (1986) concept called the amplification of learning. The activity enhances, or amplifies, the learning by taking what is known and asking children to engage in problem solving or thinking about the situation from an alternative perspective.

The Tools curriculum also uses a technique called Story Grammar, which is a structural analysis of the story to support children’s comprehension. This is designed based on the Vygotskian idea that cognitive structure helps children to understand a story. In Story Grammar, children learn about the concepts of main character, point of view, beginning, middle, and end of stories, and how stories can be same-but-different takes on a single situation (Leong et al., 2008, p. 81). As the year progresses, chapter books are introduced. Chapter books increase the cognitive demands on children’s ability to remember the action that has taken place and make predictions about what will happen next. Moreover, chapter books with few pictures require children to visualize the action in their minds. Leveraging this visualization skill as a primary comprehension strategy is critical to future reading success. Appendix D contains a scenario that illustrates how the dramatization is used in the Tools curriculum to comprehensively support literacy development.

**Metalinguistic awareness: Understanding language as a “system.”** Vygotskians believe that the ability to think about language is a key precursor to learning to break the code of reading (Smirnova and Gudareva, 2004, cited in Leong et al., 2008). The Tools curriculum uses a technique called Scaffolded Writing, where a line is used as a mediator for an individual word. The mediator helps to make real the concept of a word in spoken speech by drawing a line for each word in the sentence (Leong et al., 2008, p. 82). Figure 5 shows an example of this
technique. This approach helps children learn how to break their speech into discrete words while they simultaneously learn the basics about writing words and conventions for writing words and sentences.

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\text{We} & \text{are} & \text{going} & \text{to} & \text{play}.
\end{array}
\]

*Figure 5.* Example of the Scaffolded Writing technique.

**Phonemic awareness: A critical prerequisite to reading.** Phonemic awareness is being able to break words into sounds, isolate the sounds, and identify them in the order in which they appear in the word (Leong et al., 2008). The Tools curriculum initiates the learning of phonemes through Scaffolded Writing. In the Tools curriculum, “the link between sounds and symbols (letters) is the first connection made after the child understands there is such a thing as a word.” (Leong et al., 2008, p. 83). The Tools curriculum embeds the phonemic awareness development by using the child’s own words, thus creating a meaningful context. This is contrasted with the practice in a more traditional classroom where the teacher would select the word in a decontextualized situation. The Tools curriculum designers suggest that “because of the contextualized context, the underlying support of knowing the word, and the use of a special alphabet chart (the Sound Map), kindergarteners immersed in the Tools curriculum quickly learn that words are composed of phonemes” (Leong et al., 2008, p. 83). Moreover, they emphasize that Scaffolded Writing forces children to see words as composed of phonemes, and so it accelerates phonemic awareness (Papandropulou and Sinclair, 1974; Tummer, Pratt, & Herriman, 1984 cited in Leong et al., 2008). When children are trying to write, they are paying
close attention to the sounds in the words they want to use. This leads to more phonemic knowledge, which is tied directly to reading (Tummer et al.). Phonemic awareness precedes an understanding of phonics. Phonics is a method of teaching the way that sounds are represented with symbols. Research shows that having phonemic awareness is not sufficient for reading; children also have to understand alphabetic principle (Juel, 2006).

To provide students with more practice with the idea of alphabetic principle, or that words are made up of sounds in a specific order, the Tools curriculum uses a technique that was created by one of Vygotsky’s students, Daniel Elkonin. The Elkonin technique uses a box to stand for the sounds in the word. Literacy-based games such as Mystery Word Game, which is played a couple of times a week throughout the school year, support the development of phonemic awareness. After the teacher explicitly instructs the children on how to identify phonemes, they practice using Elkonin Box cards. These cards show a picture (e.g. a pig) and the corresponding phonemes are represented by a set of boxes under the picture. Figure 6 shows an example of an Elkonin Box. Moving from left to right, children would say one phoneme for each box, preserving the idea that there are sounds and also the order of the sounds in the word (Leong et al., 2008, p. 83).

![Figure 6. Example of an Elkonin Box.](image)

Other games. The Mystery Word Game extends phonemic awareness and alphabetic principle learning as the children use Elkonin Box cards to “figure out which pictures begin with
the same sound. They start with finding words that start with the same initial sound, the same ending sound, and then the initial sound that matches the ending sound” (Leong et al., 2008, p. 92). Other games that support phonemic awareness are chants, finger plays, poems, songs, Make a Rhyme, and Mystery Rhyme Game.

Games that support alphabetic principle and phonics include those that target word pattern decoding skills and sound-to-symbol correspondence. For example, the I Have-Who Has Word Patterns game is played in a small group with a deck of cards that has word patterns on the front and back of each card. A child begins by saying “I have __________” (whatever is on the front of the child’s card) and then turns the card over and asks “Who has__________?” The other children in the group look at the fronts of their cards to see if they have the match. They are the next player to get a turn. The cards are specifically designed so that at the end of the game, all the cards are matched and there are no cards left to be played. The goal is to play the game faster and faster, developing fluency with the card content (Leong et al., 2010b, p. 42). Additionally, there are three games that capitalize on students’ growing ability “to read words with word patterns in them and to write words with word patterns in them” (Leong et al., 2010b, p. 67). These games are Make Your Own Word, Can You Read This Word? and Write This Word. Through these games the children practice “learning about letter combinations that form larger words, so children can decode and encode patterns of words and not just individual letter sounds; by learning to build real and nonsense words” (Leong et al., 2010b, p. 72).

Learning to read: A primary phonics strategy. The Tools curriculum designers cite evidence from memory research that states “the amount of working memory needed for “chunked” information is much less than that needed for individual units” (Leong et al., 2010b, p. 72). Therefore using word patterns, or chunks, as an initial reading strategy takes up less
working memory than sounding out individual letters in a word. Leong et al. (2010b) cite the work of Seigneuric (2001) in their explanation:

Working memory plays a large role in how much a child can decode and comprehend. Often, at the beginning of learning to read, the child’s limited memory space is crowded with tasks that fluent readers have automatized and so waste little space on things such as identifying each letter, remembering what the letter-sound correspondence is, remembering decoded sounds, and blending the sounds into a word that fits within the sentence to it makes sense. Anything that lightens the load on short-term memory gives the beginning reader more space for comprehension. Research shows that when working memory is overloaded in the reading process, the first thing that suffers is comprehension. (p. 72)

This is the Tools curriculum designers’ rationale for using word patterns as a primary phonics strategy in teaching kindergarten students to read. The Vygotskian approach to building words involves onset-rime combinations. The onset is the initial sound of the word; the rime refers to the word pattern that follows the initial sound. In a Tools environment, children learn to recognize the rime as a pattern, which speeds up their rate of decoding considerably (Leong et al., 2010b, p. 73). Sight words are learned as exceptions as the children need them. This Vygotskian approach is in contrast to a more traditional approach to phonics that might emphasize sound-to-symbol correspondence exclusively. Tools curriculum activities such as Scaffolded Writing, Buddy Reading, Individualized Reading, Word Puzzles Games, Mystery Games as well as Read-Write-Learn Write About, Write Along and Reading Response provide practice with identifying and using word patterns.
Given that the content of the curriculum builds early literacy learning through play, an analysis of the viability of the program was conducted.

**Finding #3:** The Tools of the Mind curriculum is viable given the time constraints of the school day.

Marzano’s research suggests that in order for a curriculum to be implemented fully, it must be viable given the time constraints of the school day. The term viable means that the content the teachers are supposed to address can actually be covered in the time available during the school day and across the school year. The next section addresses how the Tools curriculum uses the time available in a full-day kindergarten schedule and how the curriculum is rolled out across the school year.

**The Daily Schedule: Time for Literacy.** The Tools curriculum indicates that for a full-day kindergarten program, there should be a 90-minute literacy block daily. A 20-minute block of intentional, make-believe, dramatic play is included in this daily timeframe. In addition to the literacy block, the recommended schedule published by the authors of the curriculum, also includes, at the minimum, an additional 45 minutes a day for literacy-related activities in both large and small groups (Leong et al., 2010a, pp. 9-11). A sample schedule of a prototypical day is outlined in Figure 7.

The schedule shows that the curriculum embeds literacy learning across the school day using purposeful, structured play such as dramatization and games. Through the various components of the Tools curriculum, it fully addresses the elements of early literacy learning while simultaneously engaging students in techniques and/or activities that support the development of self-regulation skills that are important to academic success. Based on this overview of how the curriculum has been designed to be delivered, it appears to be a viable curriculum for the full-day kindergarten school day.
Figure 7. Prototypical kindergarten day as outlined by the Tools of the Mind curriculum (Leong, et al., 2008).

The curriculum roll-out across the school year. The Tools curriculum is based on developmental trajectories that determine that range of performance that kindergarten teachers would be likely to see from 5- and 6-year-old students. Curriculum components and activities are introduced at the beginning of the year and then made increasingly cognitively challenging based on the student’s Zone of Proximal Development (ZPD). Table 12 shows a scope and sequence of key curricular components and when they are taught, as reflected in curriculum implementation manuals.
Table 12  
Tools of the Mind Curriculum Scope and Sequence (Leong et al.)

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<tr>
<th>Tools of the Mind Curriculum Component/Activity</th>
<th>1st Qtr. (Sep-Oct)</th>
<th>2nd Qtr. (Oct-Jan)</th>
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</tbody>
</table>
The table shows that the curricular activities are introduced and maintained across the year. The curriculum designers suggest that the level of difficulty or cognitive complexity is enhanced as the year progresses. So, although the curricular component maintains its name, the content of the lessons develops according to developmental trajectories that are typical of kindergarten-aged students (Leong, et al. 2008).

**Research Question 2: Analysis of the Fidelity of Curriculum Implementation**

The second research question was an exploration of how well the teachers’ implementation of the Tools of the Mind curriculum matched the curriculum as it was intended to be implemented. In order to answer this question that addressed the enacted curriculum, the reflections, insights, and perspectives teachers who implemented the curriculum would need to be collected. Oceanside School District’s director of early childhood was interviewed to provide background on why the district decided to implement this curriculum in two of its four buildings, as well as to provide another stakeholder perspective on the outcome of this endeavor. The four teachers who were responsible for implementing the Tools curriculum were asked to reflect, via an anonymous electronic survey, on the fidelity of their implementation during the 2010-2011 school year. After compiling the survey results, the teachers were asked to participate in follow up, individual interviews.

**Development of the survey instrument.** The survey design was informed by Marzano’s (2003) survey work. It was intended to access teacher feedback on all aspects of the self-regulation and literacy-based instructional categories of the curriculum, as well as district support (which might be a factor in being able to implement fully the curriculum) and student achievement. The survey contained 45 Likert-type scale questions. Table 5 contains a breakdown of survey sections and number of questions contained in each.
Data collection procedures. The first step in data collection was to recruit the teachers via an e-mail message (See Appendix E). The participating district provided the work e-mail addresses of the four kindergarten teachers. The recruiting letter invited the kindergarten teachers to take part in this research study through a brief, anonymous, web-based survey. Directions, including the URL link to the survey, and a one-week response deadline, were incorporated into the first e-mail invitation that was sent on June 14, 2011. In response to the initial invitation, one teacher participated. Because of the anonymity of the survey participants, a second invitation was sent to the same four teachers inviting those who had not already done so, to participate (Appendix F). Once the follow up e-mail had been sent, all three remaining teachers responded.

Descriptive statistical analysis of surveys. Statistical frequencies of the teacher responses to survey questions were calculated. Using these and the results of the DIBELS analyses that were completed to answer Research Question #3, questions were developed to be used in follow up, one-on-one teacher interviews. Once the follow-up interviews were conducted with the teachers, the recordings were transcribed and the data analyzed using open and axial coding.

Development of the interview questions. The interview questions were developed after the teacher surveys were analyzed and after the DIBELS data were analyzed. These two sources of information informed the design of the questions. This researcher attempted to design questions that would solicit information to validate or refute survey responses as well as to explore responses to survey questions with specific, rich, detailed information about the teachers’ perceptions and experiences.

Coding of interview data. The teacher interviews were conducted, transcribed and then coded using open and axial coding to inductively develop categories and uncover themes (Creswell, 1998). The open coding was an initial examination of the data and a beginning step in
assigning categories and themes. With the axial coding, connections among teacher responses that were similar or dissimilar emerged. Moving away from specific questions, general overall categories and themes within the commentary emerged. Miles and Huberman call this type of analysis one that is more “inferential and explanatory” (p. 57). They further note that “codes can happen at different times during the analysis; some get created at the start, and others follow – typically the descriptive ones first and the inferential ones later” (p. 58). Table 13 reflects that results of the teacher interview coding. A complete transcript of the teacher interviews can be found in Appendix H.
Table 13
Coding Table of Teacher Interviews

<table>
<thead>
<tr>
<th>Research Question Focus</th>
<th>Inductive Categories</th>
<th>Teacher Responses</th>
<th>Reference (Teacher number.Question number.Question part)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum Related</td>
<td>Developmentally Appropriate Writing</td>
<td>1.1, 4.1, 3.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1, 2.1, 3.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Building Confidence</td>
<td>3.1b, 2.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaffolding</td>
<td>2.10a, 3.7</td>
<td></td>
</tr>
<tr>
<td>Self-Regulation</td>
<td></td>
<td>1.1, 2.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Aspects</td>
<td>2.9, 4.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Building Independence</td>
<td>1.9, 2.1d, 1.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Classroom Culture &amp; Team Work</td>
<td>1.9, 2.9, 2.10</td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>Buddy Components</td>
<td>3.7a, 4.7, 3.10b, 4.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Choral Response</td>
<td>3.11, 1.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students Talking more than Teacher</td>
<td>2.1e, 3.11, 1.12</td>
<td></td>
</tr>
<tr>
<td>Teacher Related</td>
<td>Dramatization</td>
<td>4.7, 4.9, 3.12d, 4.12a</td>
<td></td>
</tr>
<tr>
<td>Challenges</td>
<td>Magic Tree House Books</td>
<td>1.12, 2.12, 3.12, 4.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Positive impact on behavior</td>
<td>3.1b, 4.9, 3.12c</td>
<td></td>
</tr>
<tr>
<td>Teacher Related</td>
<td>Philosophy Match</td>
<td>1.2a, 3.12c, 4.13</td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td>Less stressed</td>
<td>1.13a, 3.13b, 4.13c</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Curriculum’s positive impact on students</td>
<td>1.13b, 2.13, 3.13c, 4.13d, 1.14</td>
<td></td>
</tr>
<tr>
<td>Achievement Related</td>
<td>Curricular components</td>
<td>1.2b, 3.2d, 4.2</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>Expectations and Implementation</td>
<td>2.2a, 3.2b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Switching Gears/Letting Go Difficulties</td>
<td>4.2, 3.2e</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2, 3.10</td>
<td></td>
</tr>
<tr>
<td>DIBELLS</td>
<td></td>
<td>4.5, 1.7, 2.7, 3.7, 4.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISF &amp; Writing</td>
<td>2.3, 4.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LNF &amp; Games</td>
<td>1.4, 2.4, 4.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PSF &amp; Writing</td>
<td>1.5, 2.5, 3.5, 4.5</td>
<td></td>
</tr>
<tr>
<td>Motivation &amp; Engagement</td>
<td>NWF &amp; Word Patterns</td>
<td>1.6, 2.6, 4.6, 2.11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4, 1.11, 2.12, 3.7, 2.7, 4.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning for Themselves</td>
<td>1.4, 1.11, 2.12, 3.7, 2.7, 4.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developmentally Appropriate</td>
<td>2.4, 1.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stress free learning</td>
<td>4.4, 2.11, 4.11, 1.1, 4.1a</td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
<td>1.7, 2.12, 3.9, 3.12d</td>
<td></td>
</tr>
<tr>
<td>Validity of DIBELLS</td>
<td></td>
<td>1.8, 2.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Validity – Yes</td>
<td>1.8, 3.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partial Assessment</td>
<td>1.8, 2.8, 3.8, 4.8</td>
<td></td>
</tr>
</tbody>
</table>
This analysis resulted in the integration of the teacher survey responses with interview responses. These data were used to convey the teachers’ voices, providing depth and detail about their feelings, perspectives, experiences and beliefs about the Tools of the Mind curriculum. Additionally, as another major stakeholder in the implementation of this alternative curriculum, the Oceanside School District’s early childhood director was interviewed about her perspective on the Tools of the Mind curriculum compared with her experience using traditional kindergarten curricula. A transcript and a coding table (Table 23) of her responses are included in Appendix I.

Three major findings emerged in response to Research Question #2.

**Finding #4:** The teachers reported that they implemented the curriculum with a high degree of fidelity to the way in which it was designed.

The teacher survey responses within the various sections of the 45-question survey are summarized in Table 14. Responses were predominantly in the “agree” or “strongly agree” categories. Responses that diverged from the majority were either explained with data collected via the individual interviews, or were anomalies. Detailed commentary on these divergent responses is provided within the presentation of the data analysis of the survey section in which they appear.
Table 14

Summary of Teacher Survey Responses by Section

<table>
<thead>
<tr>
<th>Teacher Survey Section</th>
<th>Table #</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum Implementation Summary</td>
<td>15</td>
<td>25%</td>
<td>43%</td>
<td>32%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total possible responses = 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Regulation Activities Summary</td>
<td>16</td>
<td></td>
<td>35%</td>
<td>65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Possible Responses = 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literacy Block Activities Summary</td>
<td>17</td>
<td>7%</td>
<td>2%</td>
<td>38%</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>Total Possible Responses = 40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scaffolded Writing Activities Summary</td>
<td>18</td>
<td>4%</td>
<td></td>
<td>33%</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Total Possible Responses = 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Literacy Activities Summary</td>
<td>19</td>
<td></td>
<td></td>
<td>33%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>Total Possible Responses = 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Achievement Summary</td>
<td>20</td>
<td>5%</td>
<td>5%</td>
<td>23%</td>
<td>65%</td>
<td>2%</td>
</tr>
<tr>
<td>Total Possible Responses = 44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What follows is a detailed accounting of the survey section questions and the frequencies of responses across all question types, followed by teacher interview commentary that help to provide a richer, deeper, and more textured understanding of their perspectives.

Table 15 reflects the teacher responses for Part A of the teacher survey that addressed general questions that related to curriculum implementation.
Table 15

Distribution of Teacher Survey Responses: Curriculum Implementation

<table>
<thead>
<tr>
<th>PART A: CURRICULUM IMPLEMENTATION (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>The district provided professional development/training sessions that were helpful to understanding how to teach the curriculum.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The district provided a curriculum coach that provided explicit feedback to help implement the curriculum activities with fidelity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The district provided me with time to discuss and collaborate with colleagues on curriculum implementation issues.</td>
<td>75%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The district provided me with time to make the manipulatives or items necessary to implement lessons with fidelity.</td>
<td>75%</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The district provided me with all the materials that I needed to implement the curriculum.</td>
<td>25%</td>
<td>75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This curriculum aligns with my personal philosophy of early childhood learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall, I held myself to a high degree of curriculum implementation fidelity with all the curriculum components.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Curriculum Implementation Section Summary
Total possible responses = 28

|                  | 25% | 43% | 32% |

Table 15 shows that all four teachers surveyed responded that they agreed (50%) or strongly agreed (50%) with the question on the alignment of the curriculum to their personal philosophy of early childhood learning. The results show that 4 out of 4 teachers agreed (50%) or strongly agreed (50%) with the statement that “overall, I held myself to a high degree of curriculum implementation fidelity with all the curriculum components.”

There were three questions within this section that generated negative responses. The questions asked the teachers if the district had provided them with materials, and enough time to collaborate with colleagues, and time to make the manipulatives necessary to implement the
lessons with fidelity. Three out of the 4 teachers responded that they did not have adequate time. This aspect of the implementation will be discussed fully under the Finding #5 section.

**Survey questions on self-regulation activities.** Table 16 reflects the frequencies of teacher responses to questions that focused on the curriculum’s self-regulation activities. These activities are designed to develop self-regulation, a skill that research has found supports future academic success.

*Table 16*

**Distribution of Teacher Survey Responses: Self-Regulation Activities**

<table>
<thead>
<tr>
<th>SELF-REGULATION ACTIVITIES (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I implemented the Attention Focusing Activities with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I implemented the Community Building Activities with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>I implemented the Physical Self-Regulation Activities with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I had classroom rules posted, and used them with my students in the manner suggested by the curriculum.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>My students engaged in Share the News with the frequency and duration that the curriculum recommended.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Self-Regulation Activities Section Summary</td>
<td></td>
<td></td>
<td></td>
<td>35%</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>Total Possible Responses = 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 16 shows that all the teachers agreed (35%) or strongly agreed (65%) that they implemented the various self-regulation activities with a high degree of fidelity and/or a frequency and duration recommended in the curriculum.

**Survey questions on literacy block activities.** These questions asked teachers to reflect on the early literacy learning components of the curriculum. Literacy learning is the focus of a 90-minute block daily, supplemented with other games and small and large group activities
outside this block. Table 17 reflects the frequencies of teacher responses to each of the questions in this subsection.

Table 17

*Distribution of Teacher Survey Responses: Literacy Block Activities*

<table>
<thead>
<tr>
<th>LITERACY BLOCK ACTIVITIES (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I implemented the Literacy Block with fidelity for 90 minutes a day across the school year.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>I implemented Story Lab, Scaffolded Writing, and Center Activities with the frequency and duration that the curriculum recommended.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>During Story Lab time, I was able to teach all the reading comprehension strategies the program expected and have students practice these strategies on an ongoing basis.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I used the dramatization component of the Story Lab as the curriculum recommended.</td>
<td></td>
<td></td>
<td></td>
<td>75%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>I used Scaffolded Writing to build sound-to-symbol correspondence.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>I provided tools like the Sound Map and the Vowel Map to students as the curriculum recommended.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>I used dramatization activities for approximately 20 minutes a day.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I arranged mixed ability groups of 4-6 students and/or conducted literacy games with the whole group to practice visual and auditory memory for 10-15 minutes a day.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I conducted literacy-oriented learning center activities for 60-70 minutes daily.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>I led small-group, differentiated instructional interactions at least 4 days a week to target literacy concept and skill development.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Literacy Block Activities Section Summary**

*Total Possible Responses = 40*

| | 7% | 2% | 38% | 53% |

Table 17 shows that all the teachers reported that they implemented the curriculum as it was designed and provided the students with the opportunity to learn the early literacy components as intended. In two questions that asked about small group heterogeneously-
grouped instruction, and small group homogeneously-grouped instruction, 1 out of the 4 teachers responded that she was “not sure” that she implemented the curriculum as it was intended.

Two out of the 4 teachers reported that they did not implement the dramatization component of the literacy block for 20 minutes a day. Ann explained “…I did find that in the beginning of the year the dramatization piece was challenging. When the kids would go to their centers and act things out, I felt like I couldn’t get to, or be in, as many places as I wanted to…” (Personal communication, September 30, 2011). However, Deb reported “…I loved the dramatization. The dramatization piece was very key for all the kids. That piece, starting the year so heavily with the dramatization of the fairy tales, set the tone” (Personal communication, August 26, 2011).

Survey questions related to Scaffolded Writing. Table 18 reflects the frequency of teacher responses to the section of survey questions that addressed the use of Scaffolded Writing, one of the pivotal strategies leveraged in the Tools of the Mind curriculum to teach literacy.

<table>
<thead>
<tr>
<th>SCAFFOLDED WRITING ACTIVITIES (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I implemented Message of the Day with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I implemented Elkonin Boxes I-IV with a high degree of fidelity.</td>
<td></td>
<td></td>
<td>75%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I implemented Center Planning writing with a high degree of fidelity.</td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I used the dynamic assessment box to document the student’s independent level of writing development and the student’s level of writing development when assisted, with a high degree of fidelity.</td>
<td></td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I conducted the Read-Write-Learn activities (Storyboards, Chapter Summaries, and Write About) with a high degree of fidelity.</td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I used the Write Along of Silly Sentences, Tongue Twisters, Riddles and Jokes with fidelity.</td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scaffolded Writing Activities Section Summary
Total Possible Responses = 24

| | 4% | 33% | 63% |
Scaffolded Writing is a critical component in the process of early literacy learning in the Tools curriculum. Table 18 shows that all the teachers agreed (33%) or strongly agreed (63%) that they had implemented these activities with a high degree of fidelity. One response out of the 24 total possible responses reflected that one of the teachers disagreed with the statement that asked about the fidelity of implementation of the dynamic assessment that is part of the writing component. Additional information about this issue did not emerge in any interview. In all the interviews teachers were enthusiastic about the writing component. Cindy explained the centrality of writing in the Tools curriculum:

…starting from day one with them thinking that way (about writing). Thinking about what their message is, what their plan is and starting where they are at and using the Sound Map and the dynamic assessment and be able to give one on one scaffolding – one on one support to bring them along in that area. (Personal communication, September 15, 2011)

These comments reflected the majority perspective citing the writing component as one of the strengths of the program.

**Survey questions regarding other literacy activities.** Table 19 reflects the frequency of teacher responses to the survey questions that asked about the level of implementation fidelity of other literacy activities that support the primary curricular components.
Table 19

*Distribution of Teacher Survey Responses: Other Literacy Activities*

<table>
<thead>
<tr>
<th>OTHER LITERACY ACTIVITIES (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>I implemented Buddy Reading with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>I used the literacy-based Mystery Games with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>I implemented Graphics Practice with a high degree of fidelity.</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td><strong>Other Literacy Activities Section Summary</strong></td>
<td><strong>Total Possible Responses = 12</strong></td>
<td></td>
<td></td>
<td><strong>33%</strong></td>
<td><strong>67%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 19 reflects that 100% of teacher responses were in the agree (33%) or strongly agree (67%) categories. Deb remarked “the writing is the biggest part but there is also the part with the reading – because they have to read back their writing. The reading and writing are enmeshed. They have the buddy who is checking what they are doing…” (Personal communication, August 26, 2011). Reflecting on the graphics practice, Beth stated “I loved the graphics practice. I found it was a wonderful way to ease them into formal handwriting in a much more enjoyable way.” (Personal communication, September 27, 2011). These comments demonstrate the teachers’ experience with the aspects of this part of the curriculum they reported on the survey that they implemented with a high degree of fidelity.

Until this point in the survey, the questions addressed the extent to which the teachers recollected that they implemented the curriculum as it was designed. On virtually all of the curriculum components about which the survey asked, the teachers responded that they held themselves to a high degree of fidelity. Given that the teachers claim to have delivered the curriculum components as they were designed, the conclusion that can be drawn is that the
students would have had what Marzano (2003) calls the opportunity to learn (OTL) the early literacy skills the district deemed were important for kindergarten students.

**Part B: questions related to student achievement.** The Student Achievement section of the survey addressed questions that were not about curriculum components per se, but were about the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and the benefits of the curriculum that are not explicitly tested by the DIBELS. Table 20 shows the teacher response frequencies.

There were two areas within this section of the survey that generated divergent responses. The specific questions that asked the teachers to reflect on the extent to which the curriculum prepares the students well for the DIBELS Letter Naming Fluency (LNF) and Nonsense Word Fluency (NWF) indicators elicited one “disagree” response each.

The results show teachers had only minor variations in their responses when reflecting on the extent to which the Tools curriculum prepares students for the DIBELS indicators. For Initial Sound Fluency (ISF), the teachers were unanimous in their response of strongly agree (100%) that the curriculum prepares students well for this indicator. Beth underscored the group sentiment by explaining:

“...at the beginning of the year when students are starting to write in Tools, there is a huge emphasis put on the initial sound. They are actually encouraged to find the initial sound and write it – there is a huge emphasis.” (Personal communication, September 27, 2011)

The analysis of the curriculum supports the accuracy of the teachers’ comments.
### Table 20

**Distribution of Teacher Survey Responses: Student Achievement**

<table>
<thead>
<tr>
<th>STUDENT ACHIEVEMENT QUESTIONS (N=4)</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not Sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Choose Not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Tools of the Mind curriculum, as it was implemented in 2010-2011, resulted in students achieving the grade-level expectations that the school district has for kindergarten students.</td>
<td></td>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am aware of the test given as part of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was provided with each of my student's DIBELS results after each of the benchmark testing points (fall, winter, spring).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I used these DIBELS results to inform my instruction with individual students, as well as the whole class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum prepares students well for the DIBELS Initial Sound Fluency (ISF) subtest.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum prepares students well for the DIBELS Letter Naming Fluency (LNF) subtest.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum prepares students well for the DIBELS Phoneme Segmentation Fluency (PSF) subtest.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum prepares students well for the DIBELS Nonsense Word Fluency (NWF) subtest.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The self-regulation skills that are developed through this curriculum have made a difference in student social-emotional and academic growth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum allows for daily differentiation of student learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum builds early literacy learning in ways not tested by the DIBELS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum resulted in student learning in ways not realized by other kindergarten curricula in the district.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiencing the Tools of the Mind curriculum increased student engagement and enthusiasm for learning and school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Tools of the Mind curriculum has changed my personal disposition about teaching kindergarten</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Student Achievement Section Summary**

Total Possible Responses = 44

<table>
<thead>
<tr>
<th></th>
<th>5%</th>
<th>5%</th>
<th>23%</th>
<th>65%</th>
<th>2%</th>
</tr>
</thead>
</table>

---

**Notes:**
- The Tools of the Mind curriculum, as it was implemented in 2010-2011, resulted in students achieving the grade-level expectations that the school district has for kindergarten students.
- The self-regulation skills that are developed through this curriculum have made a difference in student social-emotional and academic growth.
- The Tools of the Mind curriculum allows for daily differentiation of student learning.
The Letter Naming Fluency (LNF) indicator question solicited one disagree (25%) response. The other three teachers responded that they agreed (25%) or strongly agreed (50%) that the curriculum prepared students well for this indicator. Teacher interview comments referenced that letter naming was integrated into play-based activities. Cindy highlighted that “there wasn’t (with the Tools curriculum) the explicit instruction that normally there would be (in a traditional core literacy program).” (Personal communication, September 15, 2011). In the Tools curriculum, the names of letters are learned through games, and as they are needed by children as they write.

The teacher responses to the question that asked if students were prepared well for the Phoneme Segmentation Fluency (PSF) indicator showed unanimous agreement that the curriculum prepares students well. Deb stated “this is what they are doing all day long; part of what they do with their writing; games, segmenting; in all activities; in January with centers – they are independently writing. It is not an isolated task. They are segmenting all day. It flows throughout their day.” (Personal communication, August 26, 2011). The curriculum is designed explicitly using phoneme segmentation as a precursor skill, which is foundational to further literacy learning.

Similarly to the responses for LNF, the responses for the Nonsense Word Fluency (NWF) indicator question solicited one disagree (25%) response. The other three teachers responded that they agreed (25%) or strongly agreed (50%) that the curriculum prepared students well for this indicator. The analysis of the curriculum revealed that the approach to teaching reading used a working-memory-conserving approach. This approach teaches children to look for word patterns versus sounding out every individual letter sound. Beth commented on how students respond to the task of decoding unknown words, “At the end of the year, when students are looking at
words to decode, they are looking and some of them actually said to me “where is the word pattern?” “I can’t see the word pattern in this?” (Personal communication, September 27, 2011). This comment reveals the mismatch between the way that reading is taught through the Tools curriculum and the design of the DIBELS Nonsense Word Fluency (NWF) indicator.

On the question that asked if the development of self-regulation skills had made a difference in student social-emotional and academic growth, teachers either agreed (25%) or strongly agreed (75%). Ann remarked “it is a much safer environment as kids are trying to regulate themselves, and if not regulating themselves, (they were) regulating others” (Personal communication, September 30, 2011). An increase in positive relationships was highlighted through Cindy’s remarks “they were a little bit more comfortable, and they would freely have a conversation with a student and not be quite as impulsive with their reaction to a situation.” (Personal communication, September 15, 2011). These comments reflect the impact of the Tools curriculum on the classroom community.

On the question of the curriculum allowing for daily differentiation of student learning, only one teacher (25%) responded not sure. All the others strongly agreed (75%). Ann’s explanation of this feature of the curriculum reflected the majority opinion:

It is constant differentiation with the scaffolding that is built right into the program. Kids are constantly learning from one another; they are learning at their own pace; they are not comparing themselves to anybody else in the classroom and you are able to hit them quickly and bump them to where they need to be if you need to push them a little bit harder in one area, you are able to do that and it doesn’t always necessarily have to be the whole group on one skill. (Personal communication, September 30, 2011)
Ann’s comments highlight the Vygotskian approach of using the child’s Zone of Proximal Development (ZPD) to structure the instructional support provided to students so that they can learn best.

**Finding #5:** District supports such as time for teachers to reflect and collaborate with colleagues, and time to make manipulatives necessary for teaching the Tools of the Mind curriculum, is needed

There were three statements on Part A of the teacher survey that generated “disagree” responses. Responses are displayed in Table 15. These statements had to do with district support evidenced by time for these teachers to discuss implementation with one another and/or create materials necessary for implementation. The majority sentiment was that it was very challenging to have a short window between the training and the implementation of the curriculum. As Cindy stated, “I felt that there wasn’t much time to process and reflect. It was “here it is and get going, you’ve got to do it tomorrow” (Personal communication, September 15, 2011). Beth qualified and contextualized this challenge by suggesting that these issues are faced in the implementation of any new curriculum. Eve, the director of early childhood acknowledged these challenges in her interview but suggested that learning how to implement the Tools curriculum is not something that could be isolated from immediate practice.

**Finding #6:** The Tools of the Mind curriculum implementation improved the teachers’ dispositions about teaching kindergarten.

The last question on the survey asked each teacher to reflect on whether or not implementing the Tools of the Mind curriculum had changed their personal disposition about teaching kindergarten. All four teachers responded affirmatively with this statement. Overall, teachers cited a reduction in professional stress, and a positive change in the learning environment. These
outcomes were attributed to the developmental appropriateness of the Tools curriculum. Ann remarked:

(laughs) Well, I can definitely say that I am less stressed throughout the day – I don’t feel like I am a hamster on a wheel anymore. It allows me to focus on individual kids instead of trying to teach up in front of the class. (Personal communication, September 30, 2011)

Increased pressure on kindergarten teachers and learners that has evolved over recent years was highlighted in Cindy’s comments:

I’ve talked many times with my colleagues, as the years [have passed], the push and the pressure of kindergarten and feeling like it was more of a 1st grade classroom so Tools did allow us to step back from a lot of the “must dos,” that we felt were more like what might be done in a typical grade one, and relax a little.

(Personal communication, September 15, 2011)

Cindy’s statement emphasized the positive difference in the Tools curriculum and the resulting learning environment compared to a traditional curricular approach.

Finally, Deb’s commentary emphasized the impact of teaching a curriculum aligned with her personal, developmentally-focused teaching philosophy. She stated, “I think I’m still the same person. But I think with Tools I am teaching more of what I believe versus what the government or someone else is telling me.” (Personal communication, August 26, 2011). Deb’s perspective reflects a visceral awareness of the governmental influence on local educational decisions.
**Research Question 3: Analyses of Student Results on the DIBELS**

The third research question was an exploration of how kindergarten students who experienced the Tools of the Mind curriculum perform on the DIBELS. This question was an investigation into the acquired, or the learned, curriculum. The statistical software used to conduct the analyses was a Windows, PC installation of SAS, version 9.1 (www.sas.com). Using this software, the three administrations were compared to one another to assess student performance growth. This information was presented in tabular and graphical formats to support analysis and discovery of student performance over time. The statistical analyses provided practical significance in relation to how the major stakeholders (teachers, early childhood director) understood and interpreted these data.

As a reminder, the DIBELS results were also used to inform the development of the follow-up, individual interviews with the teachers and the director of early childhood. When these interviews were conducted, data were captured about overall student learning as a result of experiencing Tools of the Mind. The teachers’ own words were used to qualify and explain the Tools curriculum connections to the DIBELS results and then to expand on their perspective of the early literacy learning that occurred as a result of using this curriculum.

**Student DIBELS results.** Student level data were collected from the three benchmark DIBELS tests administrations (fall, winter, spring). The data from the following indicators was analyzed: Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF). DIBELS score ranges with corresponding risk level for each testing period are displayed in Table 6.
Test results from the students who experienced the Tools curriculum were compared with the DIBELS national norms. This analysis was used to answer the third research question that was an exploration of the acquired, or learned, curriculum. Two major findings emerged.

**Finding #7:** Students who experienced the Tools of the Mind curriculum met grade level early literacy benchmarks that are highly predictive of future reading success.

The DIBELS data were analyzed, and the results displayed in tables. Following each table is a figure that graphically shows the growth over time for each group.

*Table 21*

**Initial Sound Fluency (ISF): Student DIBELS Performance**

<table>
<thead>
<tr>
<th>DIBELS Benchmark Score for Low Risk</th>
<th>Tools of the Mind Mean (SD)</th>
<th>N=</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF: Fall 8</td>
<td>34.21 (17.18)</td>
<td>47</td>
</tr>
<tr>
<td>ISF: Winter 25</td>
<td>45.57 (17.02)</td>
<td>48</td>
</tr>
</tbody>
</table>

The results in Table 21 show that the average (mean) student performance on the two ISF benchmark test periods was in the Low Risk category. The score that falls one standard deviation below the mean, remains in the Low Risk category for both testing periods. Figure 8 shows the growth of student performance over time.
The Tools growth across the year shows that the mean score is well above the minimum benchmark score for the Low Risk category. The same pattern is shown with the Letter Naming Fluency indicator results in Table 22.

Table 22

Letter Naming Fluency (LNF): Student DIBELS Performance

<table>
<thead>
<tr>
<th></th>
<th>DIBELS Benchmark Score for Low Risk</th>
<th>Tools of the Mind Mean (SD)</th>
<th>N=</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNF: Fall</td>
<td>8</td>
<td>30.51 (15.93)</td>
<td>47</td>
</tr>
<tr>
<td>LNF: Winter</td>
<td>27</td>
<td>48.87 (19.27)</td>
<td>48</td>
</tr>
<tr>
<td>LNF: Spring</td>
<td>40</td>
<td>59.77 (17.18)</td>
<td>48</td>
</tr>
</tbody>
</table>
The results in Table 22 show that the average (mean) student performance on the three LNF benchmark test periods was in the Low Risk category. The score that falls one standard deviation below the mean, in each of the testing periods, remains in the Low Risk category. Figure 9 shows the growth of student performance over time.

Figure 9. Letter Naming Fluency: Student DIBELS performance over time

The Tools growth across the year shows that the mean score is well above the minimum benchmark score for the Low Risk category. The same pattern is shown with the Phoneme Segmentation Fluency results in Table 23.

Table 23

Phoneme Segmentation Fluency: Student DIBELS Performance

<table>
<thead>
<tr>
<th>DIBELS Benchmark</th>
<th>Tools of the Mind</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score for Low Risk</td>
</tr>
<tr>
<td>PSF: Winter</td>
<td>18</td>
</tr>
<tr>
<td>PSF: Spring</td>
<td>35</td>
</tr>
</tbody>
</table>
The results in Table 23 show that the average (mean) student performance on the two PSF benchmark test periods was in the Low Risk category. The score that falls one standard deviation below the mean, for each testing period, remains in the Low Risk category. Figure 10 shows the growth of student performance over time.

![Graph showing growth of student performance over time](image)

**Figure 10.** Phoneme Segmentation Fluency: Student DIBELS performance over time

The Tools growth across the year shows that the mean score is well above the minimum benchmark score for the Low Risk category. The same pattern is reflected in the Nonsense Word Fluency indicator results in Table 24.

**Table 24**  
*Nonsense Word Fluency (NWF): Student DIBELS Performance*

<table>
<thead>
<tr>
<th></th>
<th>DIBELS Benchmark Score for Low Risk</th>
<th>Tools of the Mind Mean (SD)</th>
<th>N=</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWF: Winter</td>
<td>13</td>
<td>25.10 (13.27)</td>
<td>48</td>
</tr>
<tr>
<td>NWF: Spring</td>
<td>25</td>
<td>39.90 (16.04)</td>
<td>48</td>
</tr>
</tbody>
</table>
The results in Table 2 show that the average (mean) student performance on the two NWF benchmark test periods was in the Low Risk category. The score that falls one standard deviation below the mean, for the winter testing period falls one point into the Some Risk category. The score that falls one standard deviation below the mean in the spring falls two points into the Some Risk category. Figure 11 shows the growth of student performance over time.

![Figure 11. Nonsense Word Fluency (NWF): Student DIBELS performance over time](image)

The Tools growth across the year shows that the mean score is well above the minimum benchmark score for the Low Risk category.

**An explanation of benchmark goals and risk categories.** Growth in raw scores is important, but growth relative to standards and readiness for first grade with the foundational reading skills in place is the critical outcome. It is important to understand how these raw scores compare with DIBELS benchmark goals and risk categories. Kaminski and Good (2010) explain that the DIBELS benchmark goals are:
…empirically derived, criterion-referenced target scores that represent adequate reading progress. A benchmark goal indicates a level of skill where the student is likely to achieve the next DIBELS benchmark goal or reading outcome. Benchmark goals for DIBELS are based on research that examines the predictive validity of a score on a measure at a particular point in time, compared to later DIBELS measures and external outcome assessments. If a student achieves a benchmark goal, then the odds are in favor of that student achieving later reading outcomes if he/she receives research-based instruction from a core classroom curriculum (p.1).

A student whose score falls within the Low Risk category has an 80-90% chance of meeting subsequent benchmark goals of increasing difficulty.

**DIBELS benchmark goals.** Table 25 displays the spring 2011 results for all students who experienced the Tools of the Mind curriculum as percentages within risk categories.

<table>
<thead>
<tr>
<th>Risk Category (N=48)</th>
<th>ISF</th>
<th>LNF</th>
<th>PSF</th>
<th>NWF</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Risk</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Some Risk</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Low Risk</td>
<td>96%</td>
<td>96%</td>
<td>98%</td>
<td>88%</td>
</tr>
</tbody>
</table>

The data in Table 25 show that the vast majority of kindergarten students who experienced the Tools of the Mind curriculum were in the Low Risk category in all DIBELS indicators by the end of the year. This means that these students demonstrated grade level proficiency and have an
80-90% chance of meeting the beginning of first grade benchmark goals when they return in the fall.

**Finding #8:** The Tools of the Mind curriculum results in learning not captured by the DIBELS indicators.

All four teachers indicated that they observed learning outcomes that extended beyond the skills identified by the DIBELS. Specific details about these outcomes were discussed in individual interviews conducted with each of the teachers who implemented the Tools curriculum.

When asked to provide examples of the way(s) in which the Tools of the Mind curriculum builds early literacy in ways not tested by the DIBELS, the unanimous response focused on the students’ writing skills. Beth stated:

> All day long the children are exposed to writing whether it is in the mystery question, whether it is in their own writing “I am going to be…” and who they are going to be when they are dramatizing, whatever it is they are linking their verbal words to written words constantly. And usually, because it is their own writing and not just something they are reading, it has become more intrinsic – embedded in themselves. (Personal communication, September 27, 2011)

These comments highlight how the Tools curriculum approach emphasizes written speech as a tool for thinking. In addition, teachers cited reading comprehension as a curricular strength. Ann stated “We don’t test for retelling, but the kids’ story comprehension is amazing as well. By doing the Story Lab every day where kids are making connections with other stories, making connections with themselves” (Personal communication, September 30, 2011). She also
highlighted the effectiveness of the curriculum’s techniques that encourage the repetition of vocabulary integrated into conversations, make-believe play, and word games.

Cindy highlighted the Vygotskian approach to developing cognitive skills through the co-construction of their learning with peers. Teachers stated that the Tools of the Mind curriculum increased student engagement and student interest in learning and in school. Ann explained:

…the whole program is set up for keeping students engaged. They are talking to each other, sharing the news, for kiddos who would never have felt confident enough to raise their hand, to volunteer to offer information, this gives them the opportunity. They can turn to their partner and talk to them quietly and build those conversation skills. You are hearing from all of them all of the time rather than just choosing a couple here and a couple there. They are constantly engaged and they are constantly focused on the areas we are working on. (Personal communication, September 30, 2011)

These comments highlight the Vygotskian emphasis on social interaction as a requirement of learning. Moreover, they also demonstrate the power of student engagement on motivation to learn.

A phenomenon that all four teachers described was a reduction in the stressfulness of kindergarten learning. Deb’s commentary reflected the majority sentiment: “my kids had a stress free, developmentally-appropriate kindergarten year as opposed to the previous year that I felt was a shoved-down first grade.” She continued:

Kids coming out of Tools of the Mind are engaged learners that had a happy, stress-free kindergarten learning experience. I think they are confident, I think they are excited to read, to learn. I think they have all had a very positive experience. (Personal communication, August 28, 2011)
These comments reveal the contrast between the Vygotskian approach that is the foundation on which the Tools of the Mind curriculum is designed and the traditional curriculum that the teachers have been using.

The teachers also cited that the self-regulation components of the curriculum contributed to social emotional and academic learning by developing independence, strengthening working memory and building social connectedness. Ann stated “they take on the responsibilities for themselves. The fact that they can move independently from one activity to another without a ton of teacher direction…was a positive difference with the implementation of the Tools” (Personal communication, September 30, 2011). Cindy cited the children’s strong working memory as a significant component to their learning: “… (They had to) hold on to multi-directions…There was a lot that they were holding on to. That was a great improvement, a great plus” (Personal communication, September 15, 2011). These comments highlight the effectiveness of the curriculum in strengthening the children’s ability to remember deliberately what they need to remember to learn.

Finally, the social connectedness that emerged attributed to the self-regulation activities was an outcome highlighted in teacher interviews. Deb’s commentary reflected the majority sentiment:

I see that when the children were doing something to promote self-regulation, such as a finger play, children who might be more easily distracted or who might not have their full focused attention will not want to miss out on the social aspect so they will join the group. I also feel that it is something we do as a team, so it adds to the feeling of teamwork. In addition, a lot of the self-regulation pieces requires everyone helps so I think it gives them a better ability to work with
partners also and then of course their focusing is better so their academics are

going to improve. (Personal communication, September 27, 2011)

Additionally, all four of the teachers suggested that the Tools of the Mind curriculum created
learning in ways not realized with the district’s traditional curriculum. Ann stated:

I think the biggest thing that stands out for me is that they are really, truly learning for
themselves. They are taking the ball on everything. I am giving them the tools and they
run with it. They become invested. They are constantly engaged which is something that
with every other program I’ve used, you (teacher) are teaching them, and they are
learning for you. Rather I am giving them tools and they are learning for themselves.

(Personal communication, September 30, 2011)

Ann’s commentary highlights the student motivation for learning that has resulted with the Tools
curriculum. Deb supported this comment, referencing the student ownership of their learning
that she has seen develop around goal setting: “we talk about what they feel they should work on
and they are so on target; For example, “I really think I need to work on adding more words to
my sentence” or “I think I need to work on listening” – I mean they’ve got it!” (Personal
communication, August 28, 2011). Deb’s commentary reveals that students are invested in their
learning and have an understanding of where they need to improve.

Oceanside has a district writing assessment that is administered three times across the
school year. The majority of teachers commented on the positive change in student reaction to
this historically stressful event. The difference in the students who were experiencing the Tools
of the Mind curriculum compared with the traditional writing curriculum are reflected in Cindy’s
comments: “…the writing prompt …every Tools child sat down and said “Okay, you want me
to write? I’ll write what I can!” Whether they wrote lines, or initial sounds, or words, they felt
successful. (Personal communication, September 15, 2011) This commentary reveals an ancillary benefit of the Tools curriculum and the use of writing at as a central strategy for learning.

**Member checking.** Oceanside’s director of early childhood, as well as the teachers, were provided an opportunity to review the transcripts of the interviews conducted so as to validate the accuracy and to provide an opportunity for them to make changes and/or clarify any answers.

**Summary of Findings for All Three Research Questions**

The purpose of this qualitative research study was to investigate the process and outcomes of the Oceanside School District’s implementation of a Vygotskian, play-based kindergarten curriculum called the Tools of the Mind. The three research questions worked together to create a picture of what the intended curriculum was designed to do (Research Question #1); how fully the intended curriculum was implemented (Research Question #2) and how the enacted curriculum impacted student learning (Research Question #3). Four of the district’s ten kindergarten classrooms were involved in this implementation. To summarize, and to help the reader see the results within the bigger picture of this curriculum implementation, this researcher created a schematic of the logic model inputs and activities mapped to the findings for each research question. This schematic is identified as Figure 12.

**Triangulation of Data Sets**

After an analysis of the Tools of the Mind curriculum that was developed based on Vygotsky’s ideas about how young children learn, the teacher survey was designed. The survey was designed to highlight the comprehensiveness of the curriculum, and the components that should be part of daily learning. The DIBELS data, used for its practical and impressionistic
value, was then analyzed. Using the results from the teacher survey, and the DIBELS tests, interview questions were designed to triangulate the data that was generated by the teacher survey. Additionally, some questions were designed so that teachers could expand on answers provided in the teacher survey that would generate rich, detailed, description that could most easily be collected through conversation. Efforts were made during the interviews to probe further when answers were very general, or needed clarification so that the researcher could most accurately understand the meaning of, and behind, their words. Individual interviews were chosen as a means of gathering data from the teachers as a means of providing the most confidentiality with respect to teacher experience and assessment of this first year implementing a very different type of curriculum than the district had traditionally endorsed. The average years of teaching experience was almost 18, with no one teacher having fewer than 10 years. This information is important as a way of framing, and giving weight to, the information and commentary provided in the interviews.

The next and final chapter of this qualitative outcome evaluation will discuss the key findings for each of the research questions, make connections to the theoretical lens used, suggest implications for the research site, suggest scholarly significance and implications for further study.
Figure 12. Schematic of logic model summarizing research findings

Research Question #1 Findings (3):
1: The Tools of the Mind curriculum is explicitly designed to instruct students in all areas of early literacy skills critical to reading success.
2: The Tools of the Mind curriculum is designed based on developmental trajectories for early literacy skills and understandings categorized as precursors, fundamentals, and conventions.
3: The Tools of the Mind curriculum is viable given the time constraints of the school day.

Research Question #2 Findings (3):
4: The teachers reported that they implemented the curriculum with a high degree of fidelity to the way in which it was designed.
5: District support as evidence by time provided for teachers to reflect and collaborate with colleagues, and make manipulatives necessary for teaching the Tools of the Mind curriculum is needed.
6: The Tools of the Mind curriculum implementation improved the teachers’ dispositions about teaching kindergarten.

Research Question #3 Findings (2):
7: Students who experienced the Tools of the Mind curriculum met grade level early literacy benchmarks that indicate they will be highly likely to continue to experience reading success.
8: The Tools of the Mind curriculum results in learning not captured by the DIBELS indicators.
Chapter 5: Discussion of Research Findings

This qualitative study was an outcome evaluation of the implementation of the Vygotskyian, play-based Tools of the Mind curriculum in Oceanside School District, a predominantly white, non-low-income, coastal New England school district. The purpose of this study was to look at the student outcomes that resulted with the use of the Tools of the Mind curriculum, an alternative to that which is being used in many kindergarten classrooms today (Miller & Almon, 2009).

Three research questions were explored in this study:

1. How does the Tools of the Mind curriculum develop student literacy skills and understandings through play?

2. How does the teachers’ implementation of the Tools of the Mind curriculum reflect the curriculum as it was intended to be implemented? and

3. How do students who have experienced the Tools curriculum perform on the DIBELS?

Each of these research questions tap into information that Robert Marzano (2003) suggests creates the story of what happens in every school and classroom, regardless of location or socioeconomic demographic. How the intended curriculum, the curriculum the district selects to implement, gets enacted or implemented as a result of teacher decisions determines what gets attained or learned by students. In order to get an accurate assessment of the effectiveness of a curricular program, a district must investigate all three components. This study attempted to generate an accurate assessment of the effectiveness of the Tools of the Mind implementation by investigating these three components.
The results in support of these questions are discussed in the following chapter. In addition, limitations of the present study, educational implications of the study, and directions for future research are also identified.

**Discussion of Major Findings for Research Question #1**

The first research question investigated how the Tools of the Mind curriculum develops student literacy skills and understandings through play. The investigation involved examining the Tools of the Mind kindergarten curriculum manuals and other documentation written by the curriculum developers. This was a critical component to discover how each curriculum component and activity supports the Vygotskian approach to literacy learning, builds early literacy learning, and adequately addresses kindergarten literacy learning standards.

**Finding #1:** The Tools of the Mind curriculum is explicitly designed to instruct students in all areas of early literacy skills identified by the National Reading Panel (2000) as critical to reading success.

The findings revealed that the curriculum has a scope and sequence that would enable kindergarten students to acquire grade-level-appropriate skills and understandings, if implemented with fidelity. This Vygotskian-based curriculum uses dramatization, or intentional make-believe play based on themes launched from popular trade books. Furthermore, self-regulation skill development occurs during make-believe play and is embedded in all curriculum activities. This supports the Vygotskian belief that “the goal of early education is to build children’s self-regulation as they build content knowledge. This approach means that children’s ability to learn, as well as what they learn, is affected” (Leong, Bodrova, & Hensen, 2009a, p. 8).
Finding #2: The Tools of the Mind curriculum is designed based on developmental trajectories for early literacy skills and understandings categorized as precursors, fundamentals, and conventions.

Finding #3: The Tools of the Mind curriculum is viable given the constraints of the school day.

The Oceanside School District implemented the Tools of the Mind curriculum in four of the 10 total classrooms that serve the kindergarten students. The “skills, concepts, and abilities developed in the Tools curriculum are the same as the outcomes called for by the National Reading Panel and in books such as Preventing Reading Difficulties. But the path taken in Tools to achieve those outcomes is a very different one” (Leong et al., 2009a, p. 75). Moreover, this comprehensive curriculum can be delivered, and is therefore viable, in the regular kindergarten school day.

For any curriculum to be implemented with fidelity and for that fidelity to be maintained over time, it must be viable. Teachers must be able to deliver the curriculum as it was designed within the time available within the school day. If the curriculum is not viable, teachers will begin to make decisions about what they do not have time to teach. With these decisions comes the breakdown of the fidelity to the intended curriculum. As this occurs, the very reasons that a curriculum was chosen can be undermined.

The Tools of the Mind curriculum is a comprehensive curriculum that is carefully constructed to link the learning in a way that makes sense for children. It is not a curriculum that can be delivered in an a la carte format, where teachers pick and choose among the lessons, or the techniques, and elements of the play-based activities. Because of the interconnectedness of the learning, if one component is omitted, it will impinge on the larger learning whole.
Research site implications: Given that the research has demonstrated that the necessary early literacy foundation are explicitly taught in this alternative, play-based curriculum, the district will need to decide if the remaining classrooms will adopt Tools of the Mind. Consideration may focus on what stakeholders say are the benefits to this curriculum that are not realized through the use of the current traditional program used in kindergarten.

Scholarly significance and issues for further study. The previous literature suggested that in identifying ideal practices for early childhood classrooms, that there must be interdisciplinary research that brings together a developmentally informed view of children and educational goals of schools, as the connection between the child and classroom environment is so dynamic (Rimm-Kaufmann, et al.; Huston-Stein, et al.). Moreover, in the literature that examined self-regulation as it related in some way to the classroom, it was suggested that there remains the need to look more deeply at the role of behavioral self-regulation in kindergarten and explore it in relation to academic achievement, especially in math (Matthew, et al.; Ponitz, et al.; Huston-Stein, et al.). The Tools of the Mind curriculum incorporates both of these components of early learning. Because the Tools of the Mind curriculum is a relatively new curriculum (still considered to be in development), it would be helpful if a large-scale research study could be undertaken to learn more about the academic achievement of those students who experience this curriculum.

Discussion of Major Findings for Research Question #2

The second research question was an investigation into how the teachers’ implementation of the Tools of the Mind curriculum reflected the curriculum design. The investigation into this question involved anonymously surveying teachers about what they remember about the extent
to which they implemented the curriculum with fidelity. The survey responses were used alongside the results of the student DIBELS results to craft questions that were asked in individual follow up interviews to generate data about the teachers’ experiences, impressions, beliefs and perspectives on the first year of the Tools of the Mind curriculum implementation.

Finding #4: The teachers reported that they implemented the curriculum with a high degree of fidelity to the way in which it was designed.

Finding #5: District support as evidenced by time provided for teachers to reflect and collaborate with colleagues, and make manipulatives necessary for teaching the Tools of the Mind curriculum is needed.

Finding #6: The Tools of the Mind curriculum implementation improved the teachers’ dispositions about teaching kindergarten.

The results suggest the importance of considering teachers’ motivation to implement curriculum with fidelity. All four of the participating district’s teachers responded that the Tools of the Mind curriculum matched her personal philosophy of early childhood education. This factor would seem likely to have an impact on that particular teacher’s motivation to implement the curriculum with fidelity if not with enthusiasm (Davidson, et al.; Castro, et al.; Lieber, et al.; and Vartuli & Rohs). Because the student DIBELS results were not differentiated by classroom, there was no way to analyze student results by the particular classroom teacher who provided his or her classroom instruction. Davidson et al.’s research results found that teachers were low or poor implementers, categorized as being resistant to implementing key components of the curriculum, because “these components went against their teaching philosophy” (Davidson et al., p. 199). The fact that the Tools curriculum validated the teachers’ personal philosophy would suggest that these teachers would be high implementers (Davidson et al.) Moreover, teachers
reported that their dispositions about teaching kindergarten had improved. This suggests that these teachers were happier and reported less on-the-job stress with this curriculum that was aligned to their personal and professional beliefs about the teaching and learning environment that they want for their kindergarten classrooms.

**The role of professional development in curriculum implementation with fidelity.**

The Tools of the Mind teacher professional development package that is contractually required by the Tools curriculum developers leverages lessons suggested by Lieber et al. Lieber et al.’s research suggests that there is “limited research evidence… identifying professional development interventions that are effective in changing early childhood teachers’ instructional practices” (p. 457). Adequate training and support for teachers are especially important given recent evidence that teacher’s instruction and supportive interactional style are important factors that promote children’s active involvement in learning (Lieber et al., p. 459). In the literature reviewed, there were multiple full-day training sessions that oriented the teachers to the use of a specific curriculum and instructional approach (Davidson, et al.; Castro, et al.; Lieber, et al.). Additionally, in two of the studies an implementation coach was used. This coach worked directly with the teachers through a series of classroom visits and dialogue with teachers (Davidson et al., Lieber, et al.). Interestingly, Lieber et al., and Davidson et al., in separate studies both found that professional development alone did not result in teachers’ implementing the respective curriculum with fidelity.

The Tools of the Mind professional development package for the first year of implementation consists of four full days of training across the school year, the support of a district-based implementation coach to support the fidelity with which teachers enact Tools curriculum lessons and activities, and four technical assistance visits by the Tools of the Mind
curriculum trainer. These technical assistance visits are designed to calibrate the coach’s and teachers’ interpretation and understanding of curriculum components in an effort to support an accurate and effective implementation.

These aspects of the Tools curriculum package convey an appreciation by the Tools curriculum designers that adequate training and support for teachers are especially important given that effective pedagogy is complex and challenging (Ginsburg et al., 2006, Maxwell, Field, & Clifford, 2006), as are interventions (such as the coach and Tools curriculum trainer’s technical assistance visits) designed to affect both teachers’ instruction and children’s learning (Lieber et al.).

**Implications for the research site:** It appears from teacher response that the Tools of the Mind curriculum is one that they have embraced. However, the measure of fidelity of curriculum implementation was done via teacher self-report and reflecting on the school year after it had ended. If Oceanside School District goes forward with adopting this curriculum in the other six kindergarten classrooms, it might consider doing systematic classroom observations. The purpose of the observations would be to document formally the level of the fidelity of implementation and to validate that the classroom and instructional practices are aligned with the curriculum as it was designed. The Oceanside School District might consider creating fidelity checklists, and using these as part of the teacher evaluation process, as anchors for the curriculum components and to maintain consistency across classroom practice.

Oceanside School District might also want to consider their non-Tools curriculum teaching staff members’ dispositions about teaching the traditional kindergarten curriculum in light of the information that the teachers who implemented the Tools curriculum had to say. The differences in the Tools-curriculum teachers experiences contrasted with the traditional
curriculum seem to be considerable. This is a factor that Oceanside School District might want to investigate for the long term satisfaction of their kindergarten teaching staff.

**Scholarly significance and issues for further study.** The results of this present study support research efforts to measure the degree to which teachers have the ability to implement curriculum with fidelity (Davidson, Fields, and Yang, 2009; Castro, Brown, Pitvorec, and Ditto, 2007; Lieber, Butera, Hanson, Palmer, Horn, Czaja, Diamond, Goodman-Jansen, Daniels, Gupta, and Odom, 2009; and Vartuli & Rohs). The results of this research study contribute to the literature by providing another example of a study that addresses the fidelity of curriculum implementation in early childhood and underscores the importance of Vartuli and Rohs’ (2009) research. Vartuli and Rohs insist on fidelity assurances without which “one can only assume that the curriculum was adhered to and delivered with the same consistency and precision in every classroom” (p. 506).

**Discussion of Major Findings for Research Question #3**

Research question #3 was an investigation of how students who experienced the Tools of the Mind curriculum performed on the Dynamic Indicators of Early Literacy Skills (DIBELS). The investigation involved examining the Oceanside School District’s kindergarten DIBELS results for the students in the Tools-based classrooms. A student’s DIBELS results are assigned a level of risk (Low Risk, Some Risk, At Risk) that is used to predict that student’s future reading success. A student score in the Low Risk category means that the student is meeting grade level reading expectations.
Finding #7: Students who experienced the Tools of the Mind curriculum met grade level early literacy benchmarks that indicate that they will be highly likely to continue to experience reading success.

The 2010-2011 results showed that greater than the vast majority of students who experienced the Tools curriculum met benchmark goals for all four DIBELS indicators. Table 24 contains a summary of these results.

Finding #8: The Tools of the Mind curriculum results in learning not captured by the DIBELS indicators.

As Marzano suggested, the attained curriculum is the content actually learned by students (Marzano, 2003, p. 23). In order to access what the students have learned there must be assessment. Marzano cites research by George Madaus and his colleagues that found that “tests that are not specifically designed to assess a particular school’s curriculum frequently underestimate the true learning of students” (Madaus, Kellaghan, Rakow, & King, 1979; Madaus, Airasian, & Kellaghan, 1980; cited by Marzano, 2003, p. 38). Marzano further emphasizes that “unless a school employs assessments that are specific to the curriculum actually taught, it cannot accurately determine how well its students are learning” as a result of the intended and implemented curriculum (p. 38). All the teachers responded that they either agreed or strongly agreed when asked if the Tools of the Mind curriculum builds early literacy learning in ways not tested by the DIBELS. Table 19 shows these results.

Using the DIBELS indicators as the primary tool for gauging student literacy learning neglects to account for other important learning that has occurred as a result of experiencing this curriculum. The teachers cited academic learning such as the development of writing skills, reading comprehension, vocabulary development, and oral language development as areas of
significant growth. Additionally, the teachers highlighted a dramatic increase in student motivation and engagement, and a reduction in the stress of kindergarten because of the developmental-appropriateness of the curriculum. These benefits were described as successes and were contrasted with the traditional curricula they have used previously.

**Implications for the research site.** The decision to adopt this play-based curriculum, first implemented in fall 2011, was motivated by an interest to return to a more developmentally-appropriate and engaging kindergarten learning experience (personal communication, 2011). Additionally, there was an opportunity for the district to participate in a larger research study evaluating the efficacy of the Tools of the Mind curriculum that was being conducted by a major northeast coast university that would provide the district with cost-free curriculum, training, and materials. These complimentary interests were the foundation for the district’s move to implement this alternative curriculum.

The results of this study suggest that students who were immersed in the play-based Tools of the Mind curriculum demonstrate grade-level benchmark skills on DIBELS. This suggests that a kindergarten curriculum does not have to exclude play-based learning in order for students to achieve grade level academic goals. Moreover, the teachers described other compelling evidence that potentially has a significant impact on academic learning, such as student motivation and engagement and a reduction in the stressfulness of the learning environment. Not only did the teachers report a reduction in student stress, but also they reported a reduction in their own stress, despite the fact that it was the first year of implementation. The reduction in teacher stress may be a result of the match between the Tools of the Mind philosophy and their own personal and professional philosophies about kindergarten teaching and learning. This phenomenon is discussed more fully under Finding #6.
As a shorter-term decision, the district will need to weigh the outcomes that are described in this report against the costs associated with initiating Tools of the Mind in the remaining six kindergarten classrooms. This deliberation will be important and might include other factors such as the necessity (or lack thereof) to have a consistent kindergarten curriculum across all the Oceanside School District’s elementary schools, potential unrest among teachers, and perhaps parents, if there is a difference in what kindergarten learning looks like across the district. Moreover, if a perception or belief exists across the district kindergarten staff that the Tools of the Mind approach is better and more developmentally appropriate in the eyes of stakeholders, there will need to be a plan in place to address the negative reactions and emotions if the Tools of the Mind curriculum is not extended to the other schools.

**Scholarly significance and issues for further study:** To assess a curriculum that goes against the current tide of skills-driven, teacher-directed approaches, it is critical to consider the type of assessment that will adequately reflect the learning to which the children have been exposed. The DIBELS is being used in many districts across the country. The DIBELS indicators are a powerful suite of assessments for gauging future reading success. However, these tests do not tell the whole literacy story with any child. The DIBELS data must be used much like a thermometer is used as an indicator of a child’s overall health. Additional literacy data must be used in concert with the DIBELS data when determining a student’s true literacy skills and understandings.

When additional literacy data are used in conjunction with DIBELS, teachers can triangulate the DIBELS results. When multiple sources of individual student performance data are used holistically, better instructional decisions can be made to meet the student’s learning needs. Literacy data that could be collected and used in addition to the DIBELS, might come
from classroom-generated work samples, the student writing that is an essential driver for
learning in the Tools curriculum, informal and formative assessments, teacher observation of
students performing literacy tasks, and even talking to students about what they perceive to be
their reading strengths and challenges. All these data sources provide a more complete profile of
each learner and how he or she is evolving as a reader and a writer.

Most adults remember kindergarten as a time of play and transition from home to school.
But in kindergarten today, teachers are using pedagogical approaches that emphasize academic
skills at the exclusion of play-based learning. This environment has evolved in an era of
educational accountability with the federal NCLBA as a backdrop. The research has
documented that academics have replaced child-centered, experiential, inquiry-based learning
activities in urban and suburban schools (Miller & Almon). The results of this study suggest that
academic achievement is not incompatible with a developmentally-appropriate, play-based
kindergarten learning environment if the curriculum is designed strategically.

Why is it so important to understand how kindergarten students learn best and identify
the components of an optimal learning environment? It is important because kindergarten is the
foundational experience for future learning, and the methodology used to teach children at this
grade level sets the stage for learning and student behavior in later grades. As a result, it is
important to try and determine if a kindergarten classroom that is student-centered, focused on
play, and develops social-emotional skills is incompatible with the goal of children meeting this
grade level’s learning expectations. Moreover, student engagement and motivation are critical to
sustained, and self-directed learning. Engagement in kindergarten sets a disposition for learning
that could potentially have far-reaching effects.
Limitations

There were limitations that are presented in this research study. First, this research study was based on the first year of implementation of a curriculum. There are always difficulties in implementing a new curriculum. Michael Fullan (2001) calls this an implementation dip. Fullan suggests that no matter how much pre-implementation preparation, the first six months or so of implementation will be bumpy. Because of the complexity of change, and the learning that needs to take place on the part of teachers in order to implement the curriculum effectively, judging the effectiveness of curriculum after the first year will not be indicative of its true impact. Second, the fidelity of curriculum implementation was based on the recollection of teachers’ self-reporting. The district had no formal procedure in place to collect data on the fidelity of curriculum implementation during the 2010-2011 year. Relying on human memory has inherent risks, as does any self-reporting. Finally, the student-level data analyzed during this research study had only practical, impressionistic importance but not statistical significance. However, these results do provide qualitative data about the efficacy of the Tools of the Mind, play-based curriculum and kindergarten student learning.

Conclusion

Providing kindergarten students the educational foundation necessary to enable them to be academically successful in later years is a goal that few, if any, would not embrace. Closing achievement gaps of children who are low income and/or from minority backgrounds, is essential. Given this era of reform and accountability, it seems that practical educational policy and decision making are being driven by political, economic, and cultural concerns (Miller & Almon, 2009). This research study of a play-based curriculum, its implementation, and the
resultant student achievement outcomes provides a window into an alternative kindergarten environment to the one that is typical of today’s elementary schools. The results showed that the vast majority of students who experienced the Vygotskian, play-based curriculum met kindergarten learning expectations evidenced by the DIBELS Low Risk scores. Moreover, the student writing skill development, the level of student engagement, the reduction of stress associated with learning, and the self-regulation development that resulted from using the curriculum were additional benefits that had not been anticipated by teachers.

How do the results of this outcome evaluation challenge the thinking behind the evolution of kindergarten classrooms as places that emphasize academic skills at the exclusion of play-based learning? Since the time of Friedrich Froebel, the German educator considered the father of kindergarten, play has been at the heart of early childhood learning. Froebel’s vision for kindergarten was to stimulate an appreciation and love for children and to provide an educational environment customized to their needs:

…the great aim and the end of the whole enterprise is the education of a person from the earliest years through his own doing, feeling, and thinking and in conformity with his own nature and relationships so that his life is an integrated whole. This will be achieved if the child’s activity is rightly fostered and his essential nature developed and experienced. In such a comprehensive enterprise, there is no room for anything which disturbs or might destroy such purposes. (Lilley, 1967, p. 118-119)

The Tools of the Mind curriculum, carefully constructed based on Vygotsky’s theory of the centrality of play in early childhood education, supports the vision of Froebel. Educational policy makers, public school leaders, and classroom teachers can look to this study’s results as another example of a way to alter their kindergarten learning environments if they so choose.
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## Appendix A: National Reading Panel Key Components

*Key Components to Early Literacy Learning Reported by the National Reading Panel (2000)*

<table>
<thead>
<tr>
<th>Literacy Topic</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alphabets:</td>
<td></td>
</tr>
<tr>
<td>Phonemic Awareness (PA)</td>
<td>Teaching phonemic awareness to children significantly improves their reading more than instruction that lacks any attention to PA. (Report of National Reading Panel, p. 7)</td>
</tr>
<tr>
<td></td>
<td>PA training was the cause of improvement in students’ phonemic awareness, reading, and spelling following training.</td>
</tr>
<tr>
<td>Alphabets:</td>
<td></td>
</tr>
<tr>
<td>Phonics</td>
<td>Systematic phonics instruction produces significant benefits for students in kindergarten through 6th grade and for children having difficulty learning to read. The ability to read and spell words was enhanced in kindergartners who received systematic beginning phonics instruction.</td>
</tr>
<tr>
<td>Fluency</td>
<td>“Guided repeated oral reading procedures that included guidance from teachers, peers, and parents had a significant and positive impact on word recognition, fluency, and comprehension across a range of grade levels” (p. 12)</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>Vocabulary instruction does lead to gains in comprehension, but methods must be appropriate to the age and ability of the reader. Vocabulary also can be learned incidentally in the context of storybook reading or in listening to others. Learning words before reading a text also is helpful. Techniques such as task restructuring and repeated exposure (including having the student encounter words in various contexts) appear to enhance vocabulary development. (p.14)</td>
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<tr>
<td>Text Comprehension</td>
<td>Evidence suggests that teaching a combination of reading comprehension techniques is the most effective. When students use them appropriately, they assist in recall, question answering, question generation, and summarization of texts. When used in combination, these techniques can improve results in standardized comprehension tests. (p. 15)</td>
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Appendix B: Teacher Survey Questions

Anonymous Teacher Survey for Tools of the Mind Implementation
(Administered electronically via the Internet)

Dear Teacher:

These questions relate to the “fidelity” with which you implemented the Tools of the Mind curriculum during the 2010-2011 school year. The term “fidelity” means that you consistently implemented the lessons as they were designed and did not make changes to them that would alter either the self-regulation learning or the literacy concept and/or skill development. This implies that there was adequate preparation, pre-reading of lesson material prior to conducting a lesson or learning activity, and adequate time for the lesson to be conducted as it was intended by the curriculum designers. I appreciate your candid answers to these questions.

The Likert Scale is as follows: 1=strongly disagree; 2=disagree; 3=not sure; 4= agree; 5=strongly agree; 6=choose not to answer

Part A: Curriculum Implementation Questions
1. The district provided professional development/training sessions that were helpful to understanding how to teach the curriculum
2. The district provided a curriculum coach that provided explicit feedback to help implement the curriculum activities with fidelity
3. The district provided me with time to discuss and collaborate with colleagues on curriculum implementation issues
4. The district provided me with time to make the manipulatives, or items necessary to implement lessons with fidelity
5. The district provide me with all the materials that I needed to implement the curriculum with fidelity
6. This curriculum aligns with my personal philosophy of early childhood learning.
7. Overall, I held myself to a high degree of curriculum implementation fidelity with all the curriculum components

Self-Regulation Activities
8. I implemented the Attention Focusing Activities with a high degree of fidelity
9. I implemented the Community Building Activities with a high degree of fidelity
10. I implemented the Physical Self-Regulation Activities with a high degree of fidelity
11. I had classroom rules posted, and used them with my students explicitly as the curriculum suggested.
12. My students engaged in Share the News with the frequency and duration that the curriculum recommended.
Literacy Activities
13. I implemented the Literacy Block with fidelity for 90 minutes a day across the school year.
14. I implemented Story Lab, Scaffolded Writing, and Center Activities with the frequency and duration that the curriculum recommended.
15. During Story Lab time, I was able to teach all the reading comprehension strategies the program expected and practice these strategies on an ongoing basis.
16. I used the dramatization component of the Story Lab on a regular basis as the curriculum was designed.
17. I used Scaffolded Writing to build sound-to-symbol correspondence.
18. I provided tools like the Sound Map and the Vowel Map to students in a manner that was consistent with curriculum recommendations.
19. I used dramatization activities for approximately 20 minutes a day.
20. I arranged mixed ability groups of 4-6 students and/or conducted literacy games with the whole group to practice visual and auditory memory for 10-15 minutes a day.
21. I conducted literacy-oriented learning center activities for 60-70 minutes daily.
22. I led small-group, differentiated instructional interactions at least 4 days a week to target literacy concept and skill development.

Scaffolded Writing Activities
23. I implemented Message of the Day with a high degree of fidelity.
24. I implemented Elkonin Boxes I-IV with a high degree of fidelity.
25. I implemented Center Planning writing with a high degree of fidelity.
26. I used the dynamic assessment box to document the student’s independent level of writing development and the student’s level of writing development when assisted, with a high degree of fidelity.
27. I conducted the Read-Write-Learn activities (Storyboards, Chapter Summaries, and Write About) with a high degree of fidelity.
28. I used the Write Along of Silly Sentences, Tongue Twisters, Riddles and Jokes with fidelity.

Other Literacy Activities
29. I implemented Buddy Reading with a high degree of fidelity.
30. I used the literacy-based Mystery Games with a high degree of fidelity.
31. I implemented Graphics Practice with a high degree of fidelity.

Part B: Questions Related to the Curriculum and Its Impact on Student Learning
These questions assume that teachers have seen and are familiar with each of the DIBELS tests used in kindergarten.
32. The Tools of the Mind curriculum, as it was implemented in 2010-2011, results in students achieving the grade-level expectations that the school district has for kindergarten students.
33. I am aware of the tests given as part of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).
34. I was provided with all of my students’ results after each of the benchmark testing points (fall, winter, spring)
35. I used these results to inform my instruction with individual students, as well as the whole class.
36. The Tools of the Mind curriculum prepares students well for the Initial Sound Fluency (ISF) subtest.
37. The Tools of the Mind curriculum prepares students well for the Letter Naming Fluency (LNF) subtest.
38. The Tools of the Mind curriculum prepares students well for the Phoneme Segmentation Fluency (PSF) subtest.
39. The Tools of the Mind curriculum prepares students well for the Nonsense Word Fluency (NWF) subtest.
40. The self-regulation skills that are developed through this curriculum have made a difference in student social-emotional and academic growth.
41. The Tools of the Mind curriculum allows for daily differentiation of student learning.
42. The Tools of the Mind curriculum builds early literacy learning in ways not tested by the DIBELS.
43. The Tools of the Mind curriculum resulted in student learning in ways not realized by other kindergarten curricula used in the district.
44. Experiencing the Tools of the Mind curriculum increased student engagement and enthusiasm for school.
45. The Tools of the Mind changed my personal disposition about teaching kindergarten.
Appendix C: Interview Questions

Questions for follow up interviews with teachers:

1. What was successful in the implementation of Tools of the Mind?

2. What was challenging in the implementation of Tools of the Mind?

3. Here are the DIBELS results for the Initial Sound Fluency (ISF)__________. What is your reaction?

4. Here are the DIBELS results for the Letter Naming Fluency (LNF) _________. What is your reaction?

5. Here are the DIBELS results for the Phoneme Segmentation Fluency (PSF) _________. What is your reaction?

6. Here are the DIBELS results for the Nonsense Word Fluency (NWF) _________. What is your reaction?

7. Can you provide examples of the way(s) in which the Tools of the Mind curriculum builds early literacy in ways not tested by the DIBELS?

8. In your opinion, is the DIBELS a valid measure for assessing literacy skills learned by students experiencing Tools of the Mind?

9. Can you provide examples of how the self-regulation skills that are developed through this curriculum have made a difference in student social-emotional and academic growth?

10. Can you provide examples of way in which the Tools of the Mind curriculum allows for daily differentiation of student learning?

11. Can you provide examples of the way(s) in which the Tools of the Mind curriculum resulted in student learning in ways not realized by other kindergarten curricula used in the district?

12. Can you provide examples of the way(s) in which the Tools of the Mind curriculum increased student engagement and enthusiasm for learning and school?

13. Can you explain how the Tools of the Mind curriculum has changed your personal disposition about teaching and learning?

14. What is your overall assessment of Tools of the Mind?

15. Any additional questions related to the topic.
Interview Questions for the Early Childhood Director

1. What are your impressions of the Year 1 of the Tools of the Mind implementation?
2. What were the successes?
3. What were the challenges?
4. What was your impression of the DIBELS results of the Tools of the Mind classrooms compared with the non-Tools of the Mind classrooms?
5. Is the DIBELS capturing the data that provides an accurate reflection of the literacy skills of the Tools of the Mind students?
6. Characterize the kindergarten teachers impressions of the curriculum and its effectiveness
7. How did parents react to the curriculum?
8. Describe any unanticipated issues that resulted from the implementation
9. Overall, what is your assessment of the Tools of the Mind curriculum compared to the other literacy program being implemented in the other kindergarten classrooms.
10. Is the district realizing the benefits and meeting the goals it set when deciding to implement the Tools of the Mind curriculum? Will it be extended to the other kindergarten classrooms?
Appendix D: How Dramatization Support Literacy Development

The Tools of the Mind curriculum uses The Magic Treehouse book series by Mary Pope Osbourne as a vehicle for learning literacy content. This book series might be more typically used in second grade as a beginning chapter book texts. However, the Tools curriculum uses the series to support make-believe play and learning academic content in literacy, math and science. The expectation is that the classroom should be “decorated to transport children to this creative magic place” (Leong et al., 2008, p. 64) featured in the particular book. This allows children feel the connection with the make-believe world of the story and for the main characters of Jack and Annie (Leong et al., 2010b, p. 33).

After engaging in Story Lab, wherein the teacher has read chapters from the book, discussed major story elements, vocabulary, and checked for general comprehension, the students prepare for Dramatization. In Literacy Center activities that precede the dramatic play, children deepen their understanding of the story and facts learned through, for example, drawing and writing a storyboard of the action that occurred. The children might also draw or write his or her personal response to the comprehension question discussed in the larger group. Then, each child is given a role card to help him or her remember the character they will be playing during the first of two rehearsals of the selected scenes. The role cards also serve as mediators for the other children to help the children support one another in remembering what happens next, or what a particular character should or should not say (self-regulation and other-regulation). A ritual is determined through which the students enter their imaginary world. The Tools curriculum suggests that the children might put on a pretend backpack and twirl around in front of the dramatization center’s tree house several times (Leong et al., 2010b, pp. 30-31).
The children then play the story scene that they have discussed in the larger group. They also come up with a prediction of what might happen next, just after the point at which they have heard the teacher read to the class. They make props that they think they will need. Many props have new vocabulary connected to them. In the Tools curriculum, children learn basic vocabulary through what is termed *indirect vocabulary instruction*.

Teachers learn techniques to encourage the repetition of this new vocabulary in the children’s exchanges with each other—during conversations, dramatization, Center Planning interactions, drawing/writing—as well as with the teacher. Centers are set up so that vocabulary use will be enhanced. For example, when children make up a prop, they have to use words to label it or no one else will know what it is. This is why children say “Let’s pretend we’re in the Amazon and there are pythons” when they are using a towel around their neck, but when the toy is a replica of a snake they don’t have to label it. By setting up the center with objects children can *pretend* are props, rather than stocking it with real objects, teachers are actually promoting vocabulary use. (Leong, et al., 2008, p. 80)

The dramatization helps young children become actively immersed and engaged with the story in a deep way. Acting the story out helps build listening comprehension by strengthening the child’s understanding of the story.

“This acting out (dramatization) is to listening comprehension as manipulatives are to mathematics concepts. Dramatization has been shown to increase recall and understanding of the more subtle aspects of a story. When children act out the story, they express their own understanding of the storyline, the characters, the social relationships
between the characters, their feelings, and the events that unfold.” (Leong et al., 2008, p. 82)

The Magic Tree House books increases the challenge for children, because the vocabulary as well as the story events demand a higher level of listening comprehension skill. Children have to remember more complex story lines and more characters as the story develops and changes. Additionally, the Magic Tree House books as chapter books provide an authentic vehicle through which to make predictions and inferences about the story, characters, and the plot. This evolution in the children’s comprehension skills and understanding is engaged through dramatization. The dramatization allows children to act out the visualization, the inferences and the resulting effects of the story as they imagine it to be. Visualization is a skill that is explicitly used in the Tools curriculum because of its connection to the development of reading fluency (Leong et al., 2008, p. 82).
Appendix E: Teacher Survey Recruitment Material

Text of Unsigned Consent Document for Web-Based Online Survey (modified from Template 4)

Northeastern University: College of Professional Studies  
Name of Investigators: Margaret Dougherty, EdD, and Moira S. Rodgers, student researcher  
Title of Project: Structured Play and Student Learning in Kindergarten: An Outcome Evaluation

Request to Participate in Research

Dear Teacher:

My name is Moira S. Rodgers, and I am a doctoral student researcher from Northeastern University. Dr. Maggie Mack provided me with your email address so that I could invite you to participate in an anonymous, web-based online survey. This survey is part of a research study that focuses on the impact of structured play on kindergarten student learning. The survey should take about 15 minutes to complete.

I am asking you to participate in this study because you were a kindergarten teacher who implemented the Tools of the Mind curriculum with your class this past school year (2010-2011).

The decision to participate in this research project is voluntary. You do not have to participate and you can refuse to answer any question. Even if you begin the web-based online survey, you can stop at any time. Your decision to participate or not participate will have no effect on your standing in your school and/or district.

Should you volunteer to participate in the web-based online survey, I will be inviting you to participate in a follow up interview session conducted as either a one-hour focus group or 30 minutes telephone interview to ask you about your impressions of this study’s results.

There are no foreseeable risks or discomforts to you for taking part in this study.

There are no direct benefits to you from participating in this study. However, your responses may help us learn more about how the Tools of the Mind curriculum impacts student learning as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

You will not be paid for your participation in this study. However, if you were to be interested in the final report that I generate, I would be happy to provide you a copy. Simply email me at the web address below and I will be sure that you get this document, once completed.

Your part in this study is anonymous to me as the researcher. However, because of the nature of web based surveys, it is possible that respondents could be identified by the IP address or other electronic record associated with the response. Neither I, as the researcher, nor anyone involved with this survey will be capturing those data. Any reports or publications based on this research will use only group data and will not identify you or any individual as being affiliated with this project.

If you have any questions regarding electronic privacy, please feel free to contact Mark Nardone, IT Security Analyst via phone at 617.373.7901, or via email at privacy@neu.edu.

If you have any questions about this study, please feel free to contact me, Moira S. Rodgers, at 508.237.9322, or via email at smithrodgers@hotmail.com, as I am the person mainly responsible for the research. You can also contact Margaret Dougherty, the Principal Investigator, via email at m.dougherty@neu.edu.

APPROVED
NU IRB# 10-11-42
VALID 6/13/11
THROUGH 1/11/14
If you have any questions regarding your rights as a research participant, please contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.7570, Email: irb@neu.edu. You may call anonymously if you wish.

By clicking on the survey link below you are indicating that you consent to participate in this study. Please print out a copy of this consent form for your records.

Survey Link: http://teacher.limeask.com/83144/lang-en

Thank you for your time.
Moira S. Rodgers

Text of Unsigned Consent Document for Web-Based Online Survey (modified from Template 4)
Appendix F: Interview Recruitment Material

Northeastern University: College of Professional Studies
Name of Investigators: Margaret Dougherty, EdD, and Moira S. Rodgers, student researcher
Title of Study: Structured Play and Student Learning in Kindergarten: An Outcome Evaluation

Request to Participate in Research: Follow Up Interview

Dear Teacher:

As a result of your June 2011 participation in the anonymous, on-line survey about the fidelity of your implementation of the Tools of the Mind curriculum during the 2010-2011 school year, I am inviting you to participate in a follow-up interview.

This interview will take place during the week of August 24th and will take about 30 to 45 minutes. If you decide to take part in this study, we will ask you answer a series of questions and provide your opinions about the 2010-2011 Tools of the Mind curriculum implementation and the student learning that occurred last year. The interview will be audiotaped for transcription and analysis purposes only.

The decision to participate in this research study is voluntary. You do not have to participate and you can refuse to answer any question. Even if you begin the web-based online survey, you can stop at any time. Your decision to participate or not participate will have no effect on your standing in your school and/or district.

There are no foreseeable risks or discomforts to you for taking part in this study.

There are no direct benefits to you from participating in this study. However, your responses may help us learn more about how the Tools of the Mind curriculum impacts student learning as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

You will not be paid for your participation in this study. However, if you were to be interested in the final report that I generate, I would be happy to provide you a copy. Simply email me at the web address below and I will be sure that you get this document, once completed.

If you have any questions about this study, please feel free to contact me, Moira S. Rodgers, at 508.237.9322, or via email at smithrodgers@hotmail.com, as I am the person mainly responsible for the research. You can also contact Margaret Dougherty, the Principal Investigator, via email at m.dougherty@neu.edu.

If you have any questions regarding your rights as a research participant, please contact Nan C. Regina, Director, Human Subject Research Protection, 960 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.7570, Email: irb@neu.edu. You may call anonymously if you wish.

Please keep this consent form for your records.

Thank you for your time.

Moira S. Rodgers
Northeastern University: College of Professional Studies  
Name of Investigators: Margaret Dougherty, EdD, and Moira S. Rodgers, student researcher  
Title of Study: Structured Play and Student Learning in Kindergarten: An Outcome Evaluation  

Request to Participate in Research: Interview  

Dear Early Childhood Curriculum Director:  

I am inviting you to participate in a one-on-one interview to ask you questions that relate to the outcome of the analysis of DIBELS data and the 2010-2011 implementation of the Tools of the Mind curriculum in four kindergarten classrooms in the [Oceanside] Public Schools district.  

This interview will take place during the week of August 24th and will take about 30 to 45 minutes. If you decide to take part in this study, we will ask you answer a series of questions and provide your opinions about the 2010-2011 Tools of the Mind curriculum implementation and the student learning that occurred last year. The interview will be audiotaped for transcription and analysis purposes only.  

The decision to participate in this research study is voluntary. You do not have to participate and you can refuse to answer any question. Even if you begin the web-based online survey, you can stop at any time.  

There are no foreseeable risks or discomforts to you for taking part in this study.  

There are no direct benefits to you from participating in this study. However, your responses may help us learn more about how the Tools of the Mind curriculum impacts student learning as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).  

You will not be paid for your participation in this study. However, if you were to be interested in the final report that I generate, I would be happy to provide you a copy. Simply email me at the web address below and I will be sure that you get this document, once completed.  

If you have any questions about this study, please feel free to contact me, Moira S. Rodgers, at 508.237.9322, or via email at smithrodgers@hotmail.com, as I am the person mainly responsible for the research. You can also contact Margaret Dougherty, the Principal Investigator, via email at m.dougherty@neu.edu.  

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Please keep this consent form for your records.  

Thank you for your time.  

Moira S. Rodgers
Appendix G: IRB Approval

NOTIFICATION OF IRB ACTION
MODIFICATION APPROVAL

Date: June 13, 2011
Principal Investigator(s): Margaret Dougherty
                      Moira S. Rodgera
Department: Doctor of Education Program
College of Professional Studies
Address: 50 Nightingale Hall, Northeastern University
Title of Project: Dynamic Indicators of Basic Early Literacy Skills (DIBELS)

MODIFICATIONS:
1. Participating site changed;
2. Open-ended questions removed from online survey;
3. In addition to online survey, teachers will be invited to participate in either a follow-up focus group or one-on-one phone interview;
4. The early childhood director will also be invited to participate in a separate one-on-one interview;
4. Focus groups and interviews will be audiostaped; and
5. Initial and reminder teacher email invitation/consent forms for online survey revised to reflect changes in study procedures.

NOTE: A separate modification request for the Phase II focus groups/interviews which will include consent forms and interview questions will be submitted by the researcher to the NU IRB for review and approval prior to implementation.

Participating Sites: School District Permission and Data Use Agreement on File
Original Protocol Approved: December 16, 2010
Most Recent Approval Date: March 8, 2011 - modification
DHHS Review Category: Expedited #5, #6, #7

Informed Consent:
As per CFR 45 46.117(c)(2) Signed consent is being waived as the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally secured.

Monitoring Interval: 12 months
APPROVAL EXPIRATION DATE: DECEMBER 15, 2011

Investigator’s Responsibilities:
1. The informed consent form bearing the IRB approval stamp must be used when recruiting participants into the study.
2. The investigator must notify IRB immediately of unexpected adverse reactions, or new information that may alter our perception of the benefit-risk ratio.
3. Study procedures and files are subject to audit any time.
4. Any modifications of the protocol or the informed consent as the study progresses must be reviewed and approved by this committee prior to being instituted.
5. Continuing Review Approval for the proposal should be requested at least one month prior to the expiration date above.
6. This approval applies to the protection of human subjects only. It does not apply to any other university approvals that may be necessary.

Coleen C. Pantalone, Ph.D., Vice Chair
Northeastern University Institutional Review Board

Nan C. Regina, Director
Human Subject Research Protection

Northeastern University FWA #4630
The interviews occurred on the following dates:
- Teacher 1 (Ann) was interviewed on Friday, September 30, 2011
- Teacher 2 (Beth) was interviewed on Tuesday, September 27, 2011
- Teacher 3 (Cindy) was interviewed on Thursday, September 15, 2011
- Teacher 4 (Deb) was interviewed on Friday, August 26, 2011

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Q</th>
<th>1.) What was successful in the implementation of Tools of the Mind?</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>I think the biggest success is how stress free the children are – how they just learn so naturally and nothing is forced on them. How everything is scaffolded to their individual needs. They really find no stress in the whole approach to writing which is fantastic and the self-regulation has been wonderful as well.</td>
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<tr>
<td>2</td>
<td>a</td>
<td>So much of it – the writing piece was what stood out tremendously for me and the fact that children were able to write with no anxiety and write about anything they chose</td>
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<tr>
<td>2</td>
<td>b</td>
<td>The other thing that I found was a surprise was how well the chunking of the word groups went. I was like magic how the children learned those and applied those to learn new words</td>
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<td>2</td>
<td>c</td>
<td>I loved the graphics practice. I found it was a wonderful way to ease them into formal handwriting in a much more enjoyable way</td>
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<td>2</td>
<td>d</td>
<td>And I think one of the biggest things was that the program has the children being expressive as opposed to the teacher talking at them all the time. Having them working with partners a lot of the time, have them verbalize and express themselves and have them so much more actively involved than they would be in a traditional curriculum.</td>
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<tr>
<td>2</td>
<td>e</td>
<td>So I guess it is pretty much the whole program (laugh).</td>
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<tr>
<td>3</td>
<td>a</td>
<td>First thing that comes to my mind is that I was so excited that through the year they about confident and comfortable writers.</td>
</tr>
<tr>
<td>3</td>
<td>b</td>
<td>The self-regulation piece was something that we worked on all year long and I feel for all of them it was successful for all of them. At the end of the school year it became for difficult but sometimes that is to be expected at the end of the school year. The behaviors start to rise a little bit and I remember thinking and feeling like “well, I’m not so sure where we are now” because of the last two weeks of school seeing some of the behaviors I saw more at the beginning of the year. Some of them sort of appeared again. Also, the holding on to the working memory piece – that was great! I think that was very interesting for me. I am very interested in the program.</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>For me it was opening group; my kids had a stress free, developmentally appropriate kindergarten year as opposed to the previous year that I felt was a shoved-down 1st grade; I have taught 1st grade for 10 years and I had taught kindergarten back in the 1990s and then came back and to me it was shoved down first grade; whole group instruction, workbook… (what core literacy series did you use?) Open Court</td>
</tr>
</tbody>
</table>

2.) What was challenging in the implementation of Tools of the Mind?

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Q</th>
<th>2a</th>
<th>I think for me because it was a philosophy that I had previous to using the program it was a little less challenging for me. I had already been teaching in a center-like model and the kids would rotate through throughout the week. And trying to meet their individual needs was something I have always done previous to Tools.</th>
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<tbody>
<tr>
<td>1</td>
<td>2b</td>
<td>But I did find that in the beginning of the year the dramatization piece was challenging -- when the kids would go to their centers and act things out, I felt like I couldn’t get to or be in as many places as I wanted to in the beginning. But this year it has been very different so I don’t know if it was just me not being comfortable with the program yet but that was my biggest challenge last year. But I think that was my biggest challenge last year – managing the dramatization.</td>
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<tr>
<td>2</td>
<td>2a</td>
<td>I think initially implementing the entire program, which is a full day program, having had training just a few weeks previous to that was challenging. An initially launching the program and keeping up with the changes that happened but naturally that is going to happen with most programs the first year you teach it.</td>
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<td>2</td>
<td>2b</td>
<td>We needed to supplement the math and although that wasn’t a terrible challenge, it was something that we weren’t clear exactly what they wanted us to cover. And although they gave us several activities, it was not a full year’s program. So we had to supplement it which we did and then we were very happy with it.</td>
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<tr>
<td>3</td>
<td>2a</td>
<td>I did feel it was a world wind of training and trying to implement at the same time. I felt that was quite difficult. As a teacher, I felt that there wasn’t much time to process and reflect. It was “here it is and get going, you’ve got to do it tomorrow”. So that I felt was difficult. So it was a lot of implementing and learning at the same time.</td>
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<tr>
<td>3</td>
<td>2b</td>
<td>The most significant challenge was trying to learn it (the curriculum), being trained, and implementing it as the same time.</td>
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<tr>
<td>3</td>
<td>2c</td>
<td>I found for my higher level students that they weren’t challenged. The ZPD, as much as Tools really stressed that and how much we learned about that, I felt that it was really necessarily so. – Years prior to teaching Tools, I felt like I could address the needs of my higher thinkers more easily in my program versus the Tools program. Granted it was my first year implementing Tools so my focus was really on trying to implement with fidelity to the program. By sticking with fidelity to the program, I wasn’t necessarily reaching my higher level students as well as I would have liked to.</td>
<td></td>
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</tbody>
</table>
3 2e  Switching the way we did certain things. That was a bit of a challenge. Not having an interactive word wall. This was a bit of a challenge and a change for me in my letting go of that. The letting go of things I thought were tried and true, to me, that was a bit of a challenge (laughs).

4 2  Challenging part for me was the learning curve of the curriculum – it was difficult – I have taught for 28 years and all of sudden I had to change some of the things that I used to do automatically. I can give you an example: and I would be praised for this and written up for this as something that was phenomenal. For example if we were writing the letter “b” I would ask them to write 5 “bs”. I would be thinking that I was not only accomplishing the writing but also accomplishing math. But for Vygotsky this would be too much for their brains. So I had to re-learn and trust what TOM was telling me to do would work.

3). Here are the DIBELS results for the Initial Sound Fluency (ISF) ______. What is your reaction?

1 3  I think that possibly it could be that the kids were further along than just focusing on the initial sounds by that point in January. I know that when kids typically do the DIBELS when they start being able to blend and notice other sounds that that (ISF) starts to drop off because they are noticing other sounds in the words or pictures that we are giving them. That’s my initial reaction.

2 3  At the beginning of the year when students are starting to write in Tools, there is a huge emphasis put on the initial sound. They are actually encouraged to find the initial sound and write it – there is a huge emphasis. In the winter we have moved on to focus on other areas, perhaps more on phonemic and nonsense words. So maybe especially speed-wise their focus is not so much on the initial sound any more because they’ve moved on to the whole word.

3 3  It doesn’t surprise me knowing what I know about Tools.

4 3  I’m surprised at this because of all the writing and the ISF is so much a part. Tools kids have to put the initial sound on everything. That really does surprise me.

4). Here are the DIBELS results for the Letter Naming Fluency (LNF) ______. What is your reaction?

1 4a  I would attribute that to the “I have who has” game that we play constantly in their center work. And the amount that they are writing. You know, from day one they are using the sound map and listening to sounds and then finding the letters, listening to the sounds and then identifying the letters.

1 4b  I also think that not having them sit and listen to me talk at them for hours on end is a big factor as well. They are constantly engaged, they are learning for themselves. They aren’t learning because I want them to learn.

2 4  Letter naming is a very abstract skill – it is putting a word that has no meaning to a symbol – it’s like learning a foreign language. I believe that in the Tools, there are so many activities that are in game format which reinforce that. We have the “I have who has” games which the children love. They are using their sound maps every day to do their writing so perhaps there is some private speech going on and they talk about the letters as they do their writing. So that’s what I think would probably affect that. I am somewhat surprised that the Tools kids are above because I know that the Open Court does a lot of drill and focuses on letters and letter names. But I think that because the Tools approach is to introduce material in game form and to introduce reform in a way in which the children learn – nothing surprises me! They are learning on a level that they learn on and not on a level that we want them to learn on (laughs).

3 4  That surprises me a little bit because there wasn’t the explicit instruction that normally there would be.

4 4  Not surprised. What I love about it is that Tools – it goes back to my learning curve; In the past my class has always done very well on DIBELS and I have been very pleased but that has not been without some sort of drill and practice. So to step back and trust TOM and see what happens was a leap of faith; But, once it got going …OMG this is phenomenon; I had the alphabet up but I didn’t do letter of the day, I didn’t go over it. We played games to learn the letter names like “I have Who has” – game. What a nice stress free way for the kids to just soar.

5.) The DIBELS results for the Phoneme Segmentation Fluency (PSF). What is your reaction?

1 5  Wow! I think that all of us with the amount that they are writing and they are sounding out for themselves constantly. Every single day when they are doing their writing they are listening for those sounds and they are counting those sounds… I mean it is just part of their nature at that point. Phoneme Seg is not difficult for them at all.

2 5  As I said before, the writing portion and the reading portion – they are starting to read the decodables – they are spending an awful lot of time looking at the different components of different words and sounding them out and listening and using all of those good skills. Also, we are using the Ekonin boxes – and there are various levels of the Ekonin boxes and those are in centers daily. I think that the Ekonin boxes along with visuals that we have an awful lot to do with that.

3 5  I’m not surprised at that because with the writing aspect of the program, it is a daily piece, a daily component of the program.

4 5a  This is not surprising; this is what they are doing all day long; part of what they do with their writing; games segmenting; in all activities; in January with centers – they are independently writing; It is not an isolated tasks. They are segmenting all day. It flows throughout their day.

4 5b  Oh, just to tell you, Nauset does a writing benchmark and the Tools kids blew everyone out of the water. Because the kids had all the sounds and words. By the end of the year we all ended up in about the same place. It was very exciting.

6.) Here are the DIBELS results for the Nonsense Word Fluency (NWF) ______. What is your reaction?

1 6  That surprises me a little bit because of the amount of work we do with word patterns. I don’t know if the kiddos were trying to focus on searching for the word patterns instead of just giving us the sounds they hear so they can blend the word. That could have hindered them a little bit.

2 6  Oh this is very funny, I saw this happen at the end of the year. When we first do nonsense words, the students are looking at the individual letters and sounding them out and they have not yet done the chunks. At the end of the year, when students are looking at words to decode, they are looking and some of them actually said to me “where is the word pattern?” “I can’t see the word pattern in this” Because they were focused on finding the word pattern they
7.) Can you provide examples of the way(s) in which the Tools of the Mind curriculum builds early literacy in ways not tested by the DIBELS?

1 7a The writing. The writing is such a huge part of their program and the way that they are presenting the letters. They are teaching the sounds first instead of having to ID the letters first. It's almost like a backwards approach to other programs we've used in the past -- where you are learning the letter name, then you are learning the sound, then you are learning how to form them and use them to make words. This comes through the back door doing the writing first, learning the sounds and then looking for those pictures (on the Sound Map). So that is a huge part that the DIBELS is missing -- some sort of writing component.

1 7b We don't test for retelling but the kids story comprehension is amazing as well. By doing the Story Lab every day where kids are making connections with other stories, making connections with themselves. Learning the vocabulary through Magic Tree House books that are studied for 2nd grade we're introducing them to these monsters of words and they are understanding them and they are gaining knowledge that way as well. As well as using the informational texts that we give them as we build background knowledge the week before we start a Magic Tree House book.

2 7a Tools connects the written to the verbal in such a significant manner that it is very useful in every day life and more meaningful. Also, as I mentioned, I think the word patterns which are not any part of DIBELS are a tremendous factor.

2 7b All day long the children are exposed to writing whether it is in the mystery question, whether it is in their own writing "I am going to be..." and who they are going to be when they are dramatizing, whatever it is they are linking their verbal words to written words constantly. And usually, because it is their own writing and not just something they are reading, it has become more intrinsic -- embedded in themselves.

2 7c With the writing prompt, we saw a tremendous change. Usually with the first writing prompt, children are saying "you wanted me to write? I can't, I don't know how to write" but now they say "Oh, you want me to write something? Okay, what do you want me to write?" The confidence is tremendous.

3 7a The language piece. There is so much share the news, of teaching them to have conversations, sharing with their buddy, talking and sharing, and having conversation in the classroom. I do believe that is a huge piece of literacy development. Sharing their understanding of things. I remember at the beginning of the year with drama and the fairy tales -- understanding their roles as characters, drawing it, sharing it, and then performing it all are great early literacy activities.

3 7b The writing I thought was fabulous. Starting from day one with them thinking that way. Thinking about what their message is, what their plan is and starting where they are at and using the Sound Map and the dynamic assessment and be able to give one on one scaffolding -- one on one support to support them and bring them along in that area. I just loved that. I loved seeing that development in them. The Write Along, the Graphics piece I think just all tied in together very nicely so that as the children progressed through the year, the skills progressed. It sort of all came together nicely towards the end of the year so by mid to late spring, school ending, to be able to give them a Write Along or a Tongue Twister, or anything I wanted to give them. They could use their skills that they learned through the Graphics Practise, and the Write Along, and the Message of the day and put it all together. I thought that was great! And for them to confident, happy and non-stressed and very capable to write. That could be one of my favorite parts of the program.

4 7 The writing is the biggest part but there is also the part with the reading -- because they have to read back their writing. The reading and writing are enmeshed. They have the buddy who is checking what they are doing; the reading flows into the writing; most of the children that I send to 1st grade beyond beginning 1st year. Because I was using text that I was using at the beginning of 1st grade level and they were beyond that.

8.) In your opinion, is the DIBELS a valid measure for assessing literacy skills learned by students experiencing Tools of the Mind?

1 8 I think is a part of how we should assess them. I’m not sure it is the best way but I think it could be a part of how we assess them. I mean I think DIBELS does give some great information. I’ve always thought that no matter what program we are using. But I think there is so much more to early literacy skills than just what DIBELS assesses.

2 8 I do think it does have some validity. I think I used to think it was a more complete measure than I now do. But I do think it is probably the best quick assessment that I’ve ever seen. You get so much information in such a short period of time. But I don’t think it is complete now...I almost think now that they could do word patterns or some fluency at the kindergarten level with the Tools kids.

3 8 It is partial assessment. The verbal expression piece, their comprehension piece, the retelling piece are not part of the DIBELS assessment and having them show their understanding in other ways...

4 8 I think DIBELS is valid but we can improve on stuff; there is more that we could do. But that is the benchmark that we have to do. For now it is a good indicator.

9.) Can you provide examples of how the self-regulation skills that are developed through this curriculum have made a difference in student social-emotional and academic growth?

1 9a The independence that it builds, and the focus that it builds, and the culture it builds in the classroom. I feel like it is a much safer environment as kids are trying to regulate themselves, and if not regulating themselves, regulating others. It builds such a bond.
1. They take on the responsibilities for themselves. The fact that they can move independently from one activity to another without a ton of teacher direction and I can give them the activities that they need to do for an hour-long center time and they can manage to get it all done and still have time for extras is the biggest part of self-regulation. That has been wonderful with Tools.

2. I see that when the children were doing something to promote self-regulation, such as a finger play, something that is trying to involve children, children who might be more easily distracted or who might not have their full focused attention will not want to miss out on the social aspect so they will join the group.

2. I also feel that it is something we do as a team, so it adds to the feeling of teamwork. In addition, a lot of the self-regulation pieces require that everyone helps so I think it gives them a better ability to work with partners also and then of course their focusing is better so their academics are going to improve.

3. I feel they did learn as the year went on, I saw them processing more, and remember more what to do in a situation, so that they were a little bit more comfortable, and they would freely have a conversation with a student and not be as impulsive with their reaction to a situation. I feel that was due to the Tools program.

3. With their learning plan, that was a process that involved having them understand and complete the learning plan. And hold on to multi-directions. That was modeled of course and then they practiced, practiced, practiced. But they were able to do that. There was a lot that they were holding on to. That was a great improvement, a great plus.

4. I had several special needs children who came into kindergarten and had difficulty regulating themselves between the Freeze Game and Community Building game and Attention focusing games – I have one little boy who was my poster child for Tools – he had huge improvement!! He was so invested in what was going on when he had to sit down at a seat to do a task – he was so immersed in it. This is a child who couldn’t sit still in pre-school. LOVED the dramatization. The dramatization piece was very key for all the kids and acting that out. That piece, starting the year so heavily with the dramatization of the fairy tales set the tone early on for self-regulation and then we could build on that.

10.) Can you provide examples of way in which the Tools of the Mind curriculum allows for daily differentiation of student learning?

1. It is constant differentiation with the scaffolding that is built right into the program. Kids are constantly learning from one another; they are learning at their own pace; they are not comparing themselves to anybody else in the classroom and you are able to hit them quickly and bump them to where they need to be if you need to push them a little bit harder in one area, you are able to do that and it doesn’t always necessarily have to be the whole group on one skill. It can be that you are getting them quickly when they are doing their writing or you are getting to them quickly when they are at their center. Having it built right in there is so fantastic. It is tailored for each individual child which is something I have never, ever experienced before. It was always me trying to think of the different activities to try and group kids with similar areas of skill or strength but they might not all mesh together so it really, really helps meet the individual needs of the students.

2. Absolutely! Part of it, I can start with the writing. In the writing area, some students it is totally scaffolded. Same with the reading – later on with the decodables, it is all scaffolded too. Where some children can only draw lines, some students are doing initial sounds, some children are doing initial and ending sounds, some children are doing entire words. And they All students are feeling successful at their own level.

2. The same thing happens when they start to decode. Some children are reading step 1 decodable readers, or some children are starting to read step 2 or 3 decodable readers when we start to read together at the end of the year. That is how it becomes more individualized.

2. There is an awful lot of helping each other, too, so there doesn’t always have to be a right or wrong so students’ self-concepts are built in this way as they learn from each other.

3. That was the piece that I had challenges with. As I said we were trying to learn the program, and stick to the fidelity of the program. If I were doing it this year, having more of an understanding of it, the philosophy and having more of that in my head, I think it would be easier to bring in other activities. What I ended up doing was sending home more things to do. Things like a home-school book bag – that is not part of Tools. At some of the centers, I would provide higher level activities for children who I know that is what they should be doing.

3. I really loved the study buddy component – the reading buddy component of the program. I really did enjoy that. The other successful component was the traveling jobs. The music for transition time was excellent. The clean up song for transitions was great.

4. It is all individualized; it is all scaffolded for each individual child – that is the beauty of it. The groups switch constantly – never in a homogenous group. When they are doing their writing, I am scaffolding for each child. Everybody isn’t doing the same thing. The scaffolding is for each individual child. ZPD.

4. In January, when we start meeting on Friday afternoons to meet about their center plans and pick a goal for transitions was great. The children love it. They know what they need to do and they come up with really good ones (goals) – we talk about what they feel they should work on and they are so on target; For example, “I really think I need to work on adding more words to my sentence” or “I think I need to work on listening” – I mean they’ve got it! I think the whole program is designed to individualize.

11.) Can you provide examples of the way(s) in which the Tools of the Mind curriculum resulted in student learning in ways not realized by other kindergarten curricula used in the district?

1. I think the biggest thing that stands out for me is that they are really, truly learning for themselves. They are taking the ball on everything. I am giving them the tools and they run with it. They become invested. They are constantly engaged which is something that with every other program I’ve used, you (teacher) are teaching them, and they are learning for you. Rather than I am giving them tools and they are learning for themselves.

2. I have two academic examples: One is, Again, the writing prompt – I think by the end of the year all students are feeling some confidence with writing but the first and second time there was a lot of anxiety. Students were not feeling good about themselves that they were unable to write even if I gave them squiggles to represent writing. Whereas every Tools child sat down and said “Okay, you want me to write? I’ll write what I can.” Whether they
2 11b The other example is a funny example. My classroom has big windows that look out onto the front of the school. One day a truck pulled up and it was right in front of the windows. The children were sitting down to snack and one of the children, his face lit up like I’ve never seen before. He walked over to the windows and said “I see “aul” and another one said “I see “aul” and they walked over, the entire class, enthusiastically and started to read the words on the side of the truck. They found all the word patterns in the words “Paul’s Plumbing and Heating”. It was one of those days when the fireworks went off. Very exciting.

3 11a One of the things that I enjoyed and that I tried to work on was the non-raising of hands. I liked it and I didn’t like it. I liked it because it helped me to focus on the whole choral response. It forced me to do more of it than I had done in the past, the partner share, turn to the buddy with the eyes to eyes, knees to knees, the student engagement. There were more students talking.

3 11b Another thing was the whole philosophy: slowing down and not trying to teach too many things at the same time – which I thought was good. So decide on what the skill and focus on it. So you are helping them to sort of declutter their brains and helping them to focus on the skill we are learning and concept that we are learning. I think that was different from a typical curriculum in a regular classroom.

3 11c The teaching of the reading – that’s different than it would be in a non-Tools classroom.

3 11d The dramatic play – the structured play – that would not be seen in most non-Tools classrooms.

4 11 Virtually no stress – the biggest difference – the lack of stress on these children is amazing. Kids coming out of TOM are engaged learners that had a happy, stress free kindergarten learning experience; I think they are confident, I think they are excited to read, to learn. I think they have all had a very positive experience.

12.) Can you provide examples of the way(s) in which the Tools of the Mind curriculum increased student engagement and enthusiasm for learning and school?

1 12a Well the whole program is set up for keeping students engaged: they are talking to each other, sharing the news, for kiddos who would never have felt confident enough to raise their hand, to volunteer to offer information, this gives them the opportunity. They can turn to their partner and talk to them quietly and build those conversation skills. You are hearing from all of them all of the time rather than just choosing a couple here and a couple there. They are constantly engaged and they are constantly focused on the areas we are working on.

1 12b Using the Magic Tree House books to build the knowledge sucks them right in. In the math and science the games that they provide you – kids find that their learning is fun and that keeps them enthusiastic. They are learning all these skills through games and interactions with one another rather than just teaching and practice, teaching and practice – they are teaching each other and they are learning from one another.

2 12a I think because the children are constantly active, and because there is such a continuity to what they do – they come in and they say to themselves “I’m going to be able to act out a fairy tale today” is something they get very excited about. Someone said “I’m going to be the team leader tomorrow” and someone else said “I get to use the hand puppets in the theatre tomorrow”. They are thinking about all the activities that they have been involved in and get to do the next day and with friends or partners.

2 12b When we were doing the Magic Tree House series the first week is building background knowledge – so when we were learning about dinosaurs, they know that that is what we are going to be talking about that subject that week, they bring information from home, some do research, they get really excited by it and the social studies and science aspect of it gets built up and then applied during the reading is phenomenal. A lot of higher level thinking skills, a lot of application, the higher stuff in Bloom’s taxonomy is completely applied.

3 12a Well, dramatically did, with the familiar fairy tales.

3 12b The high interest magic tree house books and their interest in wanting to take the Magic tree House books out of our library. So she (librarian) ended up getting a lot more of those (laughs). Their interest in those was awesome.

3 12c The thematic approach – I’m very much a thematic teacher anyways so I fit into that very nicely.

3 12d Just having the classroom more student focused – with the choral response, and the comprehension strategies we worked on – always being engaged with the role playing.

3 12e There was an improvement of behavior with self-regulation, and impulse control. I feel in general, that my management skills – I’ve always been interested in developing their independent skills. This fit in, worked well.

4 12a The dramatization and the Magic Tree House books; I was resistant to reading a 2nd grade book to kindergartners; Well, I didn’t know these books and I was asking myself “why am I reading a 2nd grade book with no pictures to kindergartners?” Again, there is my learning curves. And as it got going, and I saw their enthusiasm, I was blown away! I have to go back to another part. The comprehension skills they got were huge. Every day we work on a different comprehension skill like visualization and so the kids would say to me “Oh, that was visualization!” they could use the vocabulary and their comprehension skills for the most part skyrocketed.

4 12b I was resistant. I was looking at the topics we were to teach and they were not topics that we normally would do in kindergarten; for example we did mummies and Egypt. I’m thinking “what do I have to pull to do mummies and Egypt?” But the kids loved it! It got to the point where Jack and Annie were real people.

4 12c The kids were so engaged; the librarian had to order Jack and Annie books for the library because that was all the kids wanted to take home to read; parents wanted to know which ones we were doing so they could buy the next one for a birthday or Christmas gift. I was convinced. Rapt attention!! They’d beg “please read another chapter, please read another chapter”. “What’s the next book?! What’s the next book!”

13.) Can you explain how the Tools of the Mind curriculum has changed your personal disposition about teaching and learning?

1 13a (laughs) Well, I can definitely say that I am less stressed throughout the day – I don’t feel like I am a hamster on a wheel anymore. It allows me to focus on individual kids instead of trying to teach up in front of the class. I can work with small groups, I can work with individuals because kiddos are always engaged and kiddos are always working in different areas. I am so much less stressed. I know what I’m doing for these kids is “right” and it makes a lot of sense. I don’t feel like I’m force-feeding them things that are not developmentally appropriate. It just feels “right” in
my gut, it’s not like OMG I am trying to get these kids to do something that their brains aren’t developed enough to do yet. And you are showing things and teaching things in a way that works with their development and works with how much they’ve grown over 5 years instead of doing things I think they should be doing when they are 8!

The program is so developmentally appropriate. And it allows for them to get through what they can get through. Rather than me force them to get where I need them to be. You know they develop on their own and they go at the speed they need to go at and they are always meeting with success. Which makes my job so much more enjoyable. They are not getting frustrated, they are not crying because they can’t figure out how to spell this or that. It just feels good.

I have taught kindergarten for many years – I’ve seen many programs – I’ve experienced many programs. I have always felt like we have to take a little of this and a little of that. I have also felt as if we were constantly changing programs to find the better one. And sometimes I’ve felt that it’s a shot in the dark. Because this (TOM) is based on how children learn and I can see the effects of the learning in a very positive and enjoyable way. I feel very positively about keeping it as the program in my district. And it’s the program that I would choose to teach.

If I were to teach kindergarten again – Tools or not Tools -- I would want many of the Tools components and techniques in a kindergarten. I would want to have more of the dramatic play. Social stories. Many components of Tools of the Mind I would want to have and have it be more student focused than I have in the past. I would want to continue the self-regulation techniques that Tools has. The freeze song – how can you not have that freeze song and the activities that go on with that?

I’ve talked many times with my colleague, as the years go on, the push and the pressure of kindergarten and feeling like it was more of a 1st grade classroom so Tools did allow us to step back from a lot of the “must dos” that we felt were more like what might be done in a typical grade 1 and relax a little. I definitely think it was a more relaxed atmosphere for teachers and students. And it allowed us to feel like there should be this time given to the students to do their role playing, and have time to converse instead of rushing through all the academics, and give them the time to process things and share it, thinking about it, think about the process of it and write it down – whether it be in a drawing, or writing, and then follow through with that without the time constraints or the pressure from the teacher who has to do so many things. It gave us the time to really get into it (the learning).

I think I’m still the same person. But I think with Tools I am teaching more of what I believe versus what the government or someone else is telling me.

With Tools, it is a different journey -- the first journey (academically-focused kindergarten) was stressful and I ached for my little 5-year-olds sitting at tables with their pencils and workbook sheets; But this time (with Tools) they were doing developmentally what they were supposed to do. So I felt the gift the time.

Was I stressed this first year of implementation? Oh yes! I was stress about my own learning – I mean I carried my manual around like a Bible -- but I enjoyed my class.

I think everyone was relaxed and happy. I didn’t have kids crying and I didn’t have kids going to the principal for behavior as I had in the past…

You know, when you are forcing the learning -- like “I have to get this curriculum done by this date” you run into problems. I’ve said to myself “I can’t, I can’t, I can’t shove any more into this little sponge! It is soaking wet already!”

My colleagues who are non-Tools are really wanting to have the Tools so badly. They agree, they know that what they are doing is so wrong. This is not right for our clientel. Trust us! We’ve been in this field, we know our children!

For example, with the Nauset writing prompt – Pre-Tools I was asking them to do something that wasn’t a natural part of their day versus Tools – it was just automatic. It was fine. Whereas before I had to say, “Here is your writing prompt, I can’t help you, I need you to write about something you do with a friend” Some cried. Some looked at you like “huh?” “I had one girl scribbling. Then she erased the whole thing and said to me… I did it in cursive. I’m sorry.” She couldn’t do anything. Why are we bringing this on them? Tools is much more gentle and the brain-based aspects make sense to me.

My colleagues are hoping that in a year or so we are going to adopt it district-wide.

What is your overall assessment of Tools of the Mind?

I think it is fantastic. I think it has all the different components that we need to make kids ready for 1st grade. To make them love school and that they want to come back and they want to keep learning.

I feel that it is an exceptional curriculum that again because it is based on how children learn, it works. A huge part of this program is that it is developmentally appropriate for these children. There are a lot of programs that are not developmentally appropriate. This one is for many reasons including the level of participation, the game form, and expressiveness. Children love learning and for children who are having their first learning experience it is wonderful to have them love to learn.

I think it is a wonderful program. I need to do more of it. Because as I said, the training and the implementation were happening at the same time so there wasn’t a lot of time for reflection. So to say I’m a 100% believer – I’m not there yet. I need to do more of it. Ending the year last year, I certainly was on board. I would want to do Tools for a few more years to really know. But I’d say it is wonderful.

I am thrilled with it! I’m absolutely thrilled with it! Areas that I feel we need enhance would be the math portion; I think my kids are going on well;

I would stand up and tell everybody to do Tools – it makes sense and I would love them to be able to open their hearts and their minds because the result is night and day.
## Appendix I: Director of Early Childhood Interview Transcript

Eve interviewed on September 15, 2011

<table>
<thead>
<tr>
<th>Q</th>
<th>A</th>
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<tbody>
<tr>
<td>1. What are your impressions of the Year 1 of the Tools of the Mind implementation?</td>
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<td>1.a</td>
<td>When I contrast it to years past...I did not have one behavioral issue. So I went back to look at last year and the year before and there was probably 3 dozen where the teacher had to remove the student from the classroom, where a child control restraint had to be put on -- this year, not one.</td>
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<td>1.b</td>
<td>In looking at the curriculum, in looking at the manuals, I've looked at them so many times, I see the intricacies and the thought...you aren't just doing the freeze game because you want the children (to stop) there are so many intricate cognitive skills that that kids has to use in the simple act. I think the cleanup song is a miracle.</td>
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<td>1.c</td>
<td>The teachers have stopped talking; The children are talking and the children are supporting each other</td>
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<td>1.d</td>
<td>I am fascinated by the remarks and the comments children are making about the timeline calendar. In comparison and contrast, the scaffolded writing, the turn and tell a friend, amazed</td>
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<tr>
<td>1.e</td>
<td>The language and so full of language, the scaffolded writing, the talking is learning, draw to remember...I get goosebumps. I have them now. I can see -- you can see them think -- it is amazing.</td>
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<td>1.f</td>
<td>We had a little boy who was a grump. He didn't talk very much. He started Tools and now we can't shut him up. He's in a video that Barb uses in training. He's waiting for 12 minutes, he's laughing. The teacher then says “it's time to clean up” and he says “I haven’t placed my order yet”. He was just an absolute delight.</td>
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<td>1.g</td>
<td>I stand in amazement every day.</td>
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<td>2. What were the successes? and What were the challenges?</td>
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<td>2.a</td>
<td>Successes: From the data I collected, I would say a great increase in working memory; also inhibition; I have to say the biggest one was working memory. And remember most of our kids have language based disabilities and the fact that this curriculum can impact them in this way. These kids can write a play plan -- all the supports, the sound maps -- the visual icons make a tremendous difference.</td>
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<td>2.b</td>
<td>Challenges: Jumping in and letting go of former/in-grained philosophies -- step back and not being in charge and control of things. The sitting in circle for 45 minutes a day is gone. It’s gone. Another challenge is getting all the activities in. The teachers work very well together even though they are in separate buildings. The first year was tough because you are doing it while you are learning it – but I don’t think you could do it any other way. I don’t think this is something like you could take a 15 week course and then go back into the classroom and do it. So it’s rough, it is rough. But this year, it’s like a piece of cake.</td>
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<td>2.c</td>
<td>Administration has been very supportive but the challenge will be finding the funds for the other six non-tools teachers to be trained in Tools.</td>
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<td>3. What was your impression of the DIBELS results of the Tools of the Mind classrooms compared with the non-Tools of the Mind classrooms?</td>
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<td>3.a</td>
<td>I did the analysis. We were told by Tools people that there would be a good chance that the Tools kids would not be at the same level as our “best practices” (non-tools) classrooms. Wrong. Wrong. We met and in cases exceeded classrooms. And the Tools kids were not pulled out to do ERI (Early Reading Intervention) no 3-tiers, no RtI. They use this strategy – at risk or some risk kids would get 20 minutes extra a day 5 times a week -- in the best practices classrooms. Educational assistants do the ERI.</td>
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<td>4. Is the DIBELS capturing the data that provides an accurate reflection of the literacy skills of the Tools of the Mind students?</td>
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<td>4.a</td>
<td>No, but we do a writing prompt in this district in fall in spring. (common assessment); That will blow your socks off. The Tools children meet and exceed the benchmark expectation with the district writing prompt --- the written language, the organization, the working memory – “draw to remember”.</td>
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<tr>
<td>5. Characterize the kindergarten teachers impressions of the curriculum and its effectiveness</td>
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<td>5.a</td>
<td>Teachers all to a “I” love it and said they would never go back and “you can’t make me” – that is a quote from all four teachers “I love it and I will never go back and you can’t make me”; It was hard but, the other six teachers who are not doing Tools want to be doing it.</td>
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<td>6. How did parents react to the curriculum?</td>
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<tr>
<td>6.a</td>
<td>Very positive. Parents love it; not one challenge from parents, very positive – when we do our open house parents go through some of activities so that they have an idea – It has been embraced in both communities where it is being implemented – maybe because the teachers are so enthusiastic and open. It has increased the level of communication between parents and teachers. Because parents are as engaged as the children are. Parents are asking for the teachers manuals to read. It’s phenomenal.</td>
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<td>7. Describe any unanticipated issues that resulted from the implementation</td>
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| 7.a | Moving to 1st grade – there was a brief bridge to 1st grade workshop where the 1st grade teachers in the district who are getting the Tools kids were trained. However, it needs to be a bigger training. We have one first grade classroom in this building. So all the kindergarteners went into her classroom. She is a phenomenal teacher, but I can already see some
behaviors. If we had been Tools-ified a little more so the kindergarten teachers and I are going to meet with her and give her some more things to do to keep the kids engaged in learning.

8. Overall, what is your assessment of the Tools of the Mind curriculum compared to the other literacy program being implemented in the other kindergarten classrooms.

8.a No comparison. Tools is highly effective in comparison to part curricula that we’ve implemented. We have never had the outcomes with the out students. There are best practices that the other teachers are doing but the level of intervention needed with other programs. That’s the thing. Tools is a comprehensive curriculum–this isn’t reading here, and math here, and social studies here, and science here.

8.b It is comprehensive and you have to do everything or you will sabotage your outcomes. It says it right in the manual. Where do you ever read that in education? You will sabotage your outcomes! Bottom of the yellow book – the philosophy book.

9. Is the district realizing the benefits and meeting the goals it set when deciding to implement the Tools of the Mind curriculum? Will it be extended to the other kindergarten classrooms?

9.a This is all in process. I will be looking to present this information to the school committee and superintendent in November. They like to bring out the shiny toys and the successes.

9.b We’ve begun discussion of how to procure money to train the other teachers.

Table 26
Coding Table of Director of Early Childhood Interview Responses

<table>
<thead>
<tr>
<th>Research Question Focus</th>
<th>Inductive Categories</th>
<th>Response</th>
<th>Reference (Question number. Question part)</th>
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<tbody>
<tr>
<td>Curriculum Related</td>
<td>Curriculum Effectiveness</td>
<td>Design of learning</td>
<td>1.b, 1.e, 2.a</td>
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