THE INFLUENCE OF RESPECTING THE INDIVIDUAL CHILD'S LEARNING SYSTEM ON EARLY ACADEMIC DEVELOPMENT

by

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DEDICATION

To my husband

Hank

For your continued belief and encouragement of me
as a person and as an educator.

You are my best friend, my best teacher, and the best man I know.

Your genuine love and wisdom inspire me everyday of my life.

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INTRODUCTION

"I believe that unarmed truth and unconditional love will have the final word in reality." (Martin Luther King, Jr., Braineymedia.com, 2008a).

This dissertation chronicles the ongoing process of my development into an educator with the desire, insight, and understanding necessary to positively impact the learning abilities of each individual student entrusted to my care. As with most adventures and struggles, each life experience has impacted my being, resulting in a sense of purpose and meaning and culminating to date in this body of work.

The following pages of this text offer a description of my ongoing journey. Chapter 1 seeks to examine significant circumstances and frustrations which have led me to my current role as an educational leader, and perhaps more importantly, to my belief in, and commitment to respecting the individual learning system of each child.

Chapter 2 explores the literature relevant to this study inclusive of a discussion on the difficulties of defining intelligence, a review of the origins of intelligence testing, an examination of the Factor Analytic Theories of Intelligence, followed by a detailed explanation of Guilford's (1967) Structure of the Intellect (SOI) Model, concluding with Meeker's (1969) application of the SOI model to the education system.

Chapter 3 tells the story of the pilot year with Certified Learning Kindergarten (R. Meeker, 2007) and the methodology and tools used to evaluate the program's impact on the students and teachers involved.

Chapter 4 integrates the process of the study with the process of my growth and development as a person and an educational leader. Finally, the chapter will conclude with

my reflections on the implications indicated for the district and my direction as the educational leader.

CHAPTER 1

My Ongoing Journey

"Consider a movie: it consists of thousands upon thousands of individual pictures, and each of them makes sense and carries a meaning, yet the meaning of the whole film cannot be seen before its last sequence is shown" (Frankl, 1984, p. 145).

While certain that most of the individual formative frames of my life's movie remain well below the reach of conscious awareness, general hindsight suggests three broad early childhood influences that have significantly impacted who I have been, who I am, who I am becoming, and where I am going both personally and professionally. As with each of us, the most prominent impression on my personhood lies with my family of origin. As the first born of two daughters, I seemed to naturally take on a leadership role in the family, functioning as an achiever, a mediator between family members, and as the family spokesperson. While at times difficult, this role assisted in my development of personal responsibility, competence, and a sense of autonomy. This role also provided for me a sense of confidence in what seemed at times like a disconcerting situation. If family members struggled emotionally, I supported them by seeking to understand and offering them comfort and encouragement.

I might also mention that members of my extended family, whom I loved and respected, had successful careers in public education. My grandmother and great aunt were both teachers and my aunt served as a principal of an elementary school for many years. They often recounted their memories of the classroom and the students whose lives they had

impacted. I noticed the expressions of joy and fondness that lingered on their faces and in their voices as they reflected on earlier days. I always enjoyed hearing their stories as it made me feel part of their world.

A second major influence in my early childhood was my family's involvement in the worship and service of God in a local Protestant church. I was brought up in Sunday School and had been very involved in Girl Ambassadors for Christ (GAs), which is a mission organization of our church. I assumed a leadership role almost immediately in this setting as well, finding satisfaction both in the affirmation I received and in the message of the love of our Creator for me. I became a Christian as a child and this faith remains at the core of my being. This childhood decision profoundly influences my world-view and deeply impacts my central attitudes and desires, which I am sure consciously and unconsciously permeate throughout this manuscript and my life work. I suppose I may be described as a Christian whose field of service is the education of children.

Almost on a parallel, yet an occasionally intersecting track was the influence school had on my journey. I suppose my pilgrimage toward education as a profession can be traced back to my experiences at the age of seven as a struggling reader in a second grade class. I can still recall the feelings of absolute confusion when I would try to make sense of the letters on the page. I was not able to connect the letters to the sounds they made. My confusion was not lessened by the fact that my teacher, Ms. Fale (real name) showed little compassion for my plight. She continued to drill me with the rules of phonetics and the mantra that I was not trying hard enough. I could not imagine trying harder. I struggled alone with the failure that I confronted every time I looked at the page. After several months of poor grades and misbehavior, my parents withdrew me and placed me in a small church

based private school. With only a few students in the class, I began to make progress. In contrast to Ms. Fale, the new teacher was not critical of my struggles, but instead reached out to me as an individual learner. This teacher, whose name interestingly I cannot recall, seemed to personify Carl Roger's (1983) belief that teachers should be trusting, sincere, prize students, and empathize with them. I could not explain how it happened, but to my child mind, it seemed like magic. I clearly remember looking at the page one day and being able to read. The letters made sense and reading books became my passion. In retrospect, education as an individually applied art became real to me at that time.

The value of individualized learning impacted my life again as a 12-year old when our church youth group volunteered at the local state hospital for handicapped students. I vividly recall the tour through the facility and the "levels" of treatment as determined by the type and severity of the handicapping conditions. The mental images of the separate wards for the blind, deaf and blind, and mentally retarded, as well as children suffering from hydrocephalus, can be easily recalled today. The nurse reported that many of these children needed a friend to interact and play with because some never received visits from their parents. I still remember thinking how abandoned these little ones must feel. These children's circumstance was so far removed from what I had experienced with the security of family and friends; I felt both fear and compassion. I presume that these intense feelings, my early childhood role, the love of God we were sharing and my own perceived inadequacies all combined to make the impact of these visits so memorable.

The hospital staff I suppose randomly selected a six-year old little boy named Jonathan from a group of the relatively less profoundly disabled kids to be paired with me for the purpose of enhancing his socialization. Jonathan's head was so enlarged that he could

not hold it up, and his smile was equally as large. We seemed to connect immediately. In Jonathan's world, joy was a visit from someone, a kind word, or being pulled around the grounds in a red wagon. Jonathan was able to use a computer of sorts and always seemed very eager to interact and learn.

From my interactions with Jonathan, I realize the commencement of three life assumptions that are foundational to my world-view and life work. First, all children are natural learners. Second, the best learning takes place in the context of meaningful and valuing relationships. Lastly, I also found that such relationships produce a pleasurable sense of joy in the hearts of those authentically involved.

These life lessons were being reinforced during the same period, as I became friends with a neighbor who suffered from a debilitating cardiac condition. Sharon was 17 and home schooled because of her disability. She tired very easily and was not able to run or play. Sharon had a swing that she could sway gently on and a small pool in which she could sit. Sharon's parents loved her dearly, but she was very isolated and lonely for the companionship of a friend.

Sharon and I became friends and spent time daily with each other for nearly a year. We would often play board games during which she would express dreams of a more normal life and of having a boyfriend. I remember being struck by the world she had created in her mind to give her hope, and felt very special that she had allowed me to be part of her life experience.

Then, one day as I was standing at the big picture window in the living room gazing at Sharon's house across the street, thinking of the fun we had the night before, my mother came into the room and gently said "Sharon died last night." Sharon had been lying in bed

watching *Marcus Welby, MD* when her parents heard her call out. As they reached her room, Sharon was talking about Heaven with a far away look in her eyes. She slipped quietly away in their arms.

Sharon was not the first person I had lost, but she was the first person near my own age. I grieved for her. However, I also rejoiced that she would no longer be held back by a weak heart. I remember picturing her running through the streets of Heaven laughing and playing with the other children. Later, her mother talked about how much it meant to Sharon for me to come over and play or just listen to her dreams. We are relational creatures who desire meaningful and valuing relationships. I also discovered that such relationships can foster the experience of a very powerful gift called "hope" which dramatically improves personal satisfaction with one's particular life circumstance.

Following these experiences, my family and I began attending a new church, searching for a strong youth program for my sister and me. At that time, I was 14 and as is true for most teenagers, struggling for a sense of identity and purpose. On my first Sunday in attendance, I met the pastor's wife. Until that time, I cannot recall a strong role model in my life. The pastor's wife welcomed me into the youth group with such authentic kindness that I immediately felt a sense of acceptance. She was enthusiastic about her relationship to Christ and I was drawn to the peace and joy I saw in her life. For the next couple of years, I was at the church every opportunity I had. The truth of God's grace and love for me gave me hope, and I wanted to share that hope with others.

One opportunity to share the hope I found came a couple of years later when I spent the summer as a student missionary in a small town in rural West Virginia. The people were very poor, and most of them had not completed high school. One particular family comes to

mind when I think of that summer. The mother looked about 60 years of age, but was only in her mid-30s. Her 13-year old daughter was already a parent, and an education was no longer an option. The family struggled just to survive. The sad thing was that this family was the rule rather than the exception in that area. School was not an option for these unfortunate people as just having enough food to survive took precedence.

I remember thinking what a difference it would make in their lives if they could learn to read and gain the skills necessary to obtain employment. In reflection, while I maintained my first early life assumption that all children are natural learners, I also concluded that this natural ability can be impeded by any number of variables. In this case, lack of reading ability, personal choices, and the vicious cycle of poverty.

These experiences along with my own experiences as a student helped shape the direction I would follow in college. As I reflect on why I had such a desire to become a teacher, I can go no further than the meaning school had for me. School was the place where I felt most successful. I worked tirelessly for the sense of achievement and affirmation that I received from a few special teachers that noticed me as an individual learner. I believe that this accounts for the sense of urgency I felt to empower underachieving students.

I completed a Bachelor of Science degree in Education with an emphasis in Special Education. I received broad instruction in Erikson's (1963) and Piaget's (1952) developmental theories applied to the classroom; behavioral learning theories; methods for dealing with pupil variability; information processing theory; cognitive learning theories and problem solving; motivation; and learning assessment tools. Throughout my preparation to teach, my three personal early life assumptions that all children are natural learners, that the best learning takes place in the context of a meaningful and valuing relationship, and that

these relationships produce joy remained well established. Although not specifically addressed in the college curriculum, the insights I gained from one of my primary professors encouraged and affirmed those assumptions. As she taught educational theory, she enriched it with interwoven tales of her experiences as a teacher of special needs students. She talked constantly of the importance of valuing each child. She spoke of the difficult and often frustrating task of helping struggling students learn. As I recall, she was a cheerleader for the students and her passion for student success was contagious. Her encouragement of me as a potential teacher was a significant influence in determining my life work.

As I look back on my experiences in both church and school, I am aware of the strong parallel influence of both on my life. The acceptance and affirmation I found in both arenas enlightened my heart and infused me with the desire to grow spiritually and educationally. Each profoundly influenced the other. Learning and accepting God's love and grace empowered me and brought my calling as an educator into focus. I wanted other children to have someone in their lives who believed in their value and worth as an individual.

After graduation and armed with new knowledge and fierce determination, I returned to my high school alma mater as a teacher for learning disabled children with the perhaps naive desire to enrich their lives through education. It did not take long for me to realize how unprepared I was to teach these struggling teenagers even how to read. I would drill them on sight words only to discover that the next day I would have to start all over again. They could memorize the words short term, but seemed to have little, if any, concept as to their meaning and could not retain the knowledge long term.

What I was trying to teach them had little if any value in their world. Another problem was that the students were achieving at different levels and all needed individual

attention. But perhaps the biggest problem was the lack of hope these students shared which appeared correlated to lower levels of investment in learning. Many had been in the special education program their entire academic lives and had apparently grown to expect little of themselves or others. How they regarded themselves in relation to the "world of school" indicated to me that the school experience thus far had not encouraged and affirmed them as it had for me.

After what I considered very modest success with these learning disabled students, I decided to leave the special education classroom and try my hand at "regular education." My assignment was sixth and seventh grade language arts in a school that served predominantly military families. I was surprised to discover a significantly wide range of abilities between students in this "regular" education class. I remember thinking I had simply replaced one multi leveled classroom for another. I struggled through the year attempting various strategies and methodologies to help all of my students achieve success. I yearned for them to experience school as a positive vehicle in their lives and not as a place of failure. The students who learned easily seemed much happier at school, and I wanted this for all of my students.

The bright spot in all of these academic struggles of my students was the discovery that when the students were taught at their level of ability and information was incorporated into their subjective realities (their wants, thoughts, and feelings that in conjunction form their beliefs about themselves, their environment and the relationship between the two), their attitudes were positive which resulted in learning taking place. The frustration of this discovery was the lack of time in the school day to work with the students individually. In spite of this frustration, I was encouraged by this insight into learning.

It was during this time I completed a Masters of Education degree in special education. Many of the same learning theories were reviewed in more depth, as was psychology applied to education with a focus on the behaviorally challenged student. While this training in theory was helpful in classifying and labeling observed maladaptive student behavior and learning problems, and provided suggested strategies for addressing each identified problem, it seemed incomplete. Some of the tools were modestly effective with a few students. Looking back, I realize one limitation of this approach was its inability to address the hope producing relationship component that can exist between an educator and a student.

The following summer, my family and I relocated to Fort Worth, Texas, where I accepted a high school teaching position instructing students classified as learning disabled and emotionally disturbed. The number of students in the self-contained class ranged from 10 to18 and the grade levels encompassed freshmen through seniors. Even with a full time teacher assistant, it was a struggle to meet the needs of each student. These young men and women seemed to face the same struggles of my former students. While it was evident that these students were natural learners (each had learned a great deal of non-academic information), most had been in special education classrooms their entire lives without much progress. Once again, the abilities of the class participants were multi leveled and what we were attempting to teach had little to do with their individual subjective realities. Perhaps the most notable similarity to my previous students was the lack of hope they had in their ability to learn, which again seemed correlated to lower levels of investment in learning.

Because I believed that all children are natural learners and that the best learning takes place within the context of a meaningful and valuable relationship (from which hope

can emanate), I went about the task of building a positive relationship with each student. I assessed the abilities of each student and partnered with another teacher who had developed lesson plans designed around the conceptual structures of each discipline that the students could complete at their own pace. It seemed that learning concepts before facts more effectively incorporated information into the student's individual learning system (Erickson, 1998). The result over the next three years was achievement for the students and the strengthening of my understanding of the importance of respecting the individual learning system of the child within the context of a meaningful, positive, hope producing relationship.

When talking to colleagues, I often felt like I was isolated and disconnected. Many did not share my passion for my students' individual needs, seeing teaching as a job that did not need to be taken so seriously. This frame of reference was foreign to me and counter to my concept of what it means to be a teacher.

During those three years, the feeling of professional isolation was lessened by the co-teaching experience with a colleague. We held similar beliefs about the influence of the teacher-student relationship on learning and the importance of seeing each student as an individual. In retrospect, I have concluded that we were running our own pilot school within the context of the high school. Although this caused a separation professionally from other colleagues, the success of the students spoke volumes. I recall both the principal's bewilderment and admiration at the structure and function of our classes. The success of the students encouraged the principal's support of our classes.

A job change for my husband relocated our family to another state. I decided to stay home and be a full time mom to our two young daughters. Parenting is perhaps the best life training opportunity one can experience. From watching my own children, I became more

convinced that all children are natural learners and that the best learning takes place in the context of meaningful and valuable relationships which can produce a pleasurable sense of joy and hope in the hearts of those authentically involved. Additionally, I became more acutely aware of the distinct individual learning systems of children and the importance of concepts before facts instruction. Each of my girls learned and reacted differently to my efforts to teach them.

After a decision for my husband to enter graduate school, I reentered the workplace. I wondered if earlier interventions with some of these struggling learners would better enhance the possibility of later success in high school. With that in mind, I accepted a position as an elementary teacher to students identified as learning disabled and emotionally disturbed. These students ranged in age from six to ten with widely varying ability levels. I spent a considerable amount of time assessing each learner to determine how to best address their individual needs. After consultation with the educational diagnostician, I wrote individual learning and behavioral plans for each child, many of which were non-readers and required extensive one on one instruction. I carefully juggled the schedule to allow for more time with the non-readers while providing independent exercises for the students with more developed skills.

After a year, I found a job in a high school closer to our home. In looking back, I think I was hoping to find a teaching situation similar to the one I had enjoyed in the last high school. Unfortunately, I found just the opposite. Although the other two special education teachers and I shared the same students, we definitely did not share the same teaching philosophy. They encouraged me to stop trying so hard to teach the students, but instead allow them to play games and do things that would keep them from being disruptive. These

teachers did not see the students as capable of learning and achieving. My determination to really teach the students angered these teachers and increased the feeling of separation and isolation that I felt. Any attempt that I made to bring accountability and improvement to the students' learning situation was sabotaged by these teachers. The administration was not invested in the special education program so I saw little chance for altering the system. After a very difficult year, I decided to make a change professionally. I wanted to find a way to empower myself so that I could make a more significant impact on the decisions surrounding student learning.

I returned to school once again, this time to develop the skills necessary to work as an educational diagnostician. Concurrently with my return to school, I sought out and was offered a position as an educational diagnostician for two elementary schools in a local school district.

For the next four years, most of my days were spent testing students that had been referred by their teachers as possibly having a learning disability. At that time, a student was defined as learning disabled if there was a discrepancy of more than one standard deviation (15 points) between his or her intelligence quotient (IQ) and his or her academic achievement. The assumption seemed to be that the students were not performing in school at the level their IQ would predict. I questioned this definition of a learning disability and was troubled by my role as an educational diagnostician. Was I really helping these students by labeling them as learning disabled? It seemed to me that it could be reasonably concluded that a disability inherently implies an unfulfilled ability, so that a disability results from the failure of some, identified or inferred, mechanism in the organism to perform its function. Most of the students classified as learning disabled were placed in special education for the

purpose of closing the gap in their achievement. I thought about these students over the years and wondered if special education was helping them to progress. Removing a child from a class of his or her peers seemed like such a huge precarious step. I hoped that the students had been remediated and were back in class with their peers.

My entry into administration began in 1997 when I was promoted to assistant principal at the high school. As the academic coordinator, I was responsible for all aspects of the state assessment. Once again, I found myself working with students with widely varying ability and achievement levels. The goal for all of the students was the same - pass the state test. For the next two years, my time was consumed motivating and planning remedial activities for students at risk of not passing the state test.

In 1999, I began five years of service as a principal at both the elementary and intermediate level. My priority during these years was helping all of the students, regardless of their ability and achievement level, to meet the passing standard on the state test. I continued to struggle with the classification of learning disability for some of these students as it often appeared that a lack of encouragement and motivation inhibited their success on the state test. Other times, a lack of conceptual mastering was the presenting problem. Many of the struggling students had given up hope of passing the state test. Their experience thus far in school had reinforced their belief that they were not smart enough to meet the passing standard. I wondered if the label of learning disabled contributed to a self fulfilling prophecy for these students.

One of my most meaningful interactions with a student occurred during this time. A third grade student that had previously failed all of the Texas Assessment of Academic Skills (TAAS) benchmark tests stopped me one day after completing the intervention course work.

She asked, “Mrs. Arnold, do you really think I can pass the TAAS Test?” The look of intensity on her face convinced me that my answer to her question would have a significant influence on her attitude as she approached taking the TAAS test. As I affirmed my belief in her ability to pass the test, an enormous smile spread across her face. That April, she passed the test despite her “learning disability.”

My administrative staff and I continued to look for programs and initiatives that would address the diverse needs of the students. While looking for a new way to identify gifted students, we learned about an assessment that measured abilities for learning called the Structure of the Intellect (SOI) Test of Learning Abilities. I was intrigued by statements I read in the SOI literature. *Learning disabilities* were defined as “required learning abilities that are very weak or underdeveloped. The treatment is the development of those learning abilities” (R. Meeker, 1996, p. 62). Additionally, the SOI model identified previously ill-defined abilities and their functions in the learning process. I had not been introduced to this model in my prior educational experiences. This knowledge filled in some gaps, helping me form a better understanding of the cognitive structure of each individual child and how these abilities interrelate. That simple statement confirmed for me what I had always believed as a teacher, a diagnostician, and an administrator. Being identified learning disabled was not a prediction of future failure. Instead, it was an opportunity to develop underdeveloped abilities. Struggling students were not excused from learning because of their disability, but neither were they accused for not keeping pace with the class.

In 2004, I made the move to assistant superintendent of curriculum and instruction. My responsibility for student success had now reached a district level. As the assistant superintendent, I met regularly with the instructional leaders on the campuses. What I

learned in one particular meeting became another defining moment in my educational journey. We were discussing students that the campus leaders had identified as potentially failing the Texas Assessment of Knowledge and Skills (TAKS) Test. The students were listed on a chart with their current reading and math levels. When I read the names, I recognized several of the students that I had tested many years ago as a diagnostician. I was dumbfounded when I realized that some of these students were still functioning at the same level at which I had assessed them years ago.

This discovery further convinced me that finding a better way to address the needs of our identified learning disabled students must become a district priority. Over the next year, the campus instructional leaders, the director of special education, and I met to formulate a plan for identifying and remediating our struggling students. From our combined experience and research, we decided that being able to accurately measure students' developed and underdeveloped abilities was paramount to addressing them.

At this time, the SOI Test of Learning Abilities (R. Meeker, 1996) had been incorporated into the district's gifted program for a couple of years. The district had also implemented Bridges Labs (*Bridges Science*, 2002), based on the SOI Model and designed to address sensory integration dysfunctions and the skills needed for focusing. The district's diagnosticians and administrators had received training in the SOI Model and SOI Test of Learning Abilities and were encouraged by the information about the students' learning needs that it yielded. Some of the diagnosticians commented that the SOI Test of Learning Abilities provided them a better description of the student's abilities than the information they obtained from a traditional IQ Test.

We made the decision to incorporate the use of the SOI Test of Learning Abilities

into our intervention process. Any student referred by a teacher or a parent would be administered the SOI assessment as a first step toward identifying the student's underlying learning deficits. Based on the results of the SOI, the plan of prescription for the student would be written. Having a consistent district process would hopefully afford all of our students a better opportunity to be successful.

The process, which we now refer to as our Response to Intervention Plan, is still in effect in the district. The teachers' increased confidence that most students can be successful in the general education class has positively influenced the district's special education referral percentage, decreasing it from 4.6% in 2006-07 to 1.5% in 2007-08. Although the district's performance on TAKS continues to improve each year, we still have students that experience failure and subsequently, discouragement very early in their educational years. My desire to make an impact on these youngest students led me to advocate being the pilot site for Certified Learning – Kindergarten, based on the SOI Model (R. Meeker, 2007).

At an Advanced SOI Training in October of 2005, I had the opportunity to hear a presentation by Dr. Robert Meeker. The presentation focused on a program Dr. Meeker was developing called Certified Learning. Dr. Meeker had begun developing Certified Learning as an answer to a question posed by a kindergarten teacher. The teacher had asked how she could know that her students were ready for first grade. Dr. Meeker had gathered the national and state standards and developed a program that would assess a student's readiness for first grade in sequential steps throughout the kindergarten year.

I was intrigued by the idea that the program would help the students develop the abilities necessary for success in school by individually assessing them and moving them through the program. If a student had difficulty with a concept, a prescriptive intervention

would be provided to the teacher. The students would be allowed to progress at their own pace instead of at the pace of their classmates. I told Dr. Meeker that if he needed a pilot site for the program that I would like to volunteer my school district.

Over the next few months, I continued to communicate my interest in piloting Certified Learning to Dr. Meeker. In April of 2006, a colleague of Dr. Meeker's presented the concept of Certified Learning to the elementary principals in the district. As principals, they were concerned by the number of kindergarten students who struggled through kindergarten and often entered first grade unprepared. After hearing the presentation, they wholeheartedly embraced the program. The program would be piloted in one kindergarten class in each of the five elementary schools during the 2006-07 school year.

The timing for the pilot correlated with my doctoral studies in educational leadership at Texas Christian University and quickly became the focus of my dissertation study. The pilot was a perfect opportunity for me to put into practice the knowledge and experience that I had gained as a teacher, diagnostician, and administrator. My years of practice at writing individual learning plans and my subsequent demonstration of their effectiveness could be formally tested during the students' first year of schooling. The story of the pilot year will be told in Chapter 3.

It is also probably worthy of mention that as the pilot year of Certified Learning came to a close; my life took quite a turn. In May of 2007, I became the superintendent of schools and subsequently, my realm of influence on the instructional programs in the district increased. As I begin the process of painstakingly reviewing and digesting all of the data from year one of Certified Learning, I am aware of what the impact of this study could be for the district. As the district's instructional leader, I am charged with recommending and

providing the best programs and initiatives to address the needs of our students. My motivation in writing this dissertation is to more clearly bring into focus what those initiatives and programs need to be.

CHAPTER 2

Review of the Literature

"When defining a concept such as human intelligence, the scientific expectation is that the concept entails some fairly robust essentials that constitute its theoretical core" Brandtstadter (as cited in Sternberg & Detterman, 1986, p. 23).

Every author attempting to define the concept of intelligence confronts the fundamental difference of opinions available. In addition, most writers on the subject seek to put forth their own understanding of the meaning of intelligence. While a theoretical analysis of the conflicting positions of the meaning of intelligence is not the intent of this study, an overview of the evolutionary development of the meaning of *intelligence,* the origins of intelligence testing, and a review of the factor analytic theories of intelligence set the stage for the purpose of this study.

My objective in researching the concept of intelligence and the origins of intelligence testing was to answer my own question regarding the labeling of children. I wanted to know how this practice of categorizing children had begun and for what purpose. Primarily, I wanted to find a better way to understand the diverse learning needs of children and most importantly how to address them. As a diagnostician, I had been part of "labeling" children with the hope that the label would allow them access to the educational services they needed to experience academic success. Instead, in many cases, the label seemed to me to define the child and limit his or her growth rather than to liberate them to enjoy academic progress. In addition, the label appeared to be a way of letting teachers and other educators such as myself "off the hook" when a student failed to achieve the expected amount of progress. In

other words, we now had permission to perceive the child according to his or her label. We did not consider the reality of what was occurring inside the child.

My attraction to the SOI Theory of Learning Abilities as an educator, diagnostician, and administrator emanates from the theory's foundational premise, as postulated by Dr. Mary Meeker (1969, 2000), that intelligence is not simply a fixed, stagnant number, but rather a possibility for further development and enrichment when nurtured within the learning system of the individual. What I perceived as a correlation between this premise and one of my own early life assumptions, that all children are natural learners, further encouraged me to explore the role that the SOI Theory could play in helping students to experience success in school.

As described in Chapter 1, my frustration at the limited academic progress of identified learning disabled students compelled me as an instructional leader to look for a better way to address the individual learning needs of students. This frustration was coupled with the increasing demands of a state assessment system that required that all students meet a designated performance standard. My reaction to these demands was to embrace them as "proof" that all students, with the exception of a very small percentage of profoundly disabled students, could meet these academic challenges. The question was how, especially considering the uneven start of students entering kindergarten.

Children enter kindergarten from a variety of backgrounds, experiences, and personal levels of learning abilities. Many students come to kindergarten with the readiness abilities, skills, and concepts necessary for school learning. When these students attend to the instruction, apply themselves, and study, they will learn. In contrast, some students enter kindergarten with deficits in these readiness abilities, skills, and concepts. Too frequently,

these deficits remain undetected and negatively impact the ongoing learning process, and student failure occurs. It seemed that the SOI Theory of Learning Abilities offered a more individualistic approach to teaching children how to learn and a much less deterministic view of what has come to be referred to as intelligence.

The Meaning of Intelligence

Defining intelligence is not a simple task. Wesman (as cited in Sattler, 1992) stated that "the confusion concerning ways of defining and measuring intelligence is linked to the fact that intelligence is an attribute, not an entity, and that it reflects the summation of the learning experience of the individual" (p. 45).

Spearman (1927) asserts "in truth, 'intelligence' has become a mere vocal sound, a word with so many meanings that finally it has none" (p. 14). Mills (as cited in Spearman, 1927) writes:

> The tendency has always been strong to believe that whatever receives a name must be an entity or being, having an independent existence of its own. And if no real entity answering to the name could be found, men did not for that reason suppose that none existed, but imagined that it was something peculiarly abstruse and mysterious. (p. 14)

Plant (1950) states that "those who are not overawed by the sanctity of intelligence recognize that it fluctuates and that under certain circumstances the margin of error may be quite large" (p. 181). Meeker (1967) made this distinction in the definition of intelligence:

> Intelligence is a manner of functioning in an environment. It allows measurement and forces the notion of differential intelligence. It allows the full impact upon intellectual functioning of emotional, social, cultural, economic, and physiological

> factors and demands. It allows, then, that all of these factors be taken into consideration when an attempt to measure is made by a psychologist. (p. 65)

While the origin of the concept goes back to *intelligentia*, a term introduced by Cicero in (Burt, 1955), Spearman (1927) states that the "monarchic" view of a unitary thing labeled intelligence was accepted as far back as the 15th century. Both Burt and Spearman credit Herbert Spencer (1855) with bringing the term into psychology. After psychologists developed tests to measure intelligence, many theorists attempted to define it.

Snyderman and Rothman (1987) asked experts to rate what they believed were the important elements of intelligence. Experts agreed nearly unanimously (96%) on three of the 13 behavioral descriptors of intelligence: abstract thinking or reasoning, the capacity to acquire knowledge, and problem-solving ability. Sixty to 80% of the respondents agreed on seven of the behavioral descriptors: adaptation to one's environment, creativity, general knowledge, linguistic competence, mathematical competence, memory, and mental speed. Fewer than 25% of the experts agreed on three of the descriptors: achievement motivation, goal-directedness, and sensory acuity.

The authors assert that these results do not provide a precise scientific definition of intelligence (Snyderman & Rothman, 1988). Instead, they draw two conclusions. First, there is a significant amount of disagreement about what the definition of intelligence should encompass. Second, at the same time there is disagreement, there is also agreement among most of the psychologists and educators surveyed that intelligence has to do with abstract thinking or reasoning, problem solving ability, and the capacity to acquire knowledge.

Interestingly, the definitions offered by the experts in Snyderman and Rothman's (1988) survey have similarities to the definitions offered in the 1921 and 1986 symposium on

intelligence. In all, abstract thinking is a common element in the attempt to define *intelligence.* Perhaps, Detterman (as cited in Sternberg & Detterman, 1986) sums it up best:

> Though the definitions provided by this symposium may be more refined, substantial disagreement on a single definition still abounds. It is probably foolish to expect this symposium, or even one held 65 years from now, to come to a unanimous conclusion. A concept as complex as intelligence probably cannot be captured by a single definition without gross oversimplification. (p. 164)

The Origins of Intelligence Testing

The cultural backdrop of the latter part of the 19th century, it seems, was influenced by ideas resulting from Darwin's theory of evolution. The concepts of biological determinism, the survival of the fittest, adaptation, and selective breeding influenced the search for psychological tools that could discriminate between people and predict their ability to survive (Tyler, 1976). Before converting to Darwin's theory of natural selection, British philosopher Herbert Spencer (1855) advanced his own theory of evolution, specifically, that parents passed characteristics obtained through experience to their children through biological heredity. His theory purported that learned behavior, if consistently practiced, could be passed on to future generations as part of their natural makeup.

Spencer's book, *The Principles of Psychology* (1855), written with an evolutionary orientation, is the first psychology textbook to use the word *intelligence* and to note *individual differences* in intelligence. Jensen (1998) explains that Spencer regarded intelligence "as a unitary biological attribute that evolved through the differential alteration of organisms to their environment over time" (p. 6). Spencer taught that behavior evolved in concurrence with the body's physical systems. According to Jensen, Spencer was the first to

view the mind, or particularly intelligence, "as an organically evolved adaptive mechanism used in the competition for survival in a particular environment" (p. 6).

While Spencer introduced Darwin's ideas into psychology, the empirical study of intelligence and individual differences began with Sir Francis Galton, a half- cousin of Charles Darwin (Jensen, 1998; Spearman, 1927). In his book *Hereditary Genius*, Galton (1869) statistically tested the idea that intelligence ran in families. He compiled lists of men recognized as making positive contributions to society. From these lists, Galton discovered that 10% of the people regarded as successful were related to each other and had achieved success in the same area as their relatives. Galton believed that this evidence supported his idea that intelligence is inherited.

In 1883, Galton published *Inquiries into Human Faculty* in which he examined the problems involved in assessing mental characteristics. In 1884, Galton opened a booth, the Anthropometric Laboratory, at the London International Health Exhibition, and charged people three pence to test their physical abilities with 17 devices he produced (Vernon, 1979). Nettlebeck and Wilson (2005) point out Galton's supposition that because our knowledge of the environment reaches us through our senses, intelligence would emerge in the form of sensitivity of perception, and those with the highest intelligence should also have the best sensory discrimination abilities. This assumption led him to develop tests that measured sensory thresholds such as acuity of sight and hearing, sensitivity to skin pressure, and such simple psychomotor tests as reaction to stimuli and strength of handgrip to study mental functioning (Guilford, 1967; Herrnstein & Murray, 1994; Sattler, 1992). He took bodily measures and attempted to correlate size, shape, and ability. He felt especially perplexed by the relationship between head size and intelligence because his head was

smaller than average, yet he had been a child prodigy. Murdoch (2007) suggests that Galton eventually concluded that head size must not be the primary factor but interacted with other factors to determine human intelligence.

Galton hoped that the data he collected in his anthropometric lab would prove that people's successes in life correlated with their performance in his lab. He assumed that genetics, not error, explained why abilities were distributed among the people he evaluated in his lab. He wanted to ascertain with mathematical exactness how people inherited ability. In order to accomplish this task, he had to measure the tendency of variables to be related. He could measure how people performed on the tasks in his lab, but he did not know whether there was any correlation between performing well on the tasks and success in life, or if each of the tasks were correlated to each other. Although in time, Galton's own statistical inventions failed to reveal a correlation between the tests he conducted in his lab and measures of future success, his origination of two important statistical concepts – regression to the mean and correlation - allowed the psychometric field to thrive and develop. These concepts permitted intelligence to be studied over time and allowed for the study of such relationships as that between the intelligence scores of parents and children (Herrnstein & Murray, 1994; Locurto, 1991; Murdoch, 2007; Sattler, 1992, Sternberg, 1982; Tyler, 1976).

Galton tests were criticized as being too simple and too sensory (Anastasi, 1988; Guilford, 1967), reasoning that physiological tests aimed at measuring mental ability were misdirected (Murdoch, 2007). Binet and Henri's 1896 study (as cited in Guilford, 1967) preferred more complex tests and suggested that 10 functions be investigated by means of tests: memory, imagery, imagination, attention, comprehension, suggestibility, aesthetic

appreciation, moral sentiment, muscular force and force of will and motor skill, and judgment of visual space.

In the late 1880s, Binet began studying his two young daughters. He sought to assess their capabilities and differences by measuring their performance on many tasks. When Binet compared his daughters' performances on the tasks to adult performances on the tasks, he ascertained that on simple tasks his daughters performed as well as adults. On tests involving sensory acuity, his daughters outperformed adults, and on tests involving reaction time, they were nearly the same as adults (Guilford, 1967; Murdoch, 2007).

Just after the turn of the century, Binet's interest in testing corresponded with an issue of national concern in France. The French government passed a law requiring that all school-age children attend school. Educators now had the task of educating all children. The government commissioned Binet and Simon, a medical doctor, to find a method for discriminating among children and discerning their potential for future learning (Eysenck, 1998; Eysenck & Kamin, 1981; Guilford, 1967; Murdoch, 2007).

Binet and Simon began by administering hundreds of test questions to school-age children attempting to identify a set of questions that would predict children at risk for school failure. Through these trial tests, Binet and Simon initially struggled. They asked a series of questions to a group of "normally" developing children, and to a group of children identified by teachers and physicians as not developing "normally." Binet and Simon were confused because the performance of the two groups overlapped, which diminished the usefulness of the questions as a diagnostic tool. Eventually, they concluded that the age of the child should be taken into account. Their 1905 scale contained 30 items presented in order of increasing difficulty (Gardner, 1999; Guilford, 1967; Murdoch, 2007; White, 2001). The subsequent

decision to compare mental age with chronological age provided a means for identifying children with developmental difficulties. If a student scored significantly below his or her chronological age on the Binet-Simon test, developmental problems were indicated (Murdoch, 2007).

Binet and Simon also contrived a way to arrive at a numerical result for each student tested. If a student correctly answered all of the questions that a child of his or her age should be able to answer, the child's chronological age was his or her score. If a child answered questions beyond his or her age, he or she received a score corresponding to that age. For example, a seven-year-old answering some questions correctly at the eight-year-old level might receive a score of 7.4 (Hein, 1954; Murdoch, 2007; Perkins, 1995).

Binet was very cautious in the use of numbers, fearing that his tests would appear more precise and scientific than they were (Murdoch, 2007). Quantification was not a priority with Binet. In fact, he never used the term "mental age" but preferred the more qualitative term "mental level" (Tyler, 1976). Binet (as cited in Murdoch, 2007) wrote, "It must be well understood that these fractions in so delicate an appreciation do not merit absolute confidence, because they will vary noticeably from one exam to another" (p. 34).

Binet and Simon's 1908 scale and 1911 scale further refined the process of differentiating among abilities in children. These revisions became the predecessor to the 1916 Stanford-Binet Scale, adapted and translated in the United States by Lewis Terman (White, 2001).

The Stanford-Binet dominated the testing world for many years with revisions in 1937, 1960, 1986, and 1991. The first substantial competitor for the Stanford-Binet was the Wechsler Scales. The initial scale, called the Wechsler-Bellevue Intelligence Scale (WBIS),

contained tests in two factors, verbal and performance. The scale yielded scores in both and a combined score. Each of the two factors contained five or six special factors (Guilford, 1967; White, 2001).

Over time, the test was expanded to three tests: *The Wechsler Intelligence Scale for Children* (1949, revised in 1974 and 1991), *The Wechsler Adult Intelligence Scale (*1955, revised in 1981 and 1997) and *The Wechsler Pre Primary Scale of Intelligence* (1967, 1989, 2002). Wechsler (1958) himself distinguished the measure of intelligence in a very restrictive sense, stating that, "intelligence is the aggregate or global capacity of the individual to act purposely, to think rationally, and to deal effectively with his environment" (p. 7).

The shift from the design of the traditional intelligence test yielding a single, global measure of a person's cognitive ability to a test measuring different abilities occurred as the interest in selective screening for military personnel and other professions increased. In addition, the development of factor-analytic techniques allowed the different abilities to be identified, sorted, and defined.

Factor Analytic Theories of Intelligence

In examining the history of factor analysis, one discovers at least two primary schools of thought: those who supported a general-factor theory (g) of intelligence and those who advocated a multiple-factor theory. Galton first suggested that individuals have both a general intellectual ability, present in the whole scope of their mental abilities, and some special aptitudes. In contrast, theorists such as Thorndike (1927), Thurstone (1938), and Guilford (1967), stressed that the intellect is composed of many independent abilities.

Charles Spearman (1927), an English army officer and student of psychology, introduced the statistical techniques that permitted the testing of these opposing theories.

Prompted by his intrigue with Galton's work, Spearman (1927) noted that if the same group of people took two different mental tests, the results on both tests were similar if the cognitive skills required were similar. Spearman (as cited in Herrnstein & Murray, 1994) argued that if "two items tap into the same trait; they share something in common and positively correlate" (p. 3). In 1904, Spearman proposed a two-factor theory of intelligence to explain the patterns of correlations noticed among tests of intelligence. Spearman labeled the common factor "*g,"* which he purported was manifested in individual differences on all mental tests (Eysenck, 1971; Jensen, 1998). He supposed intelligence to be a general ability factor (g) in combination with a number of specific factors (s). In later research, Spearman recognized group factors. He developed a method for ascertaining the amount of sharing occurring in a given set of data. To corroborate the idea of *g,* Spearman developed a statistical method, now referred to as factor analysis (Eysenck, & Kamin, 1981; Guilford, 1936; Herrnstein & Murray, 1994; White, 2001).

In 1941, Raymond Cattell, a student of Spearman, conceptualized that Spearman's *g* is not a unitary factor but a composite of two different general factors. Cattell (1971) postulated that either of the two different general factors may take prominence, depending on the nature of the tests that are factor analyzed. Cattell replaced Spearman's single *g* with two semi-general factors called *fluid* intelligence and *crystallized* intelligence, now referred to as *Gf* and *Gc* (Jensen, 1998; Nettlebeck& Wilson, 2005; Tusing & Ford, 2004).

Gf represents fluid reasoning or the capacity to solve novel problems. Cattell (1971) defined it as, "the expression of the level of complexity of relationships which an individual

can perceive and act upon when he does not have recourse to answers to such complex issues already stored in memory" (p. 99).

Gc might be described as consolidated knowledge. It reflects academic and cultural knowledge attainment. Cattell (1971) states that "*Gc* arises not only from better educational opportunity but also from a history of persistence and good motivation in applying fluid intelligence to approved areas of learning" (p. 96).

Since the first identification of *Gf* and *Gc,* Cattell and a former student, John Horn, have expanded the model to include the broad abilities of visual processing (*Gv*), short-term apprehension and retrieval (*Gsm*), long-term storage and retrieval (*Glr*), speed of processing (*Gs*), auditory processing (*Ga*), quantitative ability (*Gq*), and reading-writing ability (*Grw*). Thus, the Gf-Gc theory distinguishes 10 broad ability factors (Jensen, 1998; Tusing & Ford, 2004).

Thorndike (1927) theorized intelligence as the outcome of a large number of interrelated but separate learning abilities. Some mental abilities have elements in common and come together to form clusters. Three clusters have been identified from Thorndike's research: social (dealing with people), concrete (dealing with things), and abstract intelligence (dealing with mathematical and verbal symbols).

Thurstone (1938) taught that intelligence could not be regarded as a unitary trait. Using the centroid method of factor analysis, he identified the following factors as primary mental abilities (PMA): verbal, perceptual speed, inductive reasoning, number, rote memory, deductive reasoning, word fluency, and space or visualization. He believed that intelligence can be divided into these multiple factors.

SI Theory

In the early 1950s, J. P. Guilford, a psychologist and statistician, published the Structure of the Intellect (SI) Theory describing the operation of the human mind. Guilford insisted on the existence of a large number of independent intellectual abilities.

The history of the Structure of the Intellect (SI) Theory began during World War II. The Army Air Corps was training pilots, navigators, and bombardiers. The need for trained personnel was critical. The Air Corps used three measures for personnel selection: good health, especially vision; the ability to operate under stress; and high intelligence. All of the flight school cadets met these qualifications, but one out of three was not successfully completing the program (Guilford, 1971; R. Meeker, 1996).

The Air Corps contracted Dr. J. P. Guilford to ascertain why the failure rate was so high given the criteria used for selection. After Guilford composed a set of job descriptions for pilots, navigators, and bombardiers, he derived a compilation of the intellectual functions required for each job and developed tests that identified and measured the necessary abilities. Guilford administered the test to the candidates who had successfully completed the training and those who had not. He analyzed the results to determine which items discriminated between the two groups. He threw out the items that did not discriminate and, in doing so, was able to preserve only the best items for selection. The result was a decrease in the failure rate from 35% to 5% (Guilford, 1971; R. Meeker, 1996).

Guilford (1967) used factor analysis to identify those abilities or intelligence factors required for Air Corps training. He replaced a general intelligence measure (a single molar measure of intelligence) with a differentiated measure of intellectual abilities (the knowledge and the range of individual abilities that make up intelligence). This innovation was the

initial step toward the development of the Structure of the Intellect (SI). The impressive results led the Defense Department to fund Guilford's work for the next 20 years (1945-1965) in the Aptitudes Project at the University of Southern California. During this time, Guilford and his students conducted some 40 factor analyses identifying many different intellectual abilities or aptitudes (Guilford, 1985; Guilford & Hoepfner, 1971; R. Meeker, 1996).

Guilford (1967, 1971, and 1985) influenced the world with his theory that the intellect is multidimensional. He proposed that intelligence is not a single factor (g) or several factors (primary mental abilities), but contains 120 or more factors. Some consider the SI Model as the culmination of the work of such theorists as Thorndike (1927), Thurstone (1938) and Cattell (1941), who defended a differentiated intelligence concept.

Critics of Guilford's SI Model claim that it "is supported only by a type of factor analysis that mathematically forces a large number of narrow factors to be uncorrelated, even though all the different ability tests that are entered into the analysis are correlated with one another" (Jensen, 1998, p. 105). These opponents charge that "evidence does not support Guilford's assertion of zero correlations among ability tests; the few zero and negative correlations that Guilford found are due to sampling error and to other statistical limitations" (p. 105). Some have contended that Guilford has simply created a framework of subjective, philosophical-logical categories on current data indications according to his own chosen logic. Even critics of Guilford's SI Model acknowledge that his three dimensional approach has been an important first step in encouraging interest in a classification of abilities (Cattell, 1971; Eysenck, 1979; Fancher, 1985).

Guilford (1985) stated, "the nature of the Structure of the Intellect (SI) model suggests that intelligence should be defined as a systematic collection of abilities . . . for processing information of different kinds in various forms" (p. 231). He explains that the term "ability" is used in the context of individual differences. Every intellectual ability in the structure is differentiated according to the type of operation employed, the contents involved, and the type of product resulting (Anastasi, 1988; Guilford, 1967; M. Meeker, 1969). There are five operations, which can take on any one of four contents, at six different levels of complexity (5 X 4 X 6 = 120).

Figure 1 is a three-dimensional classification display of the 120 predicted categories of intellectual components (M. Meeker, 1969). Each factor has a three-letter designation. The first letter refers to the operation, the second to the content, and the third to the product (M. Meeker, 1969, 2001). One example of a SOI ability in Figure 1 is represented by the three-letter symbol CFU (cognition of figural units) which means the ability to scan horizontally. When applied to learning, CFU is "the visual requisite for reading and closing letters into words that are meaningful" (R. Meeker, 1996, p. 50). Another example, not specifically denoted on Figure 1, would be CFT (comprehension of figural transformations) defined as "the ability to see space perspectives" (R. Meeker, 1996, p. 50). CFT is applied to learning in geometry and algebra. Appendix C provides a list of the additional SOI learning abilities and definitions.

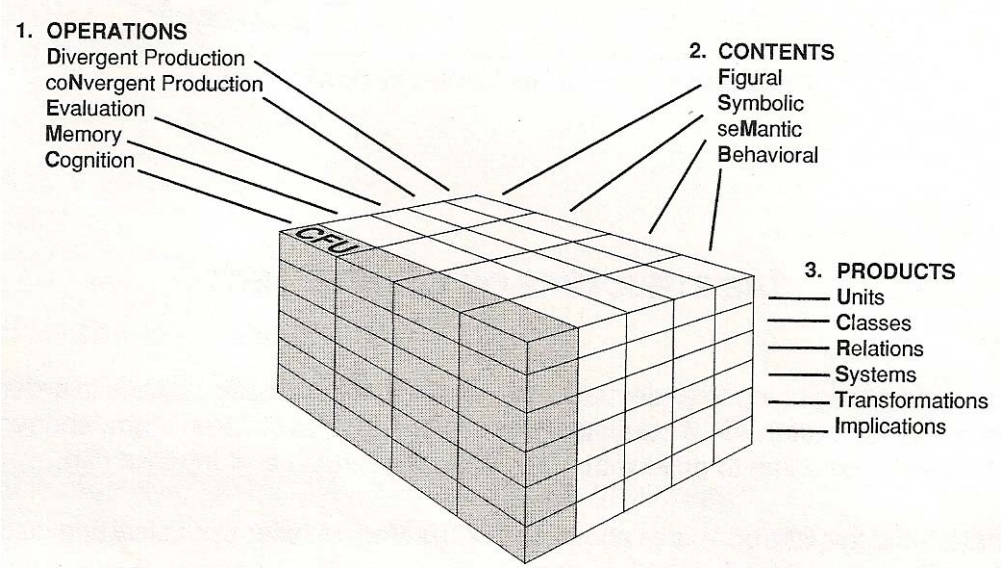

Figure 1. Structure of the Intellect Model

Note: From *A Beginner's Reader About J. P. Guilford's Structure of Intellect (p. 2),* by M. N. Meeker, 2001, Vida, OR: SOI Systems. Copyright 1963, 2001 by Mary Meeker. Reprinted with permission of Robert Meeker.

Operations. The first dimension of the Structure of the Intellect Model is intellectual operations. Intellectual operations are comprised of cognition, memory, evaluation, convergent production, and divergent production (M. Meeker, 1969; R. Meeker, 1996).

Cognition is the ability to assimilate new material or to recognize previously encountered material. Educators often use the word "comprehension" to convey what SOI considers cognition. Some students understand the material the first time it is presented. In contrast, other students require that the material be presented many times in different ways in order for comprehension to take place (M. Meeker, 1969; R. Meeker, 1996).

Memory operation has been defined as "the retention or storage, with some degree of availability, of information in the same form in which it was committed to storage and in connection with the same cues with which it was learned" (Guilford, 1967, p. 211). Memory is the ability to recall information that has been previously cognized (R. Meeker, 1996), with some degree of availability when that information is needed (M. Meeker, 2001). While

cognition is the ability to take in information, memory is the ability to bring the information back to consciousness as needed. Teaching spelling words Monday through Thursday and expecting students to produce the correct spelling of those words on Friday is an example of memory in school.

Evaluation is the ability to make viable decisions or judgments (R. Meeker, 1996). SOI considers evaluation skills to be synonymous with what people often refer to as "common sense." It is "the art of making decisions, judgments, critical analysis, and prioritizing, and implies an awareness of error or discrepancy requiring judgment in relation to a known or understood standard" (M. Meeker, 2001, p.5). Schools rarely teach evaluation because it requires an uncertain response. Schools normally prioritize clear-cut answers.

Convergent production "is the generation of information from given information, with the emphasis being placed on achieving the generally accepted best answer." It is "the production of the correct answer where the 'solution' is more than just retrieval" (M. Meeker, 2001, p. 6). Convergence is regarded as a higher order intellectual ability used in rule-following and problem-solving (R. Meeker, 1996), and is too often taught before cognition, memory, and evaluation (M. Meeker, 2001). In convergent production the elements of the problem are given and the student converges on the answer. Schools depend on convergent production abilities in arithmetic, math, science, and much of language arts.

Divergent production is in contrast with convergent production (R. Meeker, 1996). One converges on the answer with the latter, and one creates (constructs, elaborates) answers within the boundaries of the problem with the former (R. Meeker, 1996). It is "the difference between zeroing in and expanding out" (M. Meeker, 2001, p. 7). The comparison appears similar to distinctions between deductive and inductive reasoning. Divergent production

could be defined as creativity. In school, we can train students to look beyond the usual and common solutions to problems and challenge them to think transformationally.

Contents. The second dimension of the SI model is contents and is differentiated by four subclasses − figural, symbolic, semantic, and behavioral. Below is a brief explanation of each of these four types.

Figural intelligence comprises concrete information that one can see, hear, and touch. One immediately perceives the content information. Figural implies some measure of structure (Guilford, 1967). Figural content is distinguished by the concrete and representational quality of the information. This distinction is akin to Piaget's concrete developmental stage and the Montessori Method of beginning a new learning task with manipulatives. Although most young children are figural thinkers, schools do not normally teach reading as a figural task. In a figural reading program, picture-characters or glyphs represent words. Children who are primarily figural learners often become nonreaders and are labeled learning disabled. Boys tend to be more figurally developed than girls (M. Meeker, 1969; R. Meeker, 1996).

Symbolic intelligence is made up of abstract information in notational form. Concepts have been abstracted to be represented by notations such as numbers, codes, letters, etc. Schools are most concerned with alphabetic and numeric notational systems. Symbolic systems are conventions usually established through usage, such as the rules for spelling. Young children who are symbolic thinkers usually learn phonics easily. In contrast, a child who is not a symbolic thinker will have great difficulty learning to read through phonetics alone (M. Meeker, 1969; R. Meeker, 1996).

Semantic intelligence is made up of concepts and ideas. Semantic content is the basis of school learning and almost all school instruction is expressed in semantic terms. Semantic abilities include concept recognition, understanding verbal relations, comprehension of extended verbal information, and concept discrimination, to name a few (Guilford, 1967; M. Meeker, 1969, 2001). Children with well developed semantic abilities learn to read best from a whole language approach. Educators often assume that young children come to school with all of these semantic abilities in place. Unfortunately, this assumption does not always hold up, and often leads to the belief that a student is learning disabled (R. Meeker, 1996).

Behavioral content is information understood without verbal cues such as an awareness of another person's perceptions, thoughts, desires, feelings, intentions, and actions (Guilford, 1967; M. Meeker, 1969). Guilford added this kind of content to the model to address the kind of information involved in cognition and in other operations relating to the behavior of other people. Even with research, only a few behavioral abilities have been identified and factored within the SI model (M. Meeker, 1969, 2001).

Products. The third dimension of the Structure of the Intellect Model is intellectual products. The term "product" refers to the manner or form in which any information occurs and is synonymous with the term "conception" (Guilford, 1967). The products Guilford identified are: units, classes, relations, systems, transformations, and implications (R. Meeker, 1996). One should note that the products dimension implies a hierarchy, for in a sense each subsumes to the preceding one (Guilford, 1967; M. Meeker, 2001).

Units are defined as single, separate pieces of information (R. Meeker, 1996). The unit is the simplest way in which one can organize information; a unit is one of a kind, such

as one figure, one symbol, a single word or idea (M. Meeker, 2001). Units represent the simplest of the various levels of complexity (R. Meeker, 1996) and are often things to which nouns apply (Guilford, 1967). Young children are units thinkers, seeing the world and their names as things. Detail-oriented persons have strong units' intelligence, seeing details that others may overlook (R. Meeker, 1996).

Classes represent the next level of complexity. Guilford defines classes as "recognized sets of items or information, grouped by virtue of common properties" (Guilford, 1967, p. 80). Classification requires that one understands similarities and differences such that similar things go together, while dissimilar things do not go together (R. Meeker, 1996). Classifications follow and are made up of units (M. Meeker, 2001). Classification is the basis of scientific concepts and is necessary for organization. Children deprived of early literacy experiences often enter school without the ability to classify (M. Meeker, 1969, 2001).

The third level of complexity is relations. A "relation" refers to a type of connection between two things, a kind of connecting link or bridge having its own character (Guilford, 1967). This level can include relations between figures, or between symbols as in deciphering a code, or relations between words or ideas (semantics) (M. Meeker, 1969). Analogies are particularly powerful tools in developing relational abilities. For instance, "a glove is to a hand, as a shoe is to a _____" is a type of double-relation often useful in exploring new areas. The learner draws a relationship in a known area and applies it to an area he or she is trying to understand (R. Meeker, 1996). Units and classes are subsumed in relational thinking. Many children, who have not yet developed units and classification

abilities, often do poorly on analogical questions (M. Meeker, 2001) and, therefore, under-perform on IQ tests, which are almost exclusively relationship tests (M. Meeker, 1969).

Systems is the fourth level of complexity. Systems have been described as "relations of relations or as a sequence of relations" (R. Meeker, 1996, p. 25). Stated another way, systems are complexes, patterns, or organizations of interdependent or interacting parts (Guilford, 1967). A system can be mathematical, such as arithmetic, or composed of numbers written as words where the learner must comprehend the idea of a sequence of arithmetic operations necessary for solving the problem. Linguistics in sentence building can also be a system in that it involves understanding the structure of language with verbs, nouns, etc., and would represent a semantic system (M. Meeker, 1969).

The fifth level, transformational thinking is the capacity to see or "use something in a different perspective" (R. Meeker, 1996, p. 26). Considered one of the highest forms of critical thinking, it is the basis of the inventive process (R. Meeker, 1996). Transformations are changes, revisions, redefinitions, or modifications of original material into new information or stated differently, changing material from one state into another state (Guilford, 1967; M. Meeker, 2001). Unfortunately, children receive very few opportunities at this level of functioning in school. Instead, students are expected to learn information in the way it is presented and are often redirected if their presentation of the material varies. Puzzles, paper folding, and spatial visualization tasks are examples of transformations in figural content. A clever ending to a story is an example of a semantic transformation especially, if the ending transforms the original meaning of the story (M. Meeker, 1969).

The final level of complexity is implications, or the capability to perceive the result or "consequences of an action, conceptual position, or a line of argument" (R. Meeker, 1996, p.

27). Teaching implications is challenging. For the student who readily sees cause and effect, generalizing to unlike situations is not difficult. For the literally minded student, implications must be taught (M. Meeker, 1969). Implications are not simply that "one thing follows another but that the two have an intimate way of being connected" (Guilford, 1967, p. 64). An example of implication thinking in figural content is running a maze or making a meaningful drawing out of squiggly lines (M. Meeker, 1969; R. Meeker, 1996). In the semantic realm, implications are used in all forms of debate, analysis of text, litigation, and decision making. Debugging a computer is an example of implication thinking in a symbolic product (R. Meeker, 1996).

The Application of the SI Model to Education (SOI)

Meeker (1969), a doctoral student of Guilford's, realized the potential of the Structure of the Intellect (SI) Model for educators in diagnosing learning difficulties in students. She believed that it was incomplete to identify the kinds of abilities students need for functioning intellectually without providing the experiences students needed to develop those abilities. To say it another way, the application of intelligence depends on the growth of these abilities. Meeker asserted that "Teaching the ability to learn should be considered as equally important a goal as is mastery of prescribed content" (p. 4).

Meeker (1969) considered the SI Model as a way of processing information for the purpose of assessing which areas educators need to teach and then applying that knowledge to the teaching process. Meeker's application of the SI Model to education is called Structure of the Intellect (SOI). She began this application to education by developing templates that translated the protocols of the Stanford-Binet and the Wechsler Intelligence Scale for Children (WISC) into Structure of the Intellect terms. Meeker believed that typical

IQ tests that yielded global scores did not provide the teacher insight about how to help the student. In contrast, this translation would make available a profile of the student's strengths and weaknesses supplying classroom teachers with information related to how their teaching could meet the varied needs of students (M. Meeker, 1969). The SOI profiles supply teachers with knowledge about their students that they can use in curriculum planning and assessment Appendices D, E, and F provide additional information about the relationship of the Structure of the Intellect to curriculum.

Through Dr. Meeker's continued research from 1962 to 1974, she mapped the different kinds of intellectual abilities. She established that certain intellectual abilities were closely related to learning reading, arithmetic, higher math, and creativity and that students can develop these abilities. Meeker correlated student failure with the absence of the necessary learning abilities. Meeker's adaptation of the Structure of the Intellect Model for education proposes that students can develop intellectual abilities, like physical abilities, through cognitive and perceptual exercises. When educators attempt to remediate content inadequacies, their attempts are likely ineffective if students do not have the required skills for learning the content of the curriculum (M. Meeker, 2000; R. Meeker, 1996).

Meeker's belief that students can improve abilities neglected, ignored, or inhibited by factors such as poor health, perceptual problems, or emotional barriers, prompted her subsequent development of the SOI-Learning Abilities Test based on the SI Model of human intelligence. The test is composed of 26 subtests that measure the 24 abilities that relate to basic learning. A detailed explanation of the SOI abilities related to reading readiness, conceptual reading, arithmetic, mathematics, and creativity are in Tables 1-5.

Educators analyze and interpret the results of SOI-Learning Abilities Test with regards to the learning problems that students present. The interpretation yields an educational diagnosis which provides the information for a prescriptive treatment plan. Students develop the learning abilities through a sequence of very concentrated training exercises. SOI rectifies the student's learning deficits by teaching through the student's strengths. Each student has his or her own training plan according to his or her individual needs. Once developed, these learning abilities become the tools and foundation for mastering learning tasks throughout life (R. Meeker, 1996). Meeker emphasized that, "The key to understanding a child's intelligence is not how much, but what kind" (M. Meeker, 2000, p. 66).

Table 1

SOI Abilities Related to Reading Readiness

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
CFU – Cognition of Figural Units	Visual closure	Will not see complete word from first letter to last. Misreads "saw" and "was."
CFC – Cognition of Figural Classes	Visual Conceptualization	Poor concept formation; low reading comprehension. Comprehends single stimulus, but has problems classifying and conceptualizing.
EFU – Evaluation of Figural Units	Visual Discrimination	Mistakes b, d, and p, q: Misreads inside letters. Omits small words in sentences. Misreads endings or beginnings.

Table 1 (*continued*).

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
EFC – Evaluation of Figural Classes	Judging similarity of concepts	Poor concept formation; low reading comprehension. Cannot conceptualize similarities and differences in meanings.
MSU-Memory for Symbolic Units (visual)	Visual attending	Problems with spelling; recognition of new words. Forgets where things are. Has a problem with vision span.
MSS – Memory for Symbolic Systems (visual)	Visual sequencing	Cannot hold information in mind while "processing" it at the same time. Problems in recalling long words or sequences. Has difficulty concentrating.

Note: From *The Structure of the Intellect and the SOI: Inservice Manual* (p. 33), by R. J. Meeker, 1996, Vida, OR: M&M Systems. Copyright 1980, 2002 by Mary Meeker, Robert Meeker. Adapted and reprinted with permission of Robert Meeker.

In Table 1, six different SOI abilities have been identified as especially related to reading readiness. It is worth noting that none of these abilities involve semantics – they are all in the figural and symbolic content areas. In that sense, they are all precursors to reading-abilities that should be developed before reading instruction begins (R. Meeker, 1996).

In Table 2, in addition to the six abilities related to reading readiness, six other SOI abilities have been identified as especially related to conceptual reading. If any of these abilities is low, and the student is a poor reader, a slow reader, or an uneasy reader, it would be a potential target for remedial programs (R. Meeker, 1996).

Table 2

SOI Abilities Related to Conceptual Reading

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
CMU-R-Cognition of seMantic Units	Vocabulary	Guesses at meanings of words.
		Poor at math "word" problems.
CMR-Cognition of seMantic Relations	Comprehension of verbal relations	Poor reading comprehension of relationship of ideas.
		Poor at math "word" problems.
		Poor at analogies.
CMS-Cognition of seMantic Systems	Comprehension of extended information	Inability to "track" long or involved sentences.
		Often misunderstands instructions.
		Inattentive during lectures.
		Poor comprehension with complex reading material.
		Asks frequently for repeated instructions.
MFU-Memory for Figural Units	Visual memory for details	Often poor in multiple-choice reading comprehension tests (which depend on memory for details.)
		Misses details even if general comprehension is good.
		Poor speller.
MMI-Memory of seMantic Implications	SeMantic and verbal memory	Difficulty seeing connections in reading material.
NST-CoNvergent Production of Symbolic Transformations	Speed of word recognition	Loses place while reading.
		Skips lines while reading or skips words.
		In some cases can read upside down or backwards, but not well otherwise.

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Table 3

SOI Abilities Related to Arithmetic

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
CSS-Cognition of Symbolic Systems	Comprehension of numerical progressions	Poor mastery of basic arithmetic facts.
ESS-Evaluation of Symbolic Systems	Selecting correct numerical processes	Difficulty in making decisions about numerical processes.
NSS-CoNvergent Production of Symbolic Systems	Application of numerical facts	Difficulty with arithmetic problem-solving.
MSU-Memory for Symbolic Units (auditory)	Auditory attending and concentration	Forgets verbal instructions. Inattentive in lectures.
MSS-Memory for Symbolic Systems (auditory)	Auditory sequencing	Cannot hold material, presented auditorially, in mind while processing.
ESC-Evaluation of Symbolic Classes	Conceptualizing arithmetic processes	Difficulty with "thought" problems involving different numerical concepts. Difficulty understanding and using "set" concepts.

Note: From *The Structure of the Intellect and the SOI: Inservice Manual* (p. 35), by R. J. Meeker, 1996, Vida, OR: M&M Systems. Copyright 1980, 2002 by Mary Meeker, Robert Meeker. Adapted and reprinted with permission of Robert Meeker.

In Table 3, six SOI abilities are identified as especially related to arithmetic; five other SOI abilities are identified as related to arithmetic, but more especially related to mathematics. The six abilities described in Table 3 are all especially related to arithmetic learning; the five abilities that are described in Table 4 are particularly related to mathematics. The contrast between these two sets of abilities is often reflected in students who do well in arithmetic, but not in mathematics; this difference in performance is often paralleled by a difference in these sets of abilities; i.e., many students (especially females)

have the abilities described in Table 3 – and do well in arithmetic – but do not have the abilities described in Table 4 related to mathematics (R. Meeker, 1996).

Table 4

SOI Abilities Related to Mathematics

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
CFS-Cognition of Figural Systems	Constancy of Objects in space (Piaget)	Difficulty "seeing" interrelations, especially spatial.
CFT-Cognition of Figural Transformations	Spatial conservation (Piaget)	Difficulty "seeing" things in different perspective, especially figures in space.
CSR-Cognition of Symbolic Relations	Comprehension of abstract relations	Difficulty holding in mind unconnected facts until they are needed for solution-the facts are unconnected until the implication is made.
NSI-CoNvergent Production of Symbolic Implications	Form reasoning and logic	Difficulty with "thought" problems. Difficulty with introduction of new relations in system.
CMU-M-Cognition of semantic Units (Math)	Math vocabulary	Difficulty in relating math concepts.

Note: From *The Structure of the Intellect and the SOI: Inservice Manual* (p. 36), by R. J. Meeker, 1996, Vida, OR: M&M Systems. Copyright 1980, 2002 by Mary Meeker, Robert Meeker. Adapted and reprinted with permission of Robert Meeker.

In Table 5, three of the SOI abilities tested on SOI-LA—Form CR are related to creativity. These subject tests cover three different content areas—figural, symbolic, and semantic. Each of these is described in Table 5 (R. Meeker, 1996).

Table 5

SOI Abilities Related to Creativity

Structure of Intellect Ability	Learning Skill Definition	Behavioral Consequences of Ability Weakness
DFU-Divergent Production of Figural Units	Creativity with things	Lack of ideational fluency. Inability to undertake a task without explicit directions.
DSR-Divergent Production of Symbolic Relations	Creativity with math facts	Likes "cookbook" aspect of math. Difficulty assimilating new math concepts. Timid in exploring the consequences in programming exercises.
DMU-Divergent Production of semantic Units	Creativity with words and ideas	Slow in composing essays or stories. Lacks sense of humor. Sterile writing, pedantic reporting.

Note: From *The Structure of the Intellect and the SOI: Inservice Manual* (p. 36), by R. J. Meeker, 1996, Vida, OR: M&M Systems. Copyright 1980, 2002 by Mary Meeker, Robert Meeker. Adapted and reprinted with permission of Robert Meeker.

Works by others have sought to verify the identification of and value of training SOI abilities in children. Following are some of the studies conducted for these purposes.

Hess (1972) in Meeker (n.d.) used four classes of first graders to test the value of training SOI abilities. Two classes were control groups and received the typical first grade reading program. Two classes were not taught reading, but received training in identified weak SOI learning abilities. At the end of the four and a half month study, the control group showed no gains on the reading test. The experimental group made significantly better scores at the 5% level.

The Fidalgo Project (1994) was sponsored by a six year grant under the *Schools for the Twenty-First Century* program. The SOI Model was one of the primary components of the integrated learning system used at Fidalgo Elementary School. Some of the project outcomes include the following: an average increase in WISC-R full scale IQ scores of 16 points per student; an 18.69 percentile gain in reading comprehension as measured by the Gates Reading Comprehension Tests in four classes of fifth grade students receiving instruction according to the SOI Tests of Learning Abilities results; an impressive gain in speed of reading mean; and significant gains on SOI Test of Divergent Thinking and Creativity.

The Besel Study (1980) sought to improve SOI Abilities in fifth graders through SOI Training. Pre- and post- test measures on the SOI Tests of Learning Abilities showed an increase of 1.75 grade levels after 9 months of instruction on the abilities given high priority. The abilities given low priority and the abilities not formally taught showed an increase of 1.75 grade levels and .875 grade levels, respectively.

The purpose of the Blazey Study was to determine if SOI training is an effective way to improve intelligence in educationally mentally handicapped students (Blazey & Mead, 1972). Thirty-nine percent of the children (n=13) increased their IQ as measured by the Stanford-Binet (Form L-M) by more than one standard error after four months of SOI training specific to his or her weaknesses.

The Digit Study sought to show that SOI training in arithmetic-related SOI abilities leads to improved performance on standardized achievement tests (Coker, 1979). Students were administered pre- and post- tests on the Stanford Achievement Tests. After the first year, the kindergarten students increased from the 50^{th} percentile on the arithmetic portion of

the SAT to the 87th percentile. After the second year, second through sixth grade students improved on the arithmetic portion of the SAT from the 50th to the 85th percentile. The students received fifteen minutes daily of SOI instruction.

The purpose of the Cagle Study was to ascertain if educationally disabled students can improve memory through specific training (Cagle, 1973). Pre-and post- tests on the Stanford-Binet and the Wide Range Achievement Test were given to the control and experimental groups. The experimental group received 20 minutes per day of memory training for 2½ months. The researchers used analysis of variance to examine the data. At the end of the study, the students in the experimental group had improved significantly more that the students in the control group in Cognition, Memory, Relations, and Units ($p. < .05$), and in Evaluation and Systems ($p. < .01$) and in Figural and Semantic Intelligence and IQ score ($p.< .10$).

The premise that intellectual functions can be trained is the core of the SOI Model. These case studies and others demonstrate that abilities as defined by the SOI model can be developed with appropriate exercises. Interestingly, education as an aptitude development program dates to first century Rome, as evidenced by the five themes for teachers offered by Quintilian (Detterman & Sternberg, 1982):

1. Identify apparent aptitudes and inaptitudes for each learner.
2. Help to develop aptitudes by differentiating courses of instruction, allowing individual educational goals. Guide learners in choosing courses according to their aptitudes.
3. Within a course of instruction toward a common goal, seek to develop all relevant aptitudes even if some are weak at the start; adapt alternative instructional

treatments to the individual's aptitude pattern, so as to remove defects, and to build up strengths where they are lacking.

4. Use the individual's strengths to work on the weaknesses. Teaching that runs counter to an individual's aptitude may actually weaken those aptitudes.
5. Even if, below a certain level of general intelligence, little can be done other than to choose goals in keeping with special aptitudes, above that general level, appropriately adapted instruction can bring initially weak aptitudes up, to equal their prior strengths. (pp. 8-9)

The best way to conclude this chapter may be to discuss what I have gained from researching the concept of intelligence. Intelligence, it would seem, is an artificial construct designed to objectively measure the observed phenomena more commonly called "a person's ability to learn." Many researchers have sought to discover whether intelligence (ability to learn) is fixed or if students increase intelligence with the appropriate strategies and experiences. When this journey began, I hoped to emerge with an answer to this question. It seems that myriad theories have a measure of plausibility, but none is proven. We can speculate about the effects our parents, education, and culture have on individual abilities. We can presume that given different experiences we would have different abilities. What I have realized from this process of study is that the question I was asking about intelligence did not convey the meaning I was really seeking. Despite asking the question, hundreds of years later, society still acts as if children should achieve at the same rate. I have learned that children are often labeled as a way of defining them and of dismissing our own responsibility in their learning and development. While our experiences influence our individual abilities, they also influence the value and priority we assign to our abilities and to those of others.

Oliver (as cited in Wolman, 1985) offered this insight into the attempt to measure intelligence:

> Anyone who thinks that a test score reflects all of the needed educational information or reflects all aspects of human talent or is an indication of human worth or value, does not understand the nature of testing. Tests simply provide some information that, when properly used, is extremely valuable in making better educational decisions. (p. 934)

In summary, this chapter has sought to review the literature regarding the difficulty of defining intelligence, the origins of intelligence testing, and the factor analytic theories of intelligence. In addition, a detailed explanation of one of the factor analytic theories of intelligence, Guilford's Structure of the Intellect (SI) Model, was provided. The explanation of the SI Model was followed by an evaluation of Meeker's application of the SI Model to the education system (SOI) and ended with some conclusions drawn from the research. The next chapter tells the story of a district's pilot year with SOI Certified Learning Kindergarten.

CHAPTER 3

The Study: Respecting the Individual Child's Learning System

"Originality does not consist in saying what no one has ever said before, but in saying exactly what you think yourself" James Stephens (King, 2008, p. 6).

The SOI Theory of Learning Abilities assumes that intelligence can be taught, abilities can be developed, and readiness for learning can be enhanced (M. Meeker, 2000). SOI Certified Learning Kindergarten (CLK) identifies the entering student's deficits in skills, abilities, and concepts and customizes the curriculum to address the deficits (R. Meeker, 2007). This study explores the impact of this alternative by asking the question: What impact, if any, does SOI Certified Learning Kindergarten have on the academic development of kindergarten students? Stated another way, this study explores the effects on early academic development of respecting the kindergarten students' individual learning systems. The purpose of the study is:

1. To evaluate the impact of Certified Learning Kindergarten on the academic development of those students who have completed the program.

2. To compare the reading readiness of five kindergarten classes using the Certified Learning Kindergarten curriculum to the reading readiness of the 16 kindergarten classes using the traditional TEKS-based curriculum established by the district.

CLK is a kindergarten curriculum constructed from the Structure of the Intellect (SOI) Model, being implemented for the first time in a district. Dr. Bob Meeker designed CLK as an application of Total Quality Management (TQM) to education. Meeker (2007, February) describes the following advantages of this application:

> First, TQM does not tolerate continuing errors, so no instructional failure will go undetected or will be accepted – all students are expected to master every step leading to mastery of the educational standards for their grade levels. Success is guaranteed for every student, so in a literal sense, no child will be left behind.
>
> Second, TQM is a complete system. Wherever and whenever failures occur, the system has procedures for correcting them. In this way, the system is self-correcting and is constantly improving. The system improves week-to-week, so everyone – students, teachers, and administrators – benefit immediately from the improvements.
>
> Third, the system offers new standards of evaluation at all levels. The evaluations are directly related to the instructional process. The emphasis in evaluation is not on testing; it is on measured success. The result of not passing a test is not a label of failure, but a prompt to find a way to master the material being tested. (pp. 1, 3)

Methodology

Description of the Program

CLK has three different modes of instruction – group-oriented instruction, independent workbook instruction, and individual computer instruction. The students complete the CLK instructional modes in the morning half of the full day kindergarten program. Five instructional periods of 20 minutes each make up the schedule. Over the course of the five instructional periods, the students can receive more than one session in an instructional mode or the teacher may add a literacy center, play center, or other center activity to the morning rotation. Although the CLK Software Management System assigns the students' daily schedules, the teacher has the option of changing the assignments at the beginning of each day (R. Meeker, 2007).

The curriculum is organized into units distributed across 32 weeks of instruction (See Figure 2).

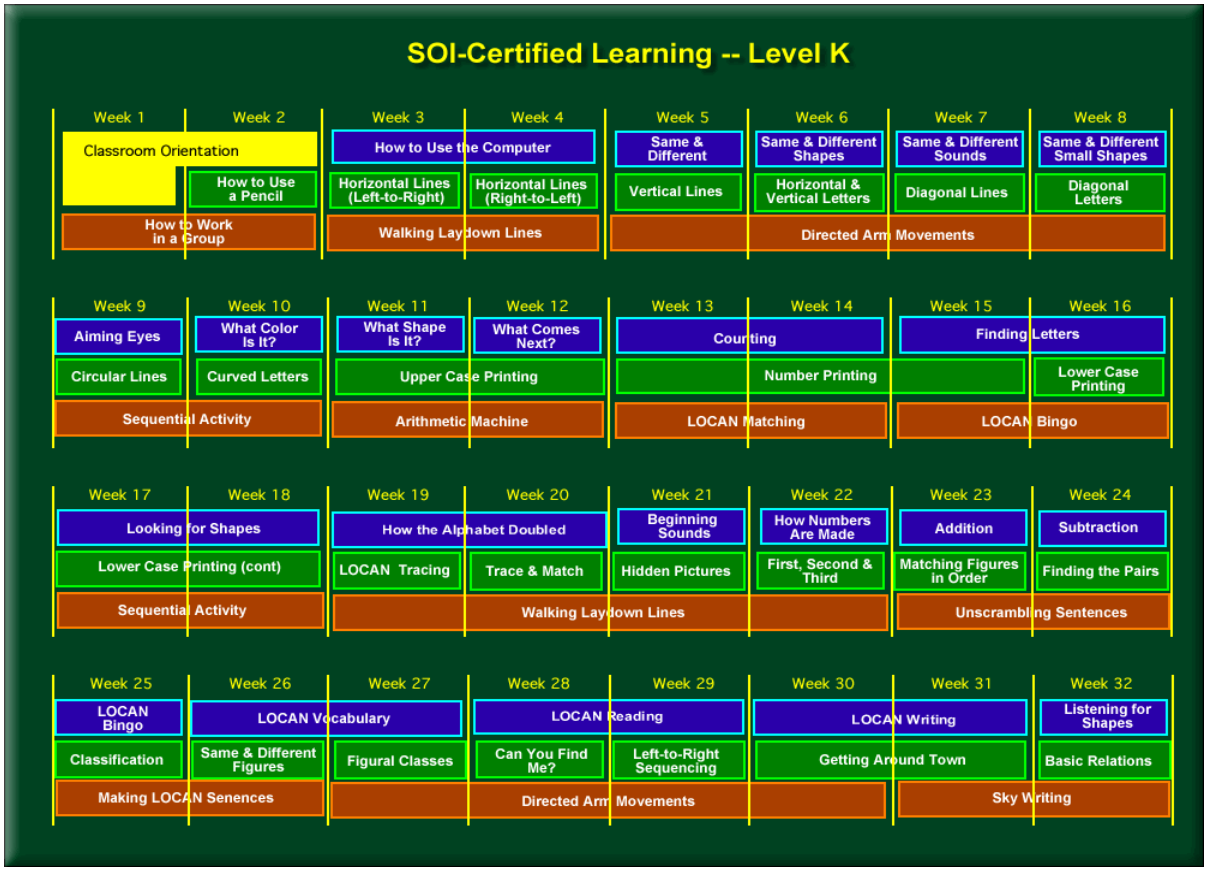

Figure 2. Certified Learning – Kindergarten Curriculum Organization

Note: From SOI Certified Learning [Computer software], by R. J. Meeker, 2007, Vida, OR: Goodpasture Productions. Copyright 2007 by Robert Meeker. Adapted and reprinted with permission of the author.

Each unit teaches an instructional objective, perceptual skill, or SOI learning ability (R. Meeker, personal communication, May 8, 2008). The overall goal of CLK is for all students to meet state standards, i.e., to master the Texas Essential Knowledge and Skills (TEKS) for kindergarten.

Before kindergarten students can master the core competencies of the TEKS, they must have the enabling skills to learn. The presence of the enabling skills allows the students

to learn the core competencies directly. The first enabling skill or intermediate objective needed for students to master the core competencies of the TEKS is *understanding sequencing* (light blue box). The light blue lines indicate the core competencies that require the understanding of sequencing. All of these curriculum units (designated in the blue, green, and orange boxes) contribute to the understanding of sequencing (Figure 3). The blue boxes represent the curriculum units taught through computer instruction and the green and orange boxes represent curriculum units taught through workbook and group instruction, respectively (R. Meeker, 2007; R. Meeker, personal communication, May 8, 2008).

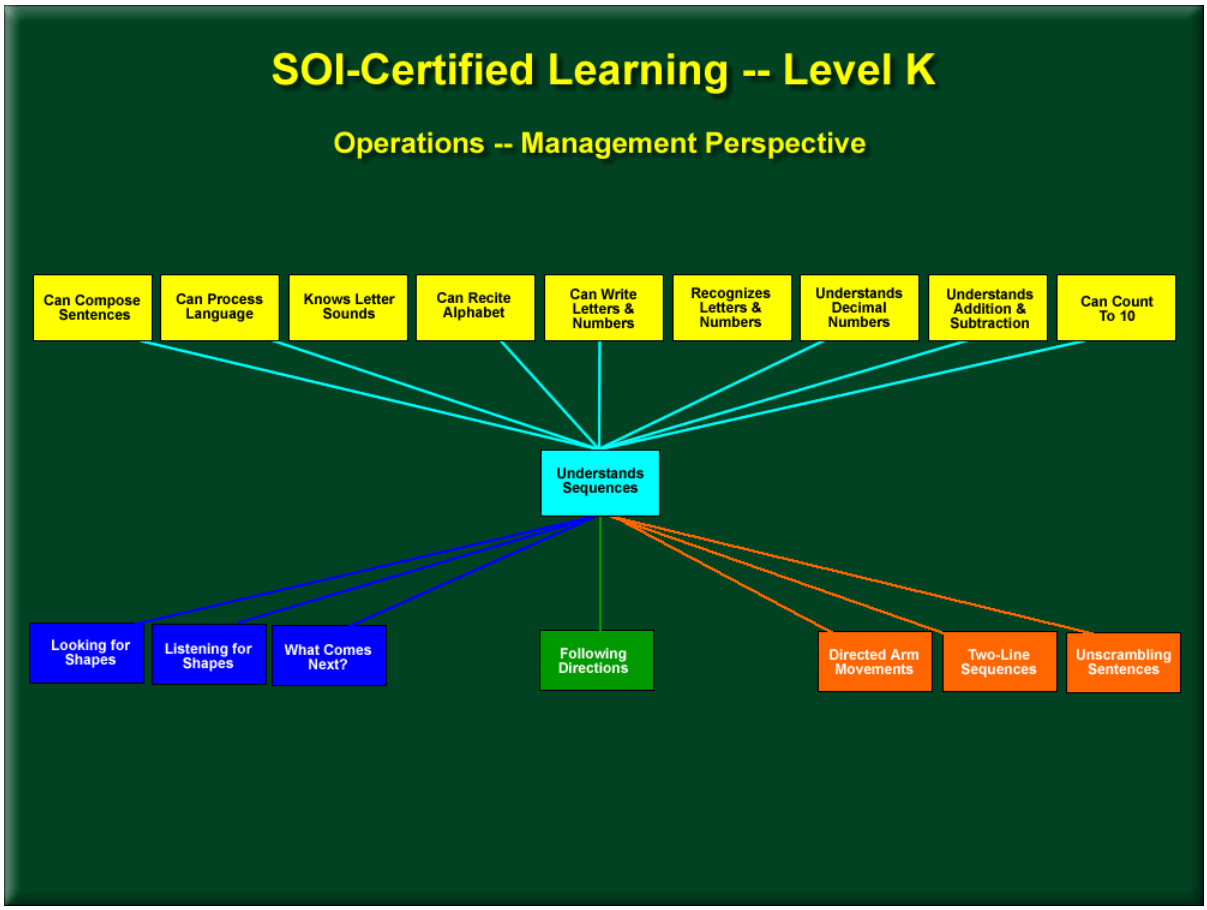

Figure 3. Certified Learning – Kindergarten: Understands Sequences

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A second intermediate objective, or enabling skill, that students need is *memory skills* (See light blue box in Figure 4). All of the units in the blue, green, and orange boxes contribute to the development of memory abilities. Some of the units that teach sequencing are also used to teach memory skills. The blue boxes represent the curriculum units taught through computer instruction and the green and orange boxes represent curriculum units taught through workbook and group instruction, respectively. For example LOCAN is a

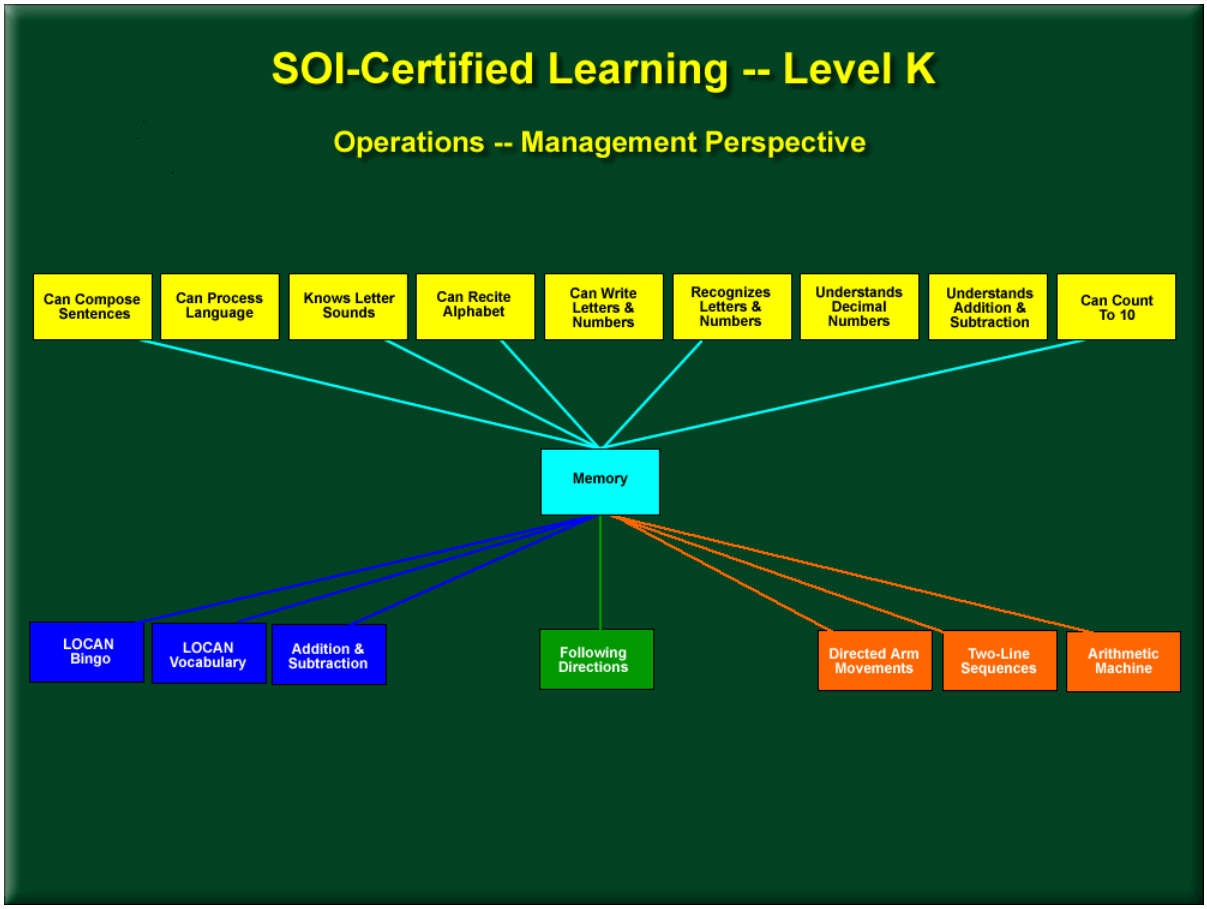

Figure 4. Certified Learning – Kindergarten: Memory

Note: From SOI Certified Learning [Computer software], by R. J. Meeker, 2007, Vida, OR: Goodpasture Productions. Copyright 2007 by Robert Meeker. Adapted and reprinted with permission of the author.

hieroglyphic language. Every word in LOCAN has its own glyph or symbol. The students develop memory skills through a computer exercise that matches a LOCAN glyph with a word (R. Meeker, 2007; R. Meeker, personal communication, May 8, 2008).

Additionally, students need perceptual *skills*, (visual, auditory, and sensory motor) to master the core competencies of the TEKS. These curriculum units (designated in the blue, green, and orange boxes in Figure 5) contribute to the development of perceptual skills. The blue boxes represent the curriculum units taught through computer instruction and the green

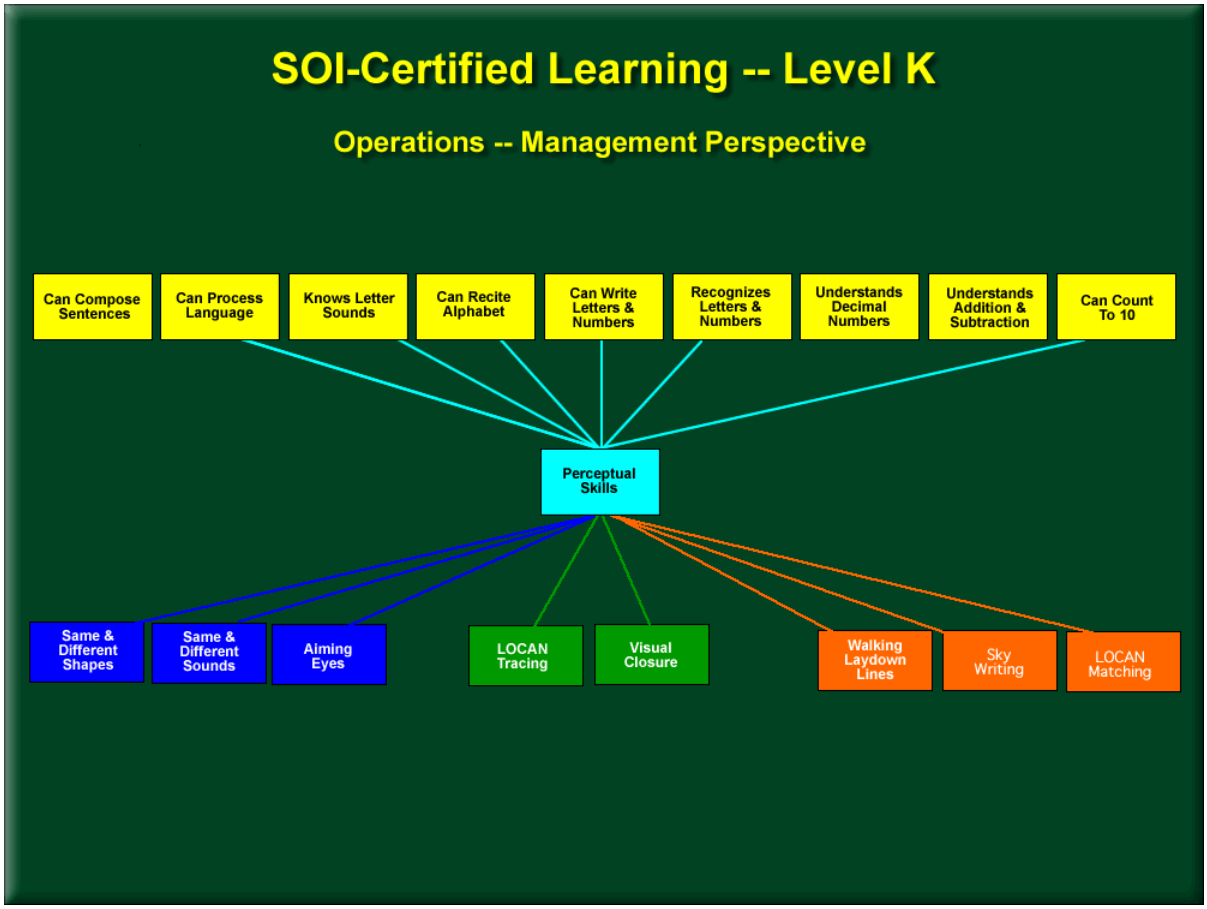

Figure 5. Certified Learning – Kindergarten: Perceptual Skills

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and orange boxes represent curriculum units taught through workbook and group instruction, respectively. For example, sky writing taught through group instruction develops the perceptual skills needed for reading and writing (R. Meeker, 2007; personal communication, May 8, 2008).

Finally, when one views the intermediate objectives or enabling skills as a system (Figure 6), the extensive amount of redundancy designed in the curriculum to facilitate the development of the enabling skills is apparent (R. Meeker, 2007; R. Meeker, personal communication, May 8, 2008).

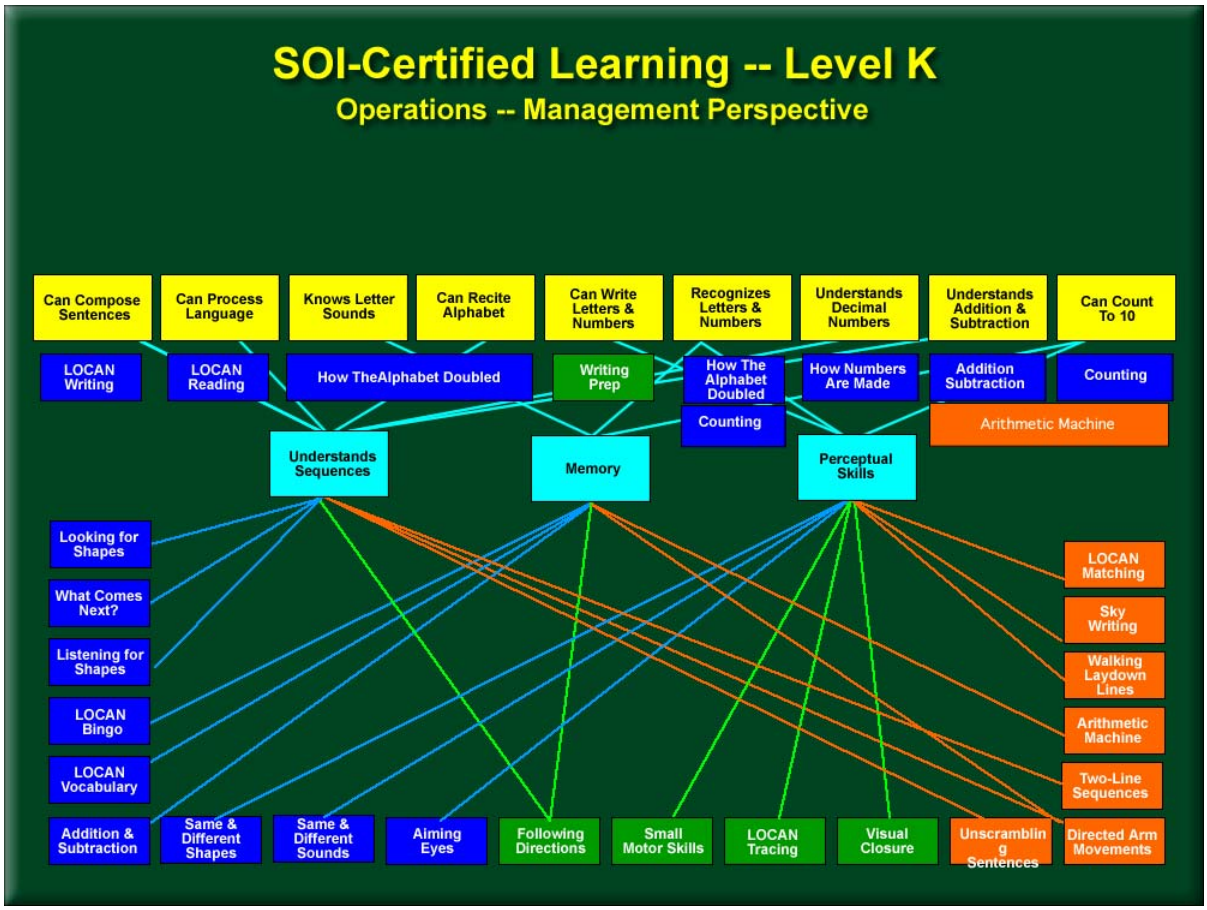

Figure 6. Certified Learning - Kindergarten: Enabling Skills Viewed as a System

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The redundancy in the curriculum is important for two reasons. First, the exercises are reinforcing so that students initially experiencing difficulty should improve with subsequent exercises. Second, the redundancies represent clusters. If a student struggles with most of the units in a cluster, the system highlights the area where intervention is needed. For example, a student who struggled with the computer units (looking for shapes, what comes next, and listening for shapes), the workbook unit (following directions), and the group units (unscrambling sentences, directed arm movements, and two-line sequences) is likely having difficulty understanding sequencing. CLK looks for the underlying reason for the failure, the absence of the enabling skills, and provides the intervention (R. Meeker, 2007; R. Meeker, personal communication, May 8, 2008).

The students move from one instructional assignment to the next, following the assignment cards in their lanyard necklaces. The teacher also has the option of placing the assignment cards on wall charts. The students are responsible for following the assignments in order. In the computer and workbook modes of instruction, the students' immediate goal is to demonstrate that they are ready for a mastery test over the instructional unit. When the students complete the mastery test for each instructional unit without error, they proceed to the next unit in the sequence. The mastery tests vary in length from 6 to 15 questions. If the student cannot demonstrate mastery, he or she returns to the same unit for further practice (R. Meeker, 2007).

In the group mode of instruction, the teacher rewards the students with proficiency tokens when they have achieved one of the steps in the mastery sequence. Once they have earned all of the proficiency tokens for that unit, mastery for that unit is recorded.

The students should master the units in a specified amount of time, such as 10 days for a two-week unit. Some students will master the unit more quickly and will move on to the next unit. Other students will require additional time to master the unit. If a student is not making progress within a unit or has failed the mastery test twice, the management system raises a red flag. A leveled support system is available to offer the teacher suggestions for helping the student to make progress in the unit. The student cannot move forward until he or she achieves mastery in the unit (R. Meeker, 2007).

At the end of each week, the teacher emails a weekly report to SOI Management Systems. From this weekly report information, SOI Management Systems provides two kinds of reports to the teacher, an overall classroom progress report (Figure 7) and an individual student report (Figure 8).

The classroom progress report (Figure 7 – an example, not representing actual student records) displays the progress of each student in relation to expected rates of achievement in the three modes of instruction. The single vertical line in each color indicates the expected level of achievement at the report date for each mode of instruction. The double vertical lines indicate the last instructional unit in each mode of instruction. The horizontal lines in each color show the progress of each student in relation to each instructional mode (R. Meeker, 2007).

The individual student report (Figure 8, not an actual student) provides a profile of the student's progress in the computer instructional mode. Similar reports are available that provide a profile of the student's progress in workbook and group instruction.

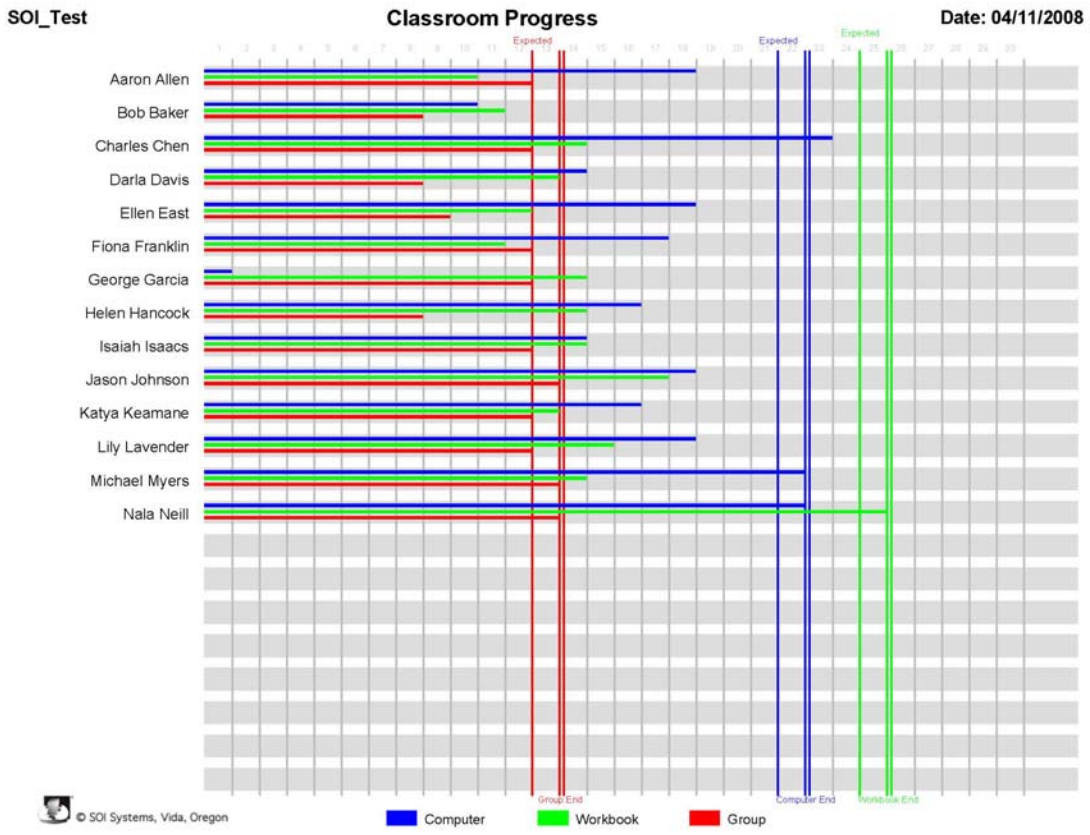

Figure 7. Certified Learning – Kindergarten: Sample Classroom Progress Report

Note: From SOI Certified Learning [Computer software], by R. J. Meeker, 2007, Vida, OR: Goodpasture Productions. Copyright 2007 by Robert Meeker. Adapted and reprinted with permission of the author.

The bars in Figure 8 represent the number of sessions required to achieve mastery for each unit. The report contains trouble indicators that specify if any of the students spent too much time on a unit, failed the unit once, or failed twice. For example, in Figure 8, the progress report for computer instruction, Fiona Franklin has achieved mastery on units CE01 through CE16. The yellow squares in CE09, CE12, CE13, and CE15 indicate that she exceeded the expected time for that unit. In unit CE09, the pink square indicates that Fiona failed the mastery test once. After 15 additional sessions on CE09, Fiona achieved mastery. The excessive number of additional sessions is an example of a design error in the system.

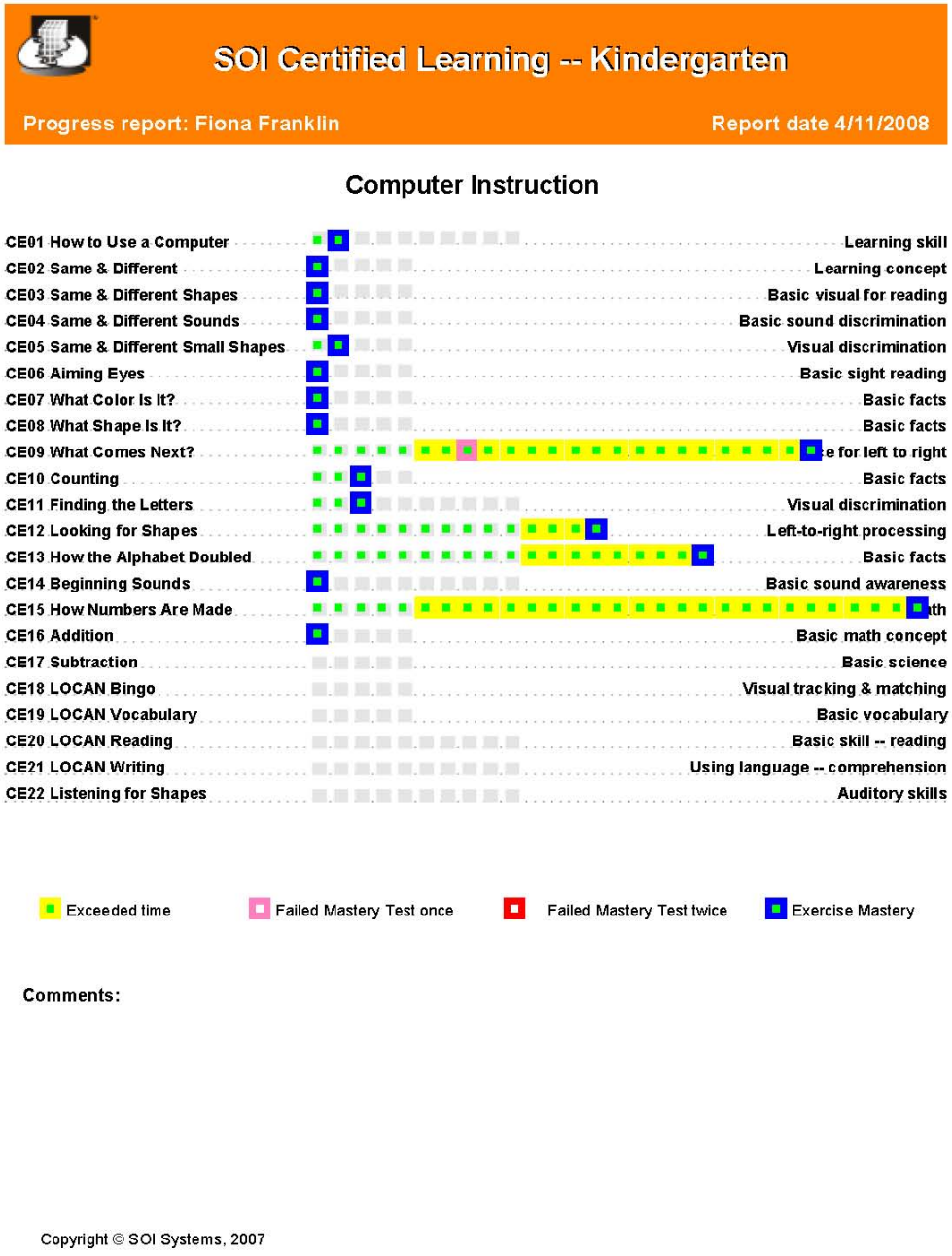

Figure 8. Certified Learning – Kindergarten: Sample Individual Student Report

Note: From SOI Certified Learning [Computer software], by R. J. Meeker, 2007, Vida, OR: Goodpasture Productions. Copyright 2007 by Robert Meeker. Adapted and reprinted with permission of the author.

The system should have provided an intervention earlier. Fifteen sessions on a unit that a student is expected to master in five is too many. Consistent with the principles of

TQM, the system has corrected the design error. In Figure 7, the classroom summary report illustrates that although Fiona is making steady progress, she is not at the expected level of achievement (single, vertical, blue line) for computer instruction at this interval (4/11/08) in the kindergarten year (R. Meeker, 2007).

The earlier a problem is identified, the easier it is corrected. Since much of instruction is cumulative, an uncorrected problem or failure will most likely create a series of failures making future remediation more difficult. The individual student report identifies for the teacher the skills, abilities, or instructional objective the student has not met (R. Meeker, 2007).

SOI Certified Learning Kindergarten utilizes a management system that meticulously follows the progress of every student. If a student does not make adequate progress, the management system detects the problem early and provides procedures for correcting the problem. The system has levels of correction.

At the first level, the teacher provides the intervention after she is alerted by the management system that the student is having difficulty with the unit. If the student is not answering the questions correctly at least 30% of the time, most likely, the student does not understand the concept and needs instruction from the teacher. If the student is answering the questions correctly 30% to 90% of the time, but is not able to master the unit, the problem is likely carelessness. This carelessness is evidenced by the student taking too long on the unit or failing the unit. For students who experience a learning difficulty, but do not respond to intervention from the teacher, the second level of intervention, the SOI Management System provides consulting services. An example of a second level intervention would be a student with a perceptual problem that requires specific remediation. If the second level of

intervention does not correct the problem the student is experiencing, the effectiveness of the unit is evaluated from a systemic approach and adjusted accordingly by the SOI Management System (R. Meeker, 2007; R. Meeker, personal communication, 2008).

Pilot Study Sample

I collected quantitative data (TPRI results) from 21 kindergarten teachers, their students, and the early education director representing five elementary schools in a small urban, Title I school district located in the southwestern part of the United States. The total population estimated to reside in this school district is 35,786. The district's total student population is 5732 students, with the Caucasian population making up 62.6%, the Hispanic population 26.1%, the African American population 8%, the Asian/Pacific Islander population 2.6%, and the Native American population 0.7%. Approximately 45.3% of the children in grades pre-kindergarten through 12 live in poverty, 49.1% are coded at-risk according to state and local guidelines, and 12.3% receive special education services.

The overall level of teaching experience among the 21 kindergarten teachers ranged from 1 year to 27 years (M=11.29, SD=8). The mean number of years teaching in the district in which the study took place was 8 years (SD=5.59).

I collected additional qualitative data from the five teachers piloting a certified kindergarten class. The experience level of the five teachers piloting the CLK curriculum also ranged from 1 to 27 years (M=9.2, SD=10.35). Their mean number of years in the district was 5.6 (SD=5.55).

The total kindergarten population included in the study is 383. The number of students in CLK classes numbered 94, with the Caucasian population making up 64.9%, the Hispanic population making up 21.3%, the African American population making up 10.6%,

the Asian/Pacific Islander population making up 3%, and the Native American population making up 0%. Approximately 63.8% of the CLK students are considered at-risk, 7.5% are coded as special education students, and 41% are economically disadvantaged. According to district guidelines, kindergarten students are considered at-risk if assessed by their performance on the Texas Primary Reading Inventory (TPRI) as "still developing." In comparison, the number of students in the traditional kindergarten classes numbered 289, with the Caucasian population making up 68.9%, the Hispanic population making up 21.1%, the African American population making up 6.6%, the Asian/Pacific Islander population making up 1%, and the Native American population making up 1.4%. The percentage of students considered at-risk is 54%, with 3.8% coded as special education students, and 44% are economically disadvantaged. For the 2006-07 school years, 4.9% of the kindergarten students not in special education were retained, while 13.2% of the kindergarten students in special education were retained.

In each of the five schools, the intention was that the students be randomly assigned to the CLK classrooms. Each school had one CLK classroom. I mailed the parents of the students an informational letter about the pilot program (Appendix A). No parents objected to their child's placement in the program. In addition, permission was requested and granted from Dr. Bob Meeker to include charts, graphs, and other materials from the Structure of the Intellect (SOI) Model and Certified Learning Curriculum in the body of this research (Appendix B).

Data Collection

Data collection included the following sources: weekly meetings for 36 weeks with the five CLK teachers and the early education director, three observations of each of the five

kindergarten classes, a structured interview with the CLK teachers and early education director, a comparative study of the Texas Primary Reading Inventory (TPRI) scores between students in the five CLK classes and the 16 traditional kindergarten classes, a review of the CLK summary reports for each of the five classes, and a follow-up dialogue with the CLK teachers and early education director midway through the second year that the Certified Kindergarten program operated in the district.

When the study began, I was serving the district as the deputy superintendent. This situation posed a potential risk to the participating teachers because as the deputy superintendent, I functioned in a supervisory and evaluative role. To minimize this risk and protect the teachers, I assured them that participation in the study was completely voluntary and in no way connected to professional security or the teacher appraisal system. I confirmed with the teachers that they could refuse to participate or withdraw from the study without professional consequences. My long tenure in the district and established relationship of trust and competency with other district educators provided a foundation for the project and the complexities of the rapport necessary for its success.

Weekly Meetings. During the year-long study, I met with the CLK teachers and the early education director on a weekly basis recording teacher insights and concerns in hand written notes. The context of the meetings transitioned and transformed as the year progressed. In the beginning, the meetings focused on troubleshooting aspects of the program. They later evolved into discussions of student success, the impact of CLK on the students' investment in their learning, and suggestions for enhancing CLK in the next school year.

Observations. Throughout the year, I observed the CLK classes and had the opportunity to interact with students. I watched the different ways the teachers integrated certified learning into their classroom structure.

I observed every CLK classroom a minimum of three times for approximately 90 minutes at each visit. During the classroom observations, I focused on the students' responses to the individual learning format, their ability to independently transition between activities, and the teachers' management of the individualized learning protocols. Field notes were written during the classroom observations and were expanded following the observation.

I began each observation by drawing a map of the room, noting the position of the teacher's desk, the arrangement of the students' desks, the location and type of centers, and the organizational structure of the computer, workbook, and group activities. The classroom observations focused on three primary objectives.

First, I observed how the students responded to the individual learning formats. I spent approximately 30 minutes of each 90 minute observation watching each mode of instruction, recording the students' reactions as they confronted the instructional units they were working on, and looking for evidence of interest, boredom, motivation, frustration, and confidence.

Second, I watched the students as they transitioned between the computer, workbook, and group activities noting the length of time between the transitions, the noise level in the classroom, and whether the students knew which activity to move to when the teacher signaled the end of each period.

Third, I observed the teachers' management of the individualized learning protocols

recording how much direction the teacher gave to the students, how she managed the three simultaneously occurring learning activities, and the attitude she communicated to the students.

Interviews. The interviews formalized some of the teachers' insights and gave them an opportunity to elucidate their observations and experiences with CLK. I designed the protocol for the structured interviews to provide a forum for the teachers to report the positives, the negatives, and offer their recommendations. Additional queries were used when more information was needed. The teachers were individually interviewed for 90 minutes at the conclusion of the 2006-07 school year. I recorded the interviews and later transcribed and expanded them. Below is the interview protocol developed in consultation with an experienced qualitative researcher.

Interview Protocol for CLK Teachers and Early Education Director

Focus on the teacher:

- Please tell me how your classroom and teaching this year with Certified Kindergarten compares to previous years of teaching the TEKS-based curriculum.
- How has the structure of your lessons and curriculum planning changed with the addition of Certified Kindergarten?
- How has your thinking about student progress changed during the piloting of Certified Kindergarten?

Focus on the students:

- Please describe the students in your class this year.

- How are this year's students different from students in previous years? How do students in this year's class compare to students in previous years in terms of their progress?
- What have you observed about your students' progress toward mastery of the kindergarten student expectations?
- What have you noticed since your use of individualized learning protocols for the students?
- What are student attitudes about school this year?
- How do their attitudes compare to students from previous years?
- In what ways are students in your class this year independent learners?
- What kinds of independent learning did you notice in students from previous years?
- How does the reading abilities of this year's class compare to reading abilities of previous classes?

Instrument. The Texas Primary Reading Inventory (TPRI) Teacher's Guide describes the TPRI as "an early reading instrument designed to identify the reading and comprehension development of students in kindergarten and grades 1-2" (Texas Education Agency TPRI Teacher's Guide, 2006, p. 1). The TPRI contains a screening and an inventory section. Teachers in public schools in Texas administer the kindergarten TPRI to students individually three times during the year: after the first six weeks, mid-January, and mid-April (Texas Education Agency, 2006).

The screening section of the TPRI allows teachers to quickly recognize students that will most likely have and not have difficulty with reading concepts. Students receive a score of "still developing" or "developed" on the screening section. Strong performance on the

screening section of the TPRI does not guarantee the student will not encounter some reading difficulties. The TPRI Teacher's Guide states that "the TPRI is designed to supplement and facilitate teacher judgments, not replace them. . . . The performance of students on the screening section signals teachers to focus on the specific instructional needs of their students" (Texas Education Agency, 2006, p. 1). The listening comprehension section of the test is given to all students.

Students who score "still developing" on the screening portion of the TPRI receive the inventory section. According to the TPRI Teacher's Guide (2006), "the inventory section of the TPRI gives teachers an opportunity to acquire more data to help match reading instruction with specific student needs" (p. 1). The reading concepts assessed on the screening section include graphophonemic knowledge and phonemic awareness. The reading concepts assessed on the inventory section of the TPRI include: book and print awareness (optional); phonemic awareness; graphophonemic knowledge; and listening comprehension (Texas Education Agency, 2006).

The most recent TPRI Technical Report states that "the overall reliability of the 1999 TPRI meets commonly accepted standards for reliability. There is no evidence for significant item bias by ethnicity and gender" (University of Texas-Houston Health Science Center, Center for Academic and Reading Skills & Texas Institute for Measurement, Evaluation, and Statistics, 1999, p. 13). Cronbach's alpha was computed. For the middle of year (MOY) and end of year (EOY) kindergarten screenings, (beginning of year screenings for kindergarten were added in 2006), high alpha coefficients in the upper part of the excellent range (.80-1.0) were recorded. The listening comprehension stories had lower

reliability in the adequate (.40-.59) and good (.60-.79) range (University of Texas-Houston Health Science Center, 1999).

CLK Class Summary Reports. The CLK class summary reports provide an overview of each class's progress in computer, workbook, and group instruction.

Post Pilot Year Dialogue. Six months after the pilot year, I conducted a follow up dialogue with the teachers and director of early education, recording the dialogue and later transcribing it. I provided six structured questions to the CLK teachers and early education director prior to the dialogue. Each of the five teachers is in the second year of teaching CLK and I was interested in their reflections now that the pilot year was over. Listed below are the follow up questions:

1. Describe the effect of Certified Kindergarten on the reading achievement of your students during the pilot year.

2. Would the first grade teachers say that the kindergarten students coming from a certified kindergarten class were more or less prepared for first grade than students coming from a traditional kindergarten class? Support your answer with evidence such as comments from first grade teachers, etc.

3. How has your experience with Certified Kindergarten changed your philosophy of teaching?

4. How has your experience with Certified Kindergarten changed your classroom practices?

5. How did the piloting of Certified Kindergarten affect your relationship with your colleagues?

6. Describe the impact of Certified Kindergarten on the student-teacher relationships and student-student relationships in your class.

Data Analysis

I transcribed the data gathered through the weekly meetings, taped interviews, and observations. The initial data analysis began with the reading of the interviews, observation and meeting notes. The teachers' responses and the observation notes were divided into individual units or expressions of unified ideas. Next, the units or unified ideas were separated into topics and assigned code names. Each topic was supported by teacher quotes and observation data teased out of the interview transcripts. The topics were sorted multiple times and refined into meaningful and relevant themes. I discuss the resulting four prominent themes, The *Teachers' Response, Individualization of Learning, Student Mastery of Skills and Concepts,* and *Student Independence and Responsibility for Learning* in the Findings.

I analyzed the TPRI data to determine the percentage of growth in the reading and comprehension development for each of the 21 kindergarten classes.

I examined the CLK class summary reports to determine the progress of each class in the three instructional modes and to determine if CLK impacted the retention rate for the classes.

I evaluated and studied the post-year dialogue with the teachers and director of early education through the lens of educators as active participants and learners and as a further reflection of the teachers' response to CLK.

Findings

The findings of this research characterize the complexity and importance of the kindergarten year in the life of a child. Spending a year with these five kindergarten teachers has illustrated for me that the kindergarten teacher is much like a mother who agonizes over the best way to help each one of her children experience success. The perceptions and experiences of these five kindergarten teachers, the early education director, and myself during the pilot year with CLK, within the context of each mode of data collection are discussed.

Theme 1: The Teachers' Response. The teachers spent the first month resolving technical issues and the concerns that come with change. Some of the teachers reported a feeling of separation from their colleagues at the beginning of the pilot year. Traditionally, the teachers in a given grade level plan their lessons together and try to maintain a similar pace. The teachers implementing CLK, while still a part of their grade level teams, were breaking new ground on their campuses. Our weekly meetings provided a place where teachers could share their experiences and frustrations with each other. On many occasions, they would solve each other's problems with an idea they had tried in their classrooms. As I listened to the meeting dialogue, the need for this network of support was affirmed.

As the first six weeks grading period came to a close, the teachers came with questions about the kindergarten report card. The kindergarten report card was segmented into skills by six-week junctures. The teachers noticed that some of the students were mastering skills all over the report card. For example, isolating ending sounds in words is a skill expected to emerge in the fifth or sixth six weeks grading period of the kindergarten year. Some students were demonstrating mastery of this skill during the first grading period.

Historically, the kindergarten teachers would mark the skills mastered for the current six weeks only. The teachers felt concerned about changing the established procedure, yet they saw the need to individually mark the students' progress. I can still recall the look of relief on their faces when the early education director and I agreed with their assessment and encouraged and supported their decision to break protocol and mark the students' progress where indicated. The parents received a letter of explanation with the report cards. One teacher commented:

> I have never had a class get this far at this point in the year. Almost all of them know their ABC's and sounds. Usually that is something that comes the last six weeks. They are reading; they are reading words. It is just unbelievable. In the past, you might have one or two that shine. But this year, I think I will have a lot more that are shining. And I feel it's the program that did that because I'm not changing that much. It's them . . . . My expectations are high and I think theirs are high, too . . . . I am really proud of them . . . . Their needs have been fulfilled and they know it. I want to cry when I think about it.

Another area of concern during the first semester for some of the teachers was the perception of their colleagues. One teacher shared that her team members had made comments about the students in her class, their difficulty walking in a straight line in the hallways, and the problems they had in pre-kindergarten. They questioned the students' ability to make progress in kindergarten with this new program in place. She expressed the isolation she felt on her campus and commented on the strength she drew from the other Certified Learning teachers in the weekly meetings. She joyfully told the story of one student's development:

> I had one little one who couldn't write his name, didn't know the letters in his name. He has come so far. At the first of the year, I thought that we might have to do some testing because he was so low. We started working. We started doing the computer. We started doing the groups. He had a terrible time walking the line. He just couldn't. So we practiced, practiced, practiced. He couldn't do the workbook because he couldn't hold his pencil. And then, all of a sudden, I guess it was the second six weeks and something started clicking. And it was just beautiful. You could see his eyes lighting up and he felt better about himself. His self- esteem was really low. He was starting to walk the line and he was even showing others how to walk the line. He is just changing like crazy. He knows all of his letters and sounds. . . . . He can color better than some of the girls. And he is the one at the beginning of the year that couldn't see a line. He just needed time to bloom. And he did. I really think it was this program. He is very shy and very quiet and then, he started talking more and coming out of his shell. He's feeling better about himself and it's just like night and day. If nothing else, that made my year.

On several occasions, we had conference calls with personnel from SOI Systems. The teachers sometimes questioned the sequence of a skill or the difficulty level of a concept. Their ability to have input into the curriculum was empowering and encouraging. Their suggestions were always met with openness and consideration.

Most significant during this beginning time with CLK was the relationship that was forming within the group. Although I was the deputy superintendent and later the superintendent, I was a teacher in the group. I had the privilege of listening to the teachers talk from their hearts about their concern for their students, their frustration at not being

understood by their colleagues, and the affirmation they received at the weekly meetings. The experience of being one of them, in a sense, for an hour each week taught me much about the heart of a true teacher. After being in administration for a number of years, one can easily forget how hard it is to be responsible for the success of 22 five year olds. This experience reminded me that a kindergarten teacher struggles daily with knowing how to help each one of her students all at that same time.

As the spring semester began, the discussion in our weekly meetings turned to the next school year. The teachers asked if they could continue with Certified Learning in the next school year. A teacher said:

> I think their TPRI scores show that their progress has improved tremendously so why wouldn't you want to do this. I have been teaching 27 years and I wish this program had been available a long time ago. Don't take it away now.

A different teacher shared that she could not imagine teaching without it. She commented, "I don't even have one student that I am thinking about retaining." Another talked about the security she felt in being able to measure daily the students' progress in the curriculum. Yet another talked about knowing her students more as individuals and not only as a group. One marveled at the change in her colleagues' perceptions from skepticism to intense interest in the progress the students were making. The development of their students and their own development as teachers and leaders intrigued me.

The director of early education discussed the impact of CLK on the teachers' ability and confidence to address the diversity of needs in the kindergarten classroom:

> I feel that our present system of education, in trying to address the needs of all children, have created pull out programs, . . . different certifications and

> endorsements teachers can receive which make these teachers eligible to teach all these different ranges of needs and abilities. I think an unintended outcome of this is that the classroom teacher feels she needs to teach to the mid-stream of her children's abilities. . . . If that child has a need such as gifted and talented, if the child is autistic and there is something in their academic need that requires the teacher to utilize another set of skills, I think the teacher feels that she is incapable of doing it. So it has created a feeling of deficiency. However, Certified Learning, we know from experience with our five classrooms this year, has helped teachers to redevelop the mindset that they are everything to that child. That they can take care of the child's needs regardless of whether the child has autism, whether the child has epilepsy, whether the child is gifted and talented because all of these children are on the learning continuum, and they are all progressing at their own individual pace.

In response, a teacher said:

> I have a little boy in my class with autism. He is an absolutely brilliant little kid. The consistency of CLK is huge . . . always knowing what he is doing . . . in computer, workbook, and group. . . . In previous years, I would have referred him to special education.

I was continually impressed and encouraged by the way they taught and learned from each other. Weekly, one of the teachers would share a difficulty she was having with the program or with some other part of her day. Invariably, another teacher would speak up and share how she had handled that challenge. The culture of the group developed into a network of support and professional and personal growth.

Almost on a parallel track with the culture of the teacher group was the culture of support the teachers noted developing among the students in their classrooms. The students had begun cheering on and encouraging each other's development. The result seemed to be a greater sense of security among the students to progress at their own level. In one school, the parents were so pleased that they requested that the kindergarten class loop to the pilot Certified Learning first grade class for the 2007-08 school year.

Theme 2: Individualization of Learning. Certified Learning, rather than determining progress by comparison to others, identifies each child's current state of ability development and customizes the instruction accordingly. Success is measured based upon the individual student's ability development, so that each child progresses at his or her own speed. The following quote from the director of early education illustrates the difference of perspective in a Certified Learning classroom.

> When I would talk with kindergarten teachers before, they would talk about what this child knows, their report card, what his or her progress is. Student progress many times is based on how that child compares in a group with other children. We have our high learners, we have our low achievers, and we have our children right there in the middle. Children's progress is compared to their standing in relation to other children in the classroom. And so I think we develop this mindset of a child's progress based on where we subconsciously place them in that class ranking. However, Certified Learning takes that all away because for each child that learning is individualized, and they progress at their own speed. Their progress is not compared to any one else, and I think that we are realizing that for these little ones, that learning is an individualized process even though there are certain skills that are

> identified at each step that have to be in place. I think that's progress; it is truly an individual effort. It is not a class effort at all.

A Certified Learning kindergarten teacher expressed her perceptions this way:

> Just spending more time with them and knowing who they are makes a huge difference because it is who they are as individuals, and not as my class. They are each, one, my student. I can say this one did this, and that one needs this. You know, it makes me think why he is not getting it, I wonder why, why he is not able to . . . ? And then I can ask the question why, what do I do to help them get back? So, definitely, I know them more as a person with all the assessments. Being with them one on one.

Another Certified Learning kindergarten teacher offered this reflection:

> In the past, I always taught to the class as a whole and then did some reteaching with individual groups. This year I know each child's needs. And because we work so close with this particular program, I get to know each child's abilities daily because we check for mastery every day. So you really know them individually. In the past I taught to a group, and now I teach to individual children.

These three examples reflect the value these educators perceived in the individuation of learning. The benefits mentioned included teachers being able to see and appreciate each child as an individual learner, children learning and progressing at their own speed, and educators feeling like they get to know each child's "story," providing them a clearer understanding of each child's abilities and progress. As such, the teachers viewed this first theme of the individualization of learning as beneficial for the students.

Theme 3: Student Mastery of Skills and Concepts. In Certified Learning, the goal for each student in each of the instructional units is to demonstrate that he or she is ready for a

mastery test. The students must complete each mastery test without error. If the student can do this, the teacher records mastery and the student progresses to the next unit. If the student cannot demonstrate mastery, he or she returns to the same unit for further practice. The data tells the teacher where the concerns are. The kindergarten student in the Certified Learning class progresses at the child's own pace and receives prescriptive assistance and support. As one teacher expressed:

> I think before I assumed, instead of making sure, and now it is a definite making sure because they cannot go on until they have mastered it. So I think that it is definitely positive because they are getting what they need before they move on to the next concept.

The same kindergarten teacher later went on to offer a detailed expression of her appreciation for how practical the student mastery of skills and concepts is in the classroom:

> Well, when they master a concept, they get to go on to the next concept. Even if their friends are not going, they are going. Before Certified Learning, I was guilty of progressing to the next item on the curriculum agenda without reason other than that is what the list said I was to do. You keep moving and they are not getting those things. Or you stay on it and a child has already mastered it and they are bored out of their brains. Because you are still teaching it and they know it, so I think that is a big factor. It's their thing. And they know it's okay if you don't get mastery that day and your friend does. It is not because I don't like you, but it's because I want you to do your best and be your best. Now my students have a foundation that is firm, where no step is assumed, skipped, or overlooked but really seen.

Student Mastery of Skills and Concepts also affords teachers the opportunity to provide positive regard to students without negative comparisons to the group. The following scene recorded from an observation between a kindergarten teacher and her students depicts this opportunity for positive regard.

> "Is everybody ready to test for mastery on shape design?" the teacher asks. Tim says, "No," and names the students that are ready. The teacher asks the students, "Does that mean that the students that are not ready are not good enough?" The students say, "No, it means they are not ready yet." Tim tests for mastery first. He traces the shapes in the air with his hand three times. His eyes are carefully focused. All of the other students sit quietly while Tim tests. He achieves mastery. A big grin spreads across his face as he takes his seat. Three additional students test for mastery and are successful. Each student smiles as they are congratulated for achieving mastery.

Thus, the environment of the Certified Learning classroom can be one of community support as opposed to the comparison and competition often present in the traditional classroom. Students can experience joy and celebration as they achieve and progress at their own pace.

Theme 4: Student Independence and Responsibility for Learning. Certified Learning assumes children to be natural learners who can learn to manage their own scheduled assignments as they independently progress through the units. In the beginning of the year, the teachers' consensus was that the room resembled organized chaos. However, as the students continued to develop, self-directed behavior replaced organized chaos as delineated in the comments from the director of early education and teachers and reflected in the class observations:

> The child is so involved in determining how far they are going to get, because that is an inherent determination. Because they decide, okay, I am going to work at this and I'm going to keep going and I'm going to attain that mastery or I'm just not going to work so hard today. I mean it's an instant reflection on them. I think because they know that mastery is just around the corner, and when they work hard that gives them confidence. Self-determination, that's the word I am looking for. I think that's an attitude that I see in Certified Learning that I don't see in traditional classrooms, that self-determination thing. If I do see it in a traditional kindergarten class, I think it is because of external environmental factors outside the classroom.

The director of early education went on to say:

> I don't think that in a traditional classroom that we instill responsibility in children that is linked to learning. We might instill responsibility in them to help keep the classroom clean, but it is not responsibility for their own learning. And that's the biggest difference that I see in a student attitude in Certified Learning. They're responsible for their learning not just keeping the classroom clean like I said before or making sure everybody gets a turn; it's a different kind of responsibility.

A teacher offered this reflection after reading a quote from Marva Collins:

> "There is a brilliant child locked inside every student." There is and that is what CLK is. I can't change what their parents do and I can't change what is going to happen when they move away from me. But when they are with me I can teach them that it has to come from inside of you. I think that is my biggest change as a teacher. And they [the students] are learning it. And they know it. And they know they know it.

Another teacher shared this perspective:

> I think also the children appreciate the structure of it; because if I get off of the structure of it, they don't like it. I think that helps their progress, too. So many times in the past other things would get in the way. You would kind of go here and go there and it wasn't laid out for them. I think knowing what comes next, where they go next, helps their ability to handle the learning.

A different teacher shares a similar thought:

> The consistency of what they are doing . . . and knowing that it is going to happen. I think it overwhelms children when we say, oh, we are going to change it. They know we have a plan, they know it is going to happen at that time of the day. I think that is huge because it is a constant. I also think just knowing if I do better, I going to get to go on. Inside of them, they want to do better. Boom, the time is gone because they are engaged in it.

The student's self-investment is an important collateral educational objective of Certified Learning. Student confidence increases with every measure of real success, providing them with, not necessarily self-esteem, but a sense of self-empowerment that is necessary for future learning.

In summary, before Certified Learning, the focus in the district's kindergarten classes was on the children's progress toward the expected group norm. Report cards were segmented into expected skills at each six-week juncture. Students tended to fall into classifications; gifted, average learners, or low achievers. If a teacher could not check off the expected skills on the kindergarten report card, district guidelines considered the student at-risk. Often, the assumption was that either the child was not trying hard enough or needed to be referred to special education.

Certified Learning makes no such assumptions. Meeker (2005) proposed that "the ranks of the residual underachievers are filled with those students who do not meet the assumptions of the group instruction" (p. 4). The key to unlocking a child's learning potential is to see them, to see them where they are on the learning continuum, and to respect all the child brings to the learning situation. Meeker (2001) contends that every child knows inside information about himself or herself. When we don't look and don't ask, we make assumptions and miss out on the uniqueness of the child's story.

Second, before Certified Learning, teachers moved students along at the pace of the group and mastery was not required before proceeding to the next skill or concept. At the end of the kindergarten year, students who had not kept up or caught up with the group were often retained. The underdeveloped abilities of the "failing" student were not addressed and often the student was considered to have a learning disability.

In the CLK classroom, students cannot fall behind because they work at their own pace and cannot proceed until they have mastered the specific skill and concept. Each student gets what he or she needs before moving on to the next concept. Additionally, CLK provides the teacher an opportunity to express positive regard to the children, celebrating their mastery of material without drawing comparisons to other students.

Finally, before Certified Learning, teachers organized the curriculum around learning themes and content knowledge. Student investment and independence in the learning process were not well developed. With Certified Learning, the curriculum is built upon concepts with content coming after the concepts are mastered. Concepts give the children a framework for internalizing the learning.

CLK is structured to develop student independence and responsibility in the learning process. In my administrative experience, it seems that at times the teacher can become more invested in the child's learning than the child. In this age of accountability, this approach can lead to more focus on the teacher's performance and less focus on the child's development. Consequently, the fulfillment of learning is lost for both the teacher and the child. In the CLK classroom, the focus is on individual student mastering of the learning tasks. As a result, the student's success contributes to a sense of self-efficacy and personal investment in learning. Teacher confidence and competence are more closely connected with student achievement than with the teacher's performance. Combs (1965) observed:

> The task of the teacher is not one of prescribing, making, molding, forcing, coercing, coaxing, or cajoling; it is one of ministering to a process already in being. The role required of the teacher is that of facilitator, helper, assister, colleague, and friend of his students. (p. 16)

TPRI Results. The TPRI screening results for the beginning and ending administrations for the five Certified Learning kindergarten classes were compared with the results for the 16 non-Certified Learning kindergarten classes. Beginning and end of the year listening comprehension results were also contrasted. Inventory items were not compared due to the inconsistency among schools in administering these items.

Only the results of students who had both beginning of year (BOY) and end of year (EOY) screening and listening comprehension scores were compared. The results of students with incomplete data were eliminated. Comparative data for 94 CLK students and 289 traditional (TRD) classes for the five schools (K-01, K-02, K-03, K-04, and K-05) were compared.

First, a comparison was made by campus of the BOY and EOY screening and listening comprehension results (Figures 9, 10, and 12). Second, a summary of the screening and listening comprehension results for the 5 CLK classes was compared with the summary of results for the 16 TRD classes (Figures 11 and 13).

For campus K-01, 1 CLK class (n=20) is compared with 1 TRD class (n=17). Note in Figure 9 that the percentage of students developed at the beginning of the year in CLK-01 is greater than the percentage of students developed in TRD-01. The CLK-01 class shows 100% of the students developed on the EOY screening, while the TRD-01 class shows 94%; however, the percentage of growth (35 %) for TRD-01 is greater. A comparison of the BOY and EOY listening comprehension data yields some interesting results (Figure 12). Although the TRD-01 showed 94% of the students developed on the BOY administration, only 68% are developed on the EOY administration, a decrease of 26%. Results for CLK-01 report a BOY percentage of 70 and an EOY percentage of 95 (a growth of 25%).

For campus K-02, 1 CLK class (n=20) is compared with 3 TRD classes (n=56). Note in Figure 9 that the percentage of students developed on the BOY screening for CLK-02 (30%) is less than the percentage of students developed for TRD-02 (43%). On the EOY screening, the percentage of students developed for CLK-02 (95%) is greater than the percentage of students developed in TRD-02 (79%). The percentage of growth for CLK-02 was 65% compared to TRD-02 at 36%, a considerable difference. A comparison of the listening comprehension data (Figure 12) displays a small decrease for CLK-02 on the EOY listening comprehension test (60% to 55%). Data for TRD-02 show an increase in listening comprehension scores from 54% to 68% (a growth of 14%).

For campus K-03, 1 CLK class (n=19) is compared with 6 TRD classes (n=97).

Observe that for this campus, both BOY and EOY scores for CLK-03 (47%, 89%) and TRD-03 (40%, 90%) are similar (Figure 9). Subsequently, the percentage of growth is comparable at 42% and 50%. A comparison of the BOY and EOY listening comprehension scores (Figure 12) illustrates a much higher percentage of growth in CLK-03 (69%) to that of TRD-03 (17%). In fact, the percentage of growth is higher than any of the other kindergarten classes in the study.

For campus K-04, 1 CLK class (n=16) is compared with 2 TRD classes (n=37). Note on Figure 9 that on this campus the percentage of students developed on the BOY screening in CLK-04 (12%) is substantially lower than for TRD-04 (49%). Although the EOY screening for CLK-04 (56%) is considerably lower than TRD-04 (86%), the percentage of growth is greater for CLK-04 (44% compared to 37%). A comparison of BOY and EOY listening comprehension scores (Figure 12) reveals a higher percent of growth in CLK-04 (24%) than in TRD-04 (9%).

For campus K-05, 1 CLK class (n=19) is compared with 4 TRD classes (n=82). Note on Figure 9 that on this campus the percentage of students developed (32%) is less than for TRD-05 (58%). Although the EOY screening for CLK-05 (74%) is less than TRD-05 (90%), the percentage of growth is larger for CLK-05 (42% compared to 32%). A comparison of BOY and EOY listening comprehension scores yields a decrease for CKL-05 of 5% to an increase for TRD-05 of 12% (Figure 12).

Next, a comparison of the five CLK classes (N=94) and the 16 TRD classes (N=289) is presented. BOY screening results were slightly less for the CLK classes (43% developed) compared to the TRD classes (48% developed). The growth as measured by the EOY screening was similar with 41% growth for the CLK classes and 40% growth for the TRD

classes (Figure 11). A comparison of BOY and EOY listening comprehension data shows that while TRD classes (56%) had a greater percentage of students developed on the BOY screening than the CLK classes (45%), the CLK classes showed a larger percentage of increase (20% to 13%). Refer to Figure 13.

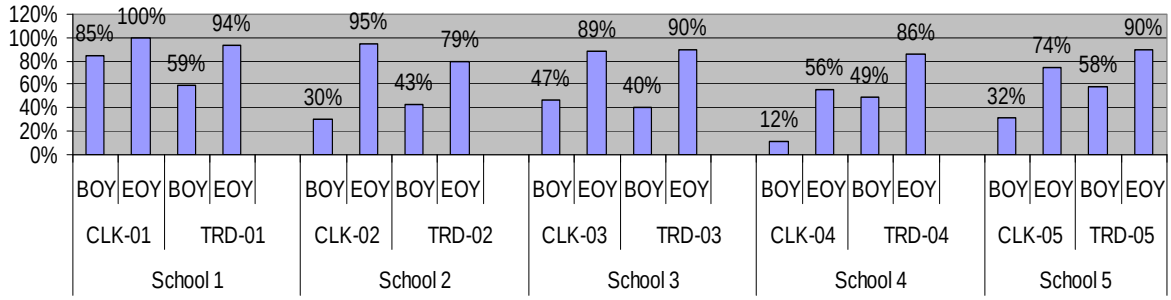

Figure 9. TPRI Beginning of Year and End of Year Screening Percentages

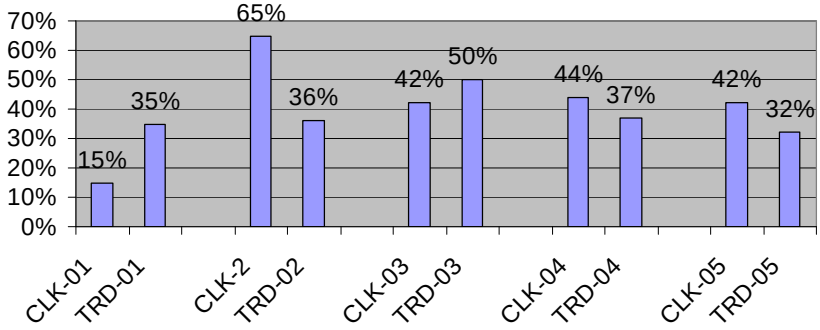

Figure 10. TPRI Beginning of Year and End of Year Screening: Percentage of Growth

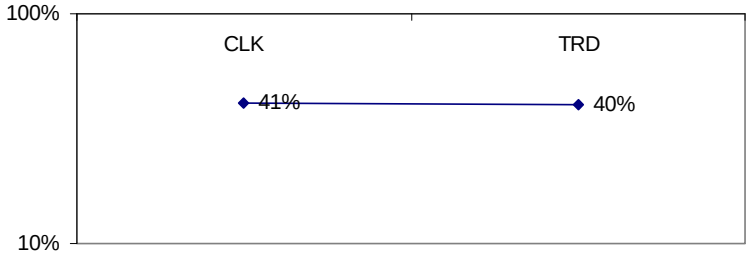

Figure 11. Comparison of Percentage of Growth on TPRI Screening Summary of Certified Learning Kindergarten (CLK) Classes and Traditional Kindergarten Classes (TRD)

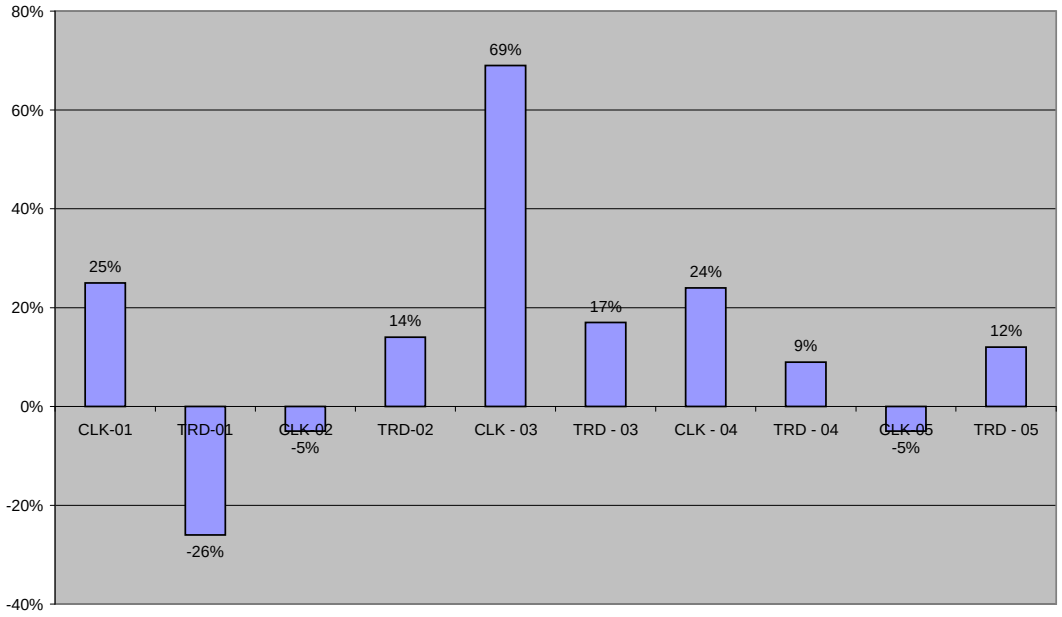

Figure 12. TPRI Beginning of Year and End of Year Listening Comprehension Percentage of Growth

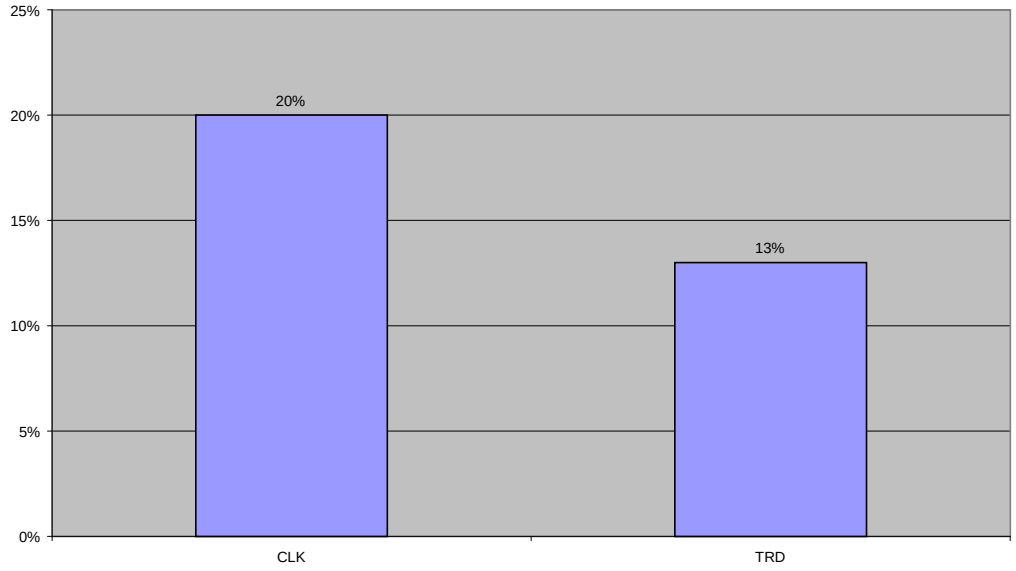

Figure 13. Comparison of Percentage of Growth on TPRI Listening Comprehension Summary of Certified Learning Kindergarten (CLK) Classes and Traditional Kindergarten Classes (TRD)

CLK Class Summary Reports. At the conclusion of the 2006-07 school year, class progress in computer, workbook, and group instruction was reviewed. Each of the three modes of instruction is organized into units distributed over 32 weeks of instruction.

In general, computer progress fell below the expected level. No students completed the computer units. This result and teacher feedback led to revision of the computer units for the 2007-08 school year. The units were reordered and some units were refined and shortened based on the teachers' recommendations.

In contrast, workbook progress exceeded expectations. Fifty-eight of the 94 students completed the workbook prior to the end of the school year. For the 2007-08 school year, a second workbook was added to the CLK curriculum to allow for further skill development in students ready to progress.

Progress in group instruction was below, but near the expected level. No students completed the group units. Revisions for the 2007-08 school year included a reordering of some of the units to provide for a more developmentally appropriate and fluid sequence.

The progress for class CLK-01 is depicted in Figure 14. All 20 students completed at least 50% of the computer units. Nineteen of the 20 students completed the workbook. Sixteen of the 20 students completed at least 50% of the group units. All students were promoted to first grade.

Figure 15 depicts the progress for class CLK-02. Ten of the 20 students completed at least 50% of the computer units. Three of the 20 students completed the workbook. Twelve of the 20 students completed at least 50% of the group units. Only one student was retained and continued in CLK for the 2007-08 school year.

The progress for class CLK-03 is illustrated in Figure 16. Every student completed at

least 50% of the computer and group units. All 19 students completed the workbook and were promoted to first grade. The progress in this class exceeded the progress in the other four classes. One possible variable is the teacher is a veteran with 27 years of experience.

Figure 17 represents the progress for class CLK-04. Four of the 17 students completed at least 50% of the computer units. Eleven of the 17 students completed at least 50% of the workbook units. All 17 students completed 50% of the units in group instruction. The lack of comparable progress in this class may be attributed to the learning curve for a beginning teacher. Only one student was retained and continued in CKL for the 2007-08 school year.

Figure 18 portrays the progress for class CLK-05. Fifteen of the 19 students completed at least 50% of the computer units. Seventeen of the 19 students completed the workbook. All students completed at least 50% of the group units. Of the two students that were retained, both had late summer birthdates and continued in CLK for the 2007-08 school year.

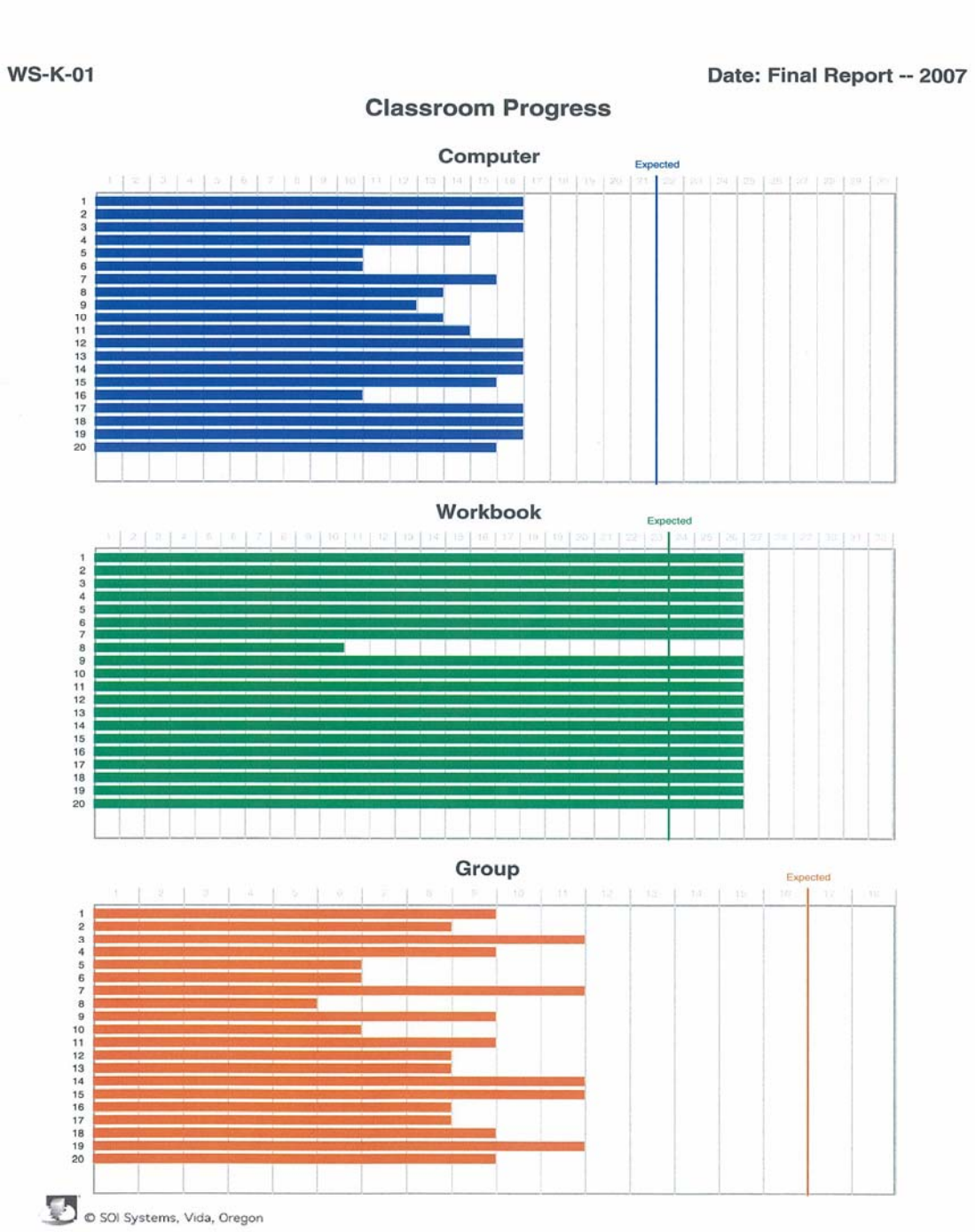

Figure 14. Classroom Progress Report for CLK-01

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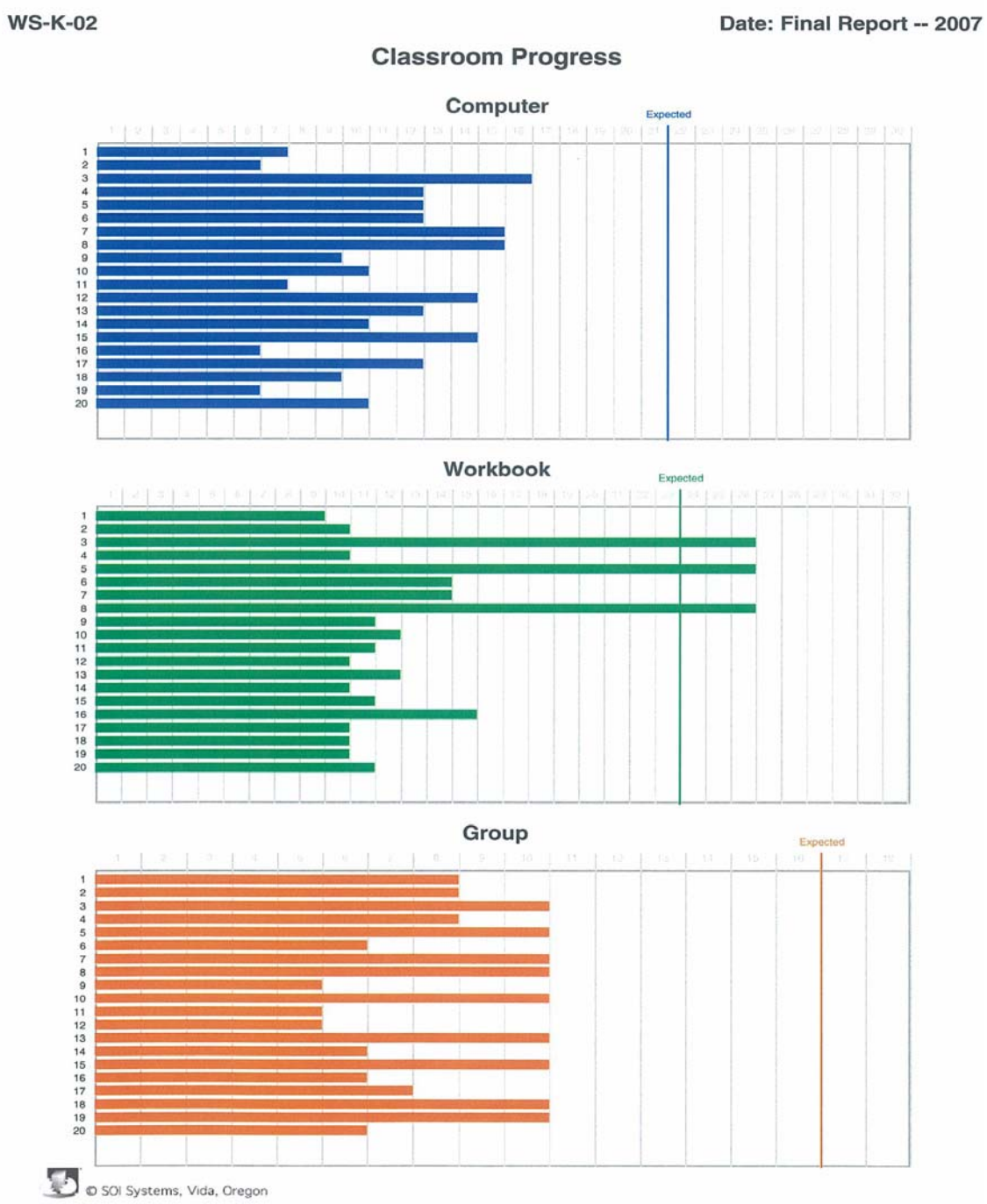

Figure 15. Classroom Progress Report for CLK-02

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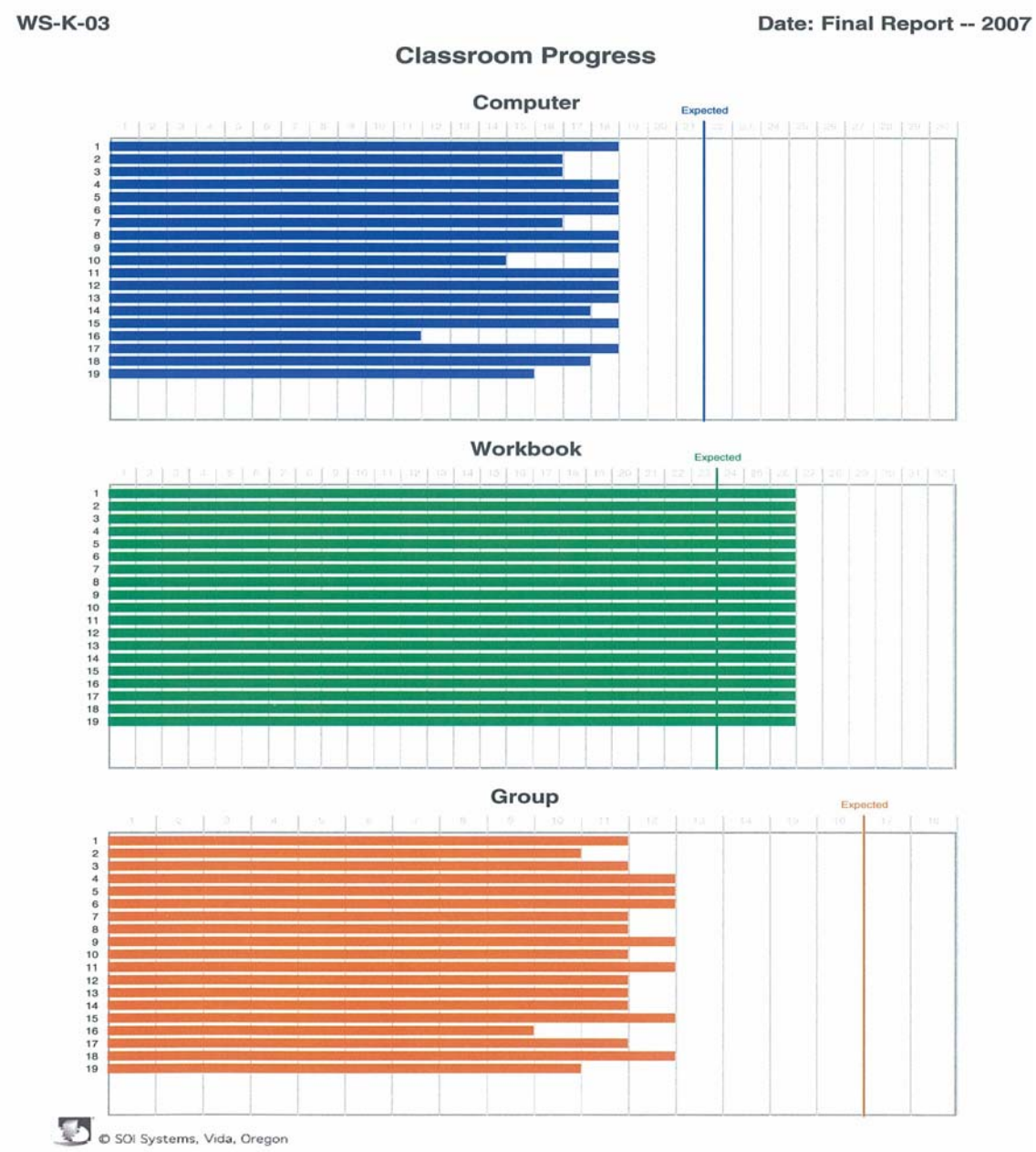

Figure 16. Classroom Progress Report for CLK-03

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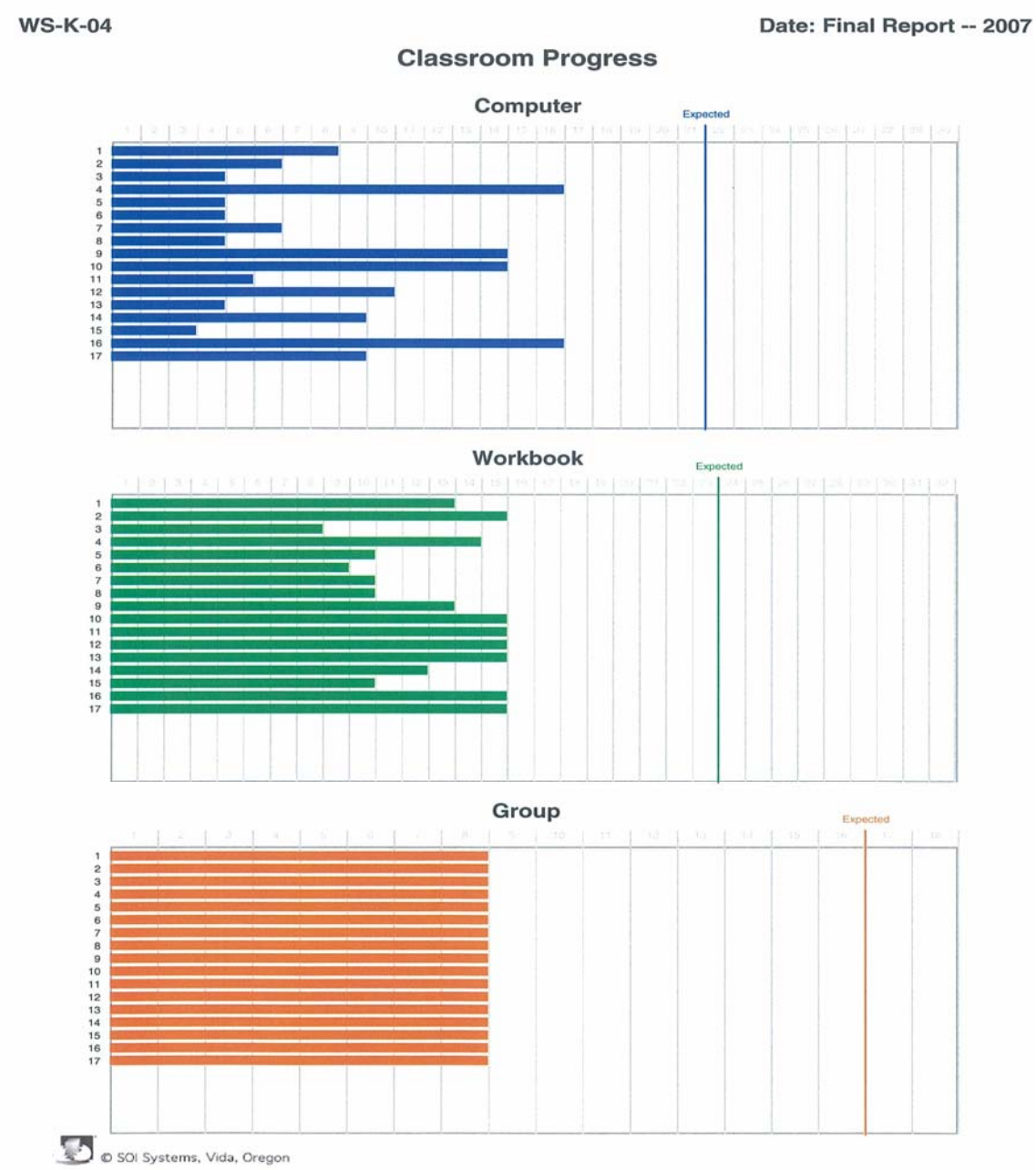

Figure 17. Classroom Progress Report for CLK-04

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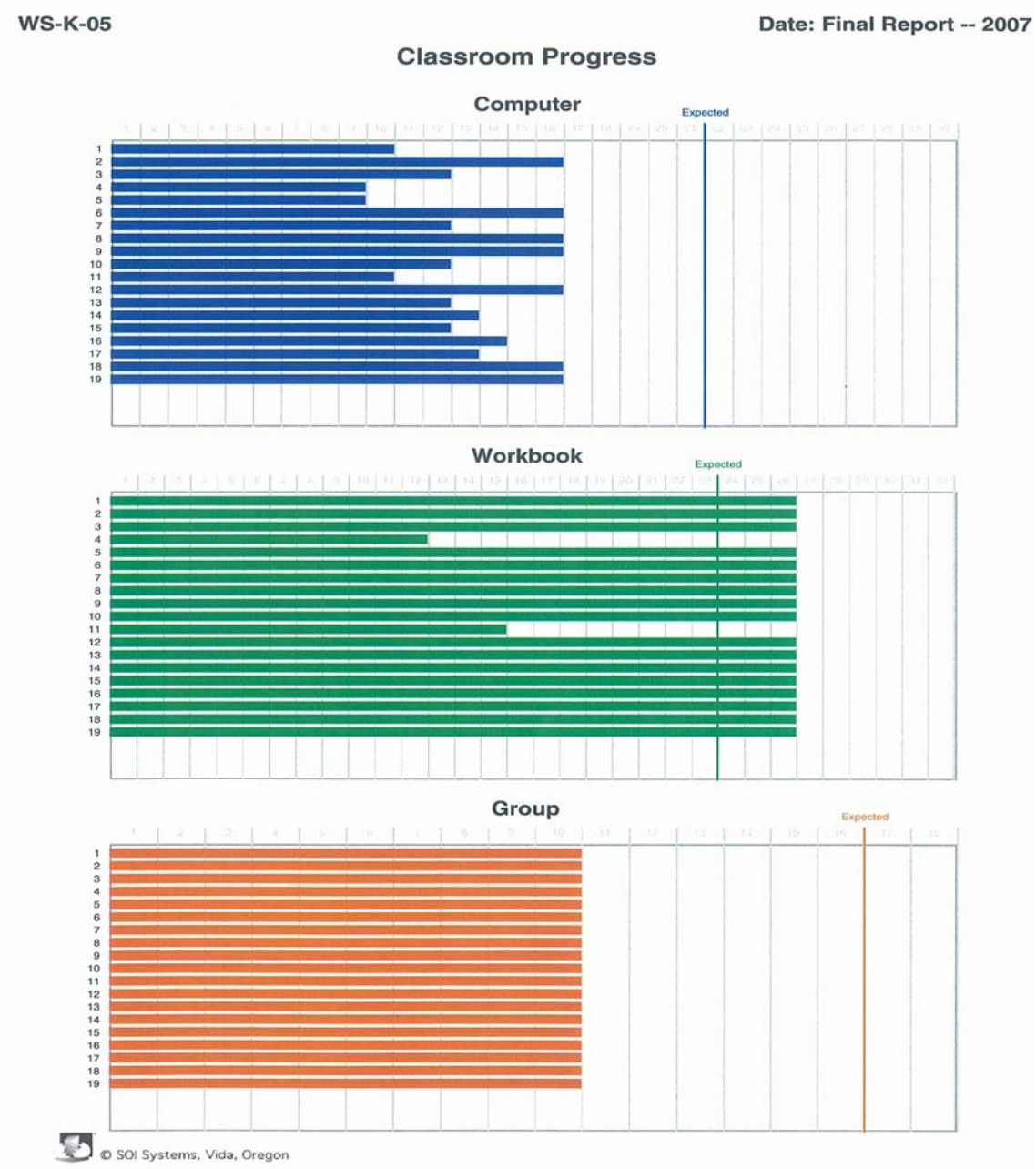

Figure 18. Classroom Progress Report for CLK-05

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Although many of the students in CLK did not complete all of the units in the computer, workbook, and group modes of instruction, 95.7% were promoted to first grade. Only four students were retained and no students were referred to special education.

Post Pilot Year Dialogue

This section discusses the perceptions of the kindergarten teachers and early education director according to six different issues: (a) the students' reading achievement, (b) first grade teachers' perceptions, (c) philosophy of teaching, (d) classroom practices, (e) relationship with colleagues, and (f) teacher-student relationships and student-student relationships. The teachers and director of early education received the questions prior to the focus group meeting. I asked the teachers to have conversations with the first grade teachers about their experience with the students who had been in a CLK class. The focus group meeting was recorded and later transcribed. The teachers' responses to the six questions were summarized and the quotes supporting their beliefs were charted.

Question 1. Describe the effect of Certified Kindergarten on the reading achievement of your students during the pilot year. Four of the five teachers commented that their pilot year classes consisted predominantly of students with underdeveloped abilities. Although the class composition was designed to be random, 4 of the 5 classes had predominately students considered to be at-risk. Of the 94 students in CLK, 63.8% were designated as at-risk in contrast to the district kindergarten average of 55.9%. Since one of the teachers was a first year teacher, she acknowledged that her only method of comparison was her current year's class. Three of the five teachers reported significant development in their students' skills based on report card information, TPRI data and student confidence from the beginning of the year to the end of the year. Of the two remaining teachers, one asserted that the students in the pilot year had outperformed all of her previous classes. The other teacher stated that she saw less growth in her pilot year class. All five teachers commented that the students in the second year of CLK seemed to be progressing faster than during the pilot year. They

concluded that their increased understanding of the program and the reordering of some of the instructional units could account for the increase in student mastery.

Question 2. Would the first grade teachers say that the kindergarten students coming from a Certified Kindergarten class were more or less prepared for first grade than students coming from a traditional kindergarten class? Support your answer with evidence such as comments from first grade teachers, etc. Of the five CLK classes, one class looped to a Certified Learning first grade class. The receiving first grade teacher noted that the CLK students demonstrated better self-control, such as the ability to sit in a chair, and better academic skills, such as handwriting, ability to track words in reading, and math skills. Responses from other first grade teachers also included better math skills, handwriting, and self-control. The teachers did not report a difference in the CLK students' reading skills as compared to students coming from a traditional kindergarten class. One teacher shared a parent's opinion that she felt so pleased with her son's progress in Certified Learning that she hoped he would be in it until he graduated.

Question 3. How has your experience with Certified Kindergarten changed your philosophy of teaching? The teachers unanimously agreed that CLK had changed their philosophy of teaching, moving them from teaching to the group to teaching to individual children. Of the five teachers, four commented that they now do most of their instruction in small groups. One teacher replied, "I'm going to the child, and not expecting them to come to me . . . because it just makes more sense." Another teacher gave this description,

> I can tell you things about my kids that I probably would've never known about my kids in the past. So, this year has really changed my philosophy, starting last year,

> but it's really kind of happened more this year because I've seen the good things that are coming from this group.

A different teacher shared this reaction from her student teacher,

> My student teacher . . . went and visited another class, and said that it wasn't the same. Everybody doesn't rejoice in each other's learning, they spend most of the day saying, sit down, be quiet, it's not a learning environment, this is a learning environment. She wanted me to tell her more so it's definitely changed my philosophy, wish I'd known it sooner.

One teacher responded that her experience with CLK had caused her to question some of the things she had learned in college and to evaluate more carefully what skills were developmentally appropriate for her students. The early education director commented that her observation of the CLK classes had also changed her philosophy of teaching causing her to reflect on her days in the early childhood classroom and conclude that she would be a changed person if she taught again. She discussed the revelation of encouraging each child's development without comparing them to the assumed standard of the group.

Question 4. How has your experience with Certified Kindergarten changed your classroom practices? More small group and focused instruction was the consensus of four of the five teachers. One teacher noted:

> We get in and we get what we need to get done. We don't do fluff as much… but we have a purpose and we have a mission . . . they get what they need . . . and this is the focus that we're looking at . . . doing what they individually need. . . . I think I'm more focused than I ever was before.

All five of the teachers commented that they approach struggling students differently and no longer refer them to special education. They acknowledged that in the past they referred to special education because they did not know any other options. One teacher explains, "There's a reason why he doesn't know a letter or a sound . . . and that's changed my practice because I would not have known how to help him before." Another teacher stated, "I don't want to teach without it because it speaks to the needs of the whole child."

Question 5. How did the piloting of Certified Kindergarten affect your relationship with your colleagues? All of the teachers discussed the challenge of change. Three of the five teachers reported some degree of jealousy from their colleagues during the pilot year. Two of the teachers reported curiosity and interest and being asked by colleagues to share ideas. Two reported that the jealousy had decreased when their colleagues had witnessed the amount of work involved in a pilot program and had seen the results with some of the students. One teacher offered this response:

> They have seen the total difference of making some changes in our traditional kindergarten that they have been used to teaching; I think they see the benefit of doing what I'm doing . . . and they are willing to make changes, so I think that's part of the positive attitude. They're all very supportive of me . . . but it's taken some time to make those adjustments, and see that this is a lot of work, and seeing that there are some good things, especially with certain kids that have come from it.

Each of the teachers emphasized the importance of being open to change and the difficulty that occurs in collegial relationships when the resistance to change is present.

Question 6. Describe the impact of Certified Kindergarten on the student-teacher relationships and student-student relationships in your class. Four of the five teachers

commented that CLK has provided an avenue for knowing their students better, allowing them to celebrate individual student success in a more meaningful way. A teacher contributed, "We celebrate each other so much, and they're excited, and they have a lot more enthusiasm in our room. . . , and I think that fosters a good relationship between myself and them." Another commented, "I know each one of them far better because of the one on one. I also feel that they share more because they know they can trust you, they know you care about them; they know that you celebrate in their learning." The same teacher went on to say:

> They know that's time that you will make for them, for their learning, and they feel that importance, they know that you feel that importance. I think in the past, I just did a lot of, "Let's hurry, let's get this done, let's go on to the next unit;" whereas, on this, it's developmentally appropriate, and it's what that child needs, and that child knows that's what he needs.

The early education director made this observation,

> The teacher, and I'm talking from experience, they have the knowledge. They have to impart the knowledge to the children. If the child doesn't get it, I think we take that as a reflection on our teaching, but with Certified Learning, the knowledge is laid out, so the teacher truly can go in as a facilitator and as a guardian, and as someone who lifts up that student, so I think that's a reason why we see a change in the relationship between the teacher and the student.

Several of the teachers commented that CLK had improved student-student relationships. They noted an increase in the students' appreciation for each other's learning differences. A teacher responded, "I'm asking him now to do what he can do, and not telling

him to do what everyone else is doing. I know he's doing what he needs to do. They know too, and they're okay with that." Another teacher replied, "They have a healthy competition as they want to do the next level . . . but they do not have a problem with the fact that somebody else is getting to do something that they're not, and that's not typically the case with five and six year olds. All of the teachers confirmed that the structure of the program breeds collegiality among the students. Because the curriculum is laid out, the students know what comes next and that each of them will follow the sequence to achieve mastery. In summary, the teachers concluded that CLK had positively impacted both the teacher-student and student-student relationships in their classes.

Discussion and Conclusions

In summary, after one year, a major difference in the TPRI scores of students in CLK classes as compared to TRD classes was not found. The EOY summary screening results showed a minimal growth advantage (1%) of CLK classes over TRD classes. The EOY listening comprehension scores showed a moderate growth advantage (7%) in CLK classes as compared to TRD classes. Since CLK is designed to identify and remediate deficits in skills, abilities, and concepts, one can conclude that significant changes in performance on the TPRI would require longer than one year to fully develop. Kindergarten retention rates for 2006-07 offer some encouraging data. The retention rate for CLK classes was lower (4 out of 94 students or 4.3%) than that of the TRD classes (22 out of 289 or 7.6%).

Although the quantitative data were inconclusive, the qualitative data was very encouraging. Responses gathered from teacher interviews, weekly meetings, and classroom observations resulted in some interesting deductions that warrant further discussion.

First, Certified Learning provides the teacher with a profile of each student's current

state of ability development and customizes the instruction accordingly. The teachers unanimously agreed that knowing the individual learning needs of each of their students and having prescriptive support for addressing those needs has made them more effective teachers. The teachers view the continuous feedback they receive from the CLK management system and from each other in weekly meetings as an important ingredient in the students' success. Duplicating this level of support without a structured management system such as CLK's would be difficult because of the time and personnel required.

A second conclusion one can draw is that CLK facilitates a child-centered approach to teaching. All of the teachers commented that CLK has changed their philosophy of teaching, transforming them from teachers of many to teachers of one. The teachers acknowledged that they felt the freedom to teach students in developmentally appropriate ways. The three modes of instruction address all types of learners, especially concrete learners who have difficulty with abstract concepts. As a result, the students experienced success as individual learners, building a foundation for conceptual learning at their own pace, instead of the pace of the group. Student confidence and investment in learning increased as each student mastered skills. Individual episodes of mastery were celebrated by the teacher, allowing each child the opportunity to receive positive regard and encouragement from the teacher and classmates.

Additionally, CLK fosters a community of support in the classroom. The teachers noted a change in the learning culture in their classes with the addition of CLK. Student competition transformed from damaging comparisons to healthy encouragement toward individual mastery. Students demonstrated acceptance of individual differences, recognizing

responsibility for their own learning and the shared responsibility of supporting a classmate's learning.

This quality of community support was especially visible in one of the CLK classes that contained several students with special needs and some serious medical concerns. The teacher's ability to build relationships with her students and create a family atmosphere in the class provided nurturing for the students' academic as well as social and emotional needs. Two examples of this supportive environment are particularly notable.

First, the students rallied around a classmate with a serious medical concern by raising money for his family and encouraging him when he was not feeling well. They even motivated him to eat more so that he would be stronger. Next, another student with a seizure disorder was embraced and accepted by his classmates. The students knew immediately what to do if a seizure occurred, giving the student privacy and respect.

Finally, CLK provides a structure for learning that promotes student independence and investment in learning. Students learn to manage their own assignments as they individually progress through the units. Improvement in student self-control and attention to task were additional benefits of the structured learning. The real success experienced by the students resulted in a sense of self-empowerment, an essential quality for their future learning.

In summary, this chapter has sought to convey the impact of SOI Certified Learning on the classroom, the teachers, and perhaps, most importantly, the individual learning experiences of the children. I accomplished this task by observing, listening, analyzing and reflecting on the insights discovered and experienced by the administrators, teachers, and the children during this year-long pilot. A common theme permeates the teachers' feedback and

the children's response, the power of knowing and being known as an individual. The teachers unfold through their words and actions of their own transformation from a teacher of many to a teacher of one. They disclose the newfound joy of having the opportunity to know each of their students as individual little people. This joy is reflected as they teach and in their students as they transition from one learning activity to another. This common thread of joy inherent in the appreciation of the uniqueness of each person is powerfully represented in the dynamic and mutually valuing relationship observed between the teachers and each of their students.

As this chapter conveys only the beginning of the story, further exploration and examination of the journey will continue and may be the focus of further research. The anticipation of the rest of the story propels me to continue to look, listen, and communicate the purity of the truth expressed in the faces, voices, and desires of the educators and children.

Recommendations for further study include long term monitoring of the Certified Learning Kindergarten students as they progress through the primary grades. It would be especially interesting to follow and examine the development of the class that looped to Certified Learning First Grade. Finally, exploring evidence of individualized learning in traditional kindergarten classes through observations and interviews might offer some interesting comparative reflections and understandings.

CHAPTER 4

Insights and Implications

"When I approach a child he inspires in me two sentiments: tenderness for what he is, and respect for what he may become" (Louis Pasteur, BraineyMedia.com, 2008b).

In my initial search for a dissertation project, I focused on finding a topic that was both interesting and meaningful. Previous dissertations that I had read or the stories others told about their research and writing experiences influenced my perspective of the dissertation process. I expected my writing and research to focus on the data collected and the implications that would result from the tangible proof obtained. Finding an external project was not difficult. Chapter 3 chronicles this external project, the piloting of Certified Learning Kindergarten (CLK). As the project continued to develop, the difficult part was acknowledging that I actually had two projects, an external one and an internal one. This chapter relates the internal project, the narrative of my own growth and development as a person, educator, and leader. Completing the external project requires the acknowledgement and consideration of the connection between the two projects. This chapter is the culmination of that integration, at least as I know it now.

As Gasset (1961) stated,

> I am myself plus my circumstances, and if I do not save it, I cannot save myself. This sector of circumstantial reality forms the other half of my person; only through it can I integrate myself and be fully myself. (p. 104)

The External Project

After the first doctoral seminar, I began contemplating my dissertation project. My varied experiences throughout my educational career had centered on the needs of struggling students and ways to help them succeed. In the past, education's answer had been to refer such learners to special education at an early age. This strategy pre-supposed that this early intervention would prevent students from falling so far behind their peers. The idea was to remove children from a class of their peers, place them in a special education class, remediate their weaknesses, and then place them back in general education.

While this approach may sound logical, many of us did not stop to consider the impact of the message, "*There is something wrong with you because you don't learn as quickly or in the same way as your friends learn,"* on the student, on his or her peers, and on the learning process itself. Imagine being five years old and hearing this perhaps unconscious message. The struggling learner's self-concept can become negatively formulated in relation to his or her own ability to learn, and is likely passively reinforced as others' perceptions of these students change when we label and remove them from the general education classroom.

Additionally, my personal observation of this special education process from the multidimensional perspectives of teacher, diagnostician, and administrator, over the span of these students' educational careers through high school graduation, suggested the program to be ineffectual for too many students. Many of these students remained in special education classes and academically behind their peers. It seemed that the underlying learning deficiencies remained unidentified and this approach of removing students from a class of their peers was not necessarily an optimal use of time and resources for these kids.

I am a person of action and as such do not generally hesitate to wholeheartedly go after something I think is of value. Such was the case with my experience with the Structure of Intellect (SOI) Theory of Learning. As a principal and, later, as a district instructional leader, I had spent several years attending training and studying the SOI Theory of Learning Abilities. The conceptual system of SOI seemed to envelope and embrace children at the level of their individual strengths and struggles, seeking to enhance and remediate rather than label or compare. My extensive background with special education had taught me the value of individualized learning, which seemed to be foundational to the SOI Theory of Learning. Other educational initiatives from SOI that I had already implemented had been validated by improved scores on the Texas Assessment of Knowledge and Skills (TAKS) in addition to teacher, student, and parent testimonies.

At this point I began to consider the possibilities of how SOI might positively impact our high percentage of at-risk children. These considerations propelled me down the path to Certified Learning – Kindergarten (CLK). When presented with the opportunity to pilot a program that would conceptually discover and address the needs of our youngest learners, I embraced it. CLK identifies the entering student's deficits in skills, abilities, and concepts and customizes the curriculum to address the deficits.

As the pilot site, the district leadership had input into some of the specific elements of the construction of CLK. Dr. Bob Meeker, who designed CLK, incorporated the Texas Essential Knowledge and Skills (TEKS) for kindergarten into the plan. He also included the district's kindergarten report card and curriculum units in the program's development. This customization was a definite advantage for our teachers and honored their previous work and the work of their colleagues.

In this chapter, I will focus on the insight I gained from the teachers participating in the study. When I initially analyzed the data, I concentrated on the children's response to CLK. As I integrated the impressions from the observations, interviews, and weekly meetings and shared these interpretations with the stakeholders and other researchers, I realized that CLK was working *because* of the teachers. In fact, I believe that most programs will work if great teachers are involved. The key is not the program, but the teachers and their relationships to each child in their class. Can some programs or initiatives make that easier? The answer is definitely yes, but it is not the program that is the panacea; the critical resource is the teacher and the love he or she has for each of their students. My experience with these five teachers affirms this truth for me.

The primary message that these five teachers have communicated to me is the joy and fulfillment they have experienced in identifying the individual needs of each of their students and, in turn, knowing how to meet those needs. CLK provides a means for accomplishing this mission through data management and prescriptive individual educational plans. It is the teacher; however, who provides the link to the child. The following words from Quintilian in 70 A. D. are evidence that the wisdom of this approach to education has been known for a very long time:

> It is generally and rightly considered a virtue in a teacher to observe accurately the differences in ability among his pupils, and to discover the direction in which the nature of each particularly inclines him. There is an incredible amount of variability in talent, and the forms of minds are no less varied than the forms of bodies. (Eysenck, 1979, p. 1)

The Internal Project

Interwoven in the pages of the story of piloting CLK is the story of my own growth and development as a person, as an educator, and as a leader. It was the most difficult part of the story for me to write until Dr. Sacken gave me the encouragement to look beyond the results of the project to the reason for choosing the project, the process of growth experienced through the project, and the insight gained from the experience. I have already written about the reasons for choosing the project in chapter 1 and in the first section of chapter 4. The focus will now be on the process and the insights.

I always struggle when I write because real writing involves revealing a part of yourself that perhaps you would rather keep hidden. Unfortunately, that is the way growth happens. It is painful and freeing all at the same time. I am reminded of the words that O'Connor (1985) said about the process of writing: "I have to write to discover what I am doing. I don't know as well what I think until I see what I say; then I have to say it over again" (p. 9).

I still recall as a child how it felt to look at the words on a page and have no idea how to read them. I remember feeling afraid that someone would find out that I could not sound out the words. I am thankful for that experience because it allows me to understand what my struggling students go through. My compassion for struggling students is one of the results of that early childhood experience. Since that time, I have learned that I was not unintelligent; I was unconnected to learning. My connection to learning came in part through the relationship of a caring teacher.

I believe that a primary purpose in my life is to bring about connections to learning for others. In my experience, the key component to making a connection to learning is an

authentic and valuing relationship. That is true for students, especially struggling students, and it is true for teachers and other educators. This personal experience of connecting to learning parallels what I observed in the Certified Learning Kindergarten classes. The culture of support present in the weekly meetings with the CLK teachers was multiplied in the classrooms of these teachers. In essence, the support was passed on.

When considering the impact of this study, it is important to take into consideration what most school leaders are looking for when evaluating program effectiveness. Because of the increasing demands of the assessment system, the priority for a "quick fix" program is almost unrelenting. Educators tend to look for programs that will quickly bring up test scores, sometimes not considering the long-term effect on the child's conceptual learning. While strong tests results are important, the child's ability to transfer the learning is paramount to his or her future success as a learner.

As a teacher of students identified with learning disabilities, I daily confronted students who had no conceptual framework in place that would facilitate their retention of information or development as learners. The learning was not meaningful to them and it was as if their learning started over every day. My experience as a diagnostician and administrator affirms that many students with learning disabilities stay in a holding pattern despite the special intervention we provide them. Our duty, as educators, is to question why students fall into this pattern and find ways to help them break out of it.

In defining the parameters of this study, I intended to provide quantitative data (TPRI scores) that supported CLK and qualitative data that told the story of the children's response to CLK. The response that I did not fully anticipate was that of the teachers. As a

superintendent, I must evaluate all aspects of an initiative and inform other educators of all of the data, that when integrated, will reveal the whole story.

From a researcher's viewpoint, the quantitative data were not conclusive. Immediately, the administrative question arises: Do you continue the initiative? As a superintendent, I must consider the financial cost of training, materials, and personnel when implementing or continuing a program. Realizing the enormous pressure on educational leaders to make informed and thoughtful decisions, I felt compelled to provide all of the data I collected, including the information one often does not read about in program evaluations. I asked myself, what information as a superintendent would I want to know before making a commitment to CLK? Immediately, my response was: How were kids and teachers affected, and what were the resulting implications for the district and for my responsibilities as the educational leader?

Chapter 3 details the students' and teachers' responses; thus, the following section discusses the implications resulting from the research for the district including the next steps for Certified Learning, and the implications for me as the district's leader.

District Implications

The first implication from the research was that teachers and students highly valued customized and individualized instruction. The teachers appreciated the continual learning offered to them by the feedback of the SOI Management System and by each other in weekly meetings. As the district's instructional leader, I want other teachers who are not involved in CLK to learn how to integrate the concept of individualized instruction into their classes.

One way to accomplish this goal is through professional development that equips teachers with the knowledge to assess and provide differentiated instruction to their students.

In the district staff development survey, 79% of the teachers and administrators listed increasing their understanding of differentiated instruction as a priority for professional development. The district's professional development academy, currently under construction for the next school year, will have differentiated instruction as one of its focal points.

Another initiative, the district's Response to Intervention (RTI) Plan, is a multi-tiered approach designed to help all students experience success. As part of the plan, struggling students receive the SOI Test of Learning Abilities to target the underlying cause of their academic struggles, the underdeveloped abilities. After this assessment, a team of educators meets and develops an intervention plan that provides resources for the student that addresses the identified underdeveloped abilities. One of the most significant results of this focus on individualized instruction seems to be a deeper awareness among many of the district's educators that not all struggling students need to be referred to special education. In fact, the district's referral rate decreased from 4.6% in 2006-07 to 1.5% in 2007-08. In the 2006-07 CLK classes, no students were referred to special education. Are all of the district's educators at that point? No, but there is definitely an increased confidence level that most students can succeed in the general education classroom with the appropriate support. Professional development addressing RTI will be another area of concentration at the professional development academy.

Another implication from the research, student independence and investment in the learning process, is being enhanced through the district's approach to curriculum and instruction. The district's vertical and horizontal alignment teams have developed a concept-based curriculum that focuses on deep and meaningful learning. This method of curriculum

and instruction is giving the students a framework for internalizing their learning, thus increasing their investment in the learning.

For example, teams of teachers have developed concept-based units that spiral through the grade levels. The concept remains the same, but the topic changes. For example, the concept of cooperation may be taught in kindergarten through the unit theme of families, in grade four through the unit theme of states, and in grade seven through the unit theme of countries. This coherence across the curriculum teaches students to think conceptually.

In addition, in the CLK classes, the concept of individual mastery significantly influenced the student's investment in their learning. As the students achieved mastery, the teachers celebrated the successes with their students. Teaching and encouraging all district educators to celebrate the individual achievements of their students is one way to extend this implication of the study.

The third implication of CLK, a child-centered approach to teaching, changed the teaching philosophy of the teachers involved. They found structure in the conceptualization of SOI and a sense of purpose in recognizing and honoring the individual learning systems of each child. The teachers expressed personal satisfaction from helping the students learn how to learn. The teachers' words and actions confirmed their joy in teaching these individual learners. One of the CLK teachers wonderfully expressed the joy of teaching in her professional biography, submitted as part of her teacher of the year application:

> Some of my greatest accomplishments are being nominated for Disney's American Teacher Awards, twice nominated for the Marva Collins Award, and twice awarded campus teacher of the year. I am proud of these honors, but the one I hold nearest to my heart is knowing that I reach my students with love through Certified Learning.

> This was a pilot program from SOI that was only offered to five kindergarten teachers in the United States . . . . I feel privileged to be associated with an outstanding team of teachers, my assistant, and administrators. All involved exemplified respect, kindness, and compassion for learning. This experience has touched me and changed my teaching. Certified Learning allows each child to demonstrate mastery in three components – individual computer, workbook, and group instruction. Through this program, I am able to provide an individualized learning environment. It allows me to know each student personally, as well as academically. Children that were labeled "at-risk" are now achieving academic success and they show ownership for their education. They thrive on the structure and security that the program provides. So much so, that they didn't want to stop Certified Learning to take part in a well deserved party. Along with this pilot program came the many observations and encouraging words from teachers, administrators, and Dr. Bob Meeker. Their praise for my students would be the highest form of compliment I could receive.

As a superintendent, I am aware of the pressure that standards-based education puts on educators, especially teachers. It is easy to get caught up in test scores and forget that we are about the more complex business of guiding children's development. As the district's instructional leader, I have the responsibility to balance the duty to perform on assessments with the commitment to make the learning process about honoring the individual learning system of each child. Interestingly, the public authenticated this view in a Gallup Poll Survey (as cited in Thompson, 2008) regarding the public's attitudes about public schools. Eighty-six percent of the respondents said that a school's performance should be based on

improvement, rather than a snapshot test and 83% of parents think "teaching to the test" is a bad thing, up from 58% in 2003.

Finally, a fourth implication is that CLK fosters a community of support. James Comer (as cited in Payne, 2008) said it this way: "No significant learning occurs without a significant relationship" (p. 48). Students know when a teacher's intent is to help them experience success. The support of a teacher and classmates is often the bridge that facilitates the student's crossing into the role of a learner. A sense of order, motivation, and positive regard for every student works systematically to produce a healthy climate for learning. As a result, one of the primary goals of the 2008-09 district improvement plan is to provide a positive environment that fosters invested community members. The members of the District Planning Committee collaborated to construct several district wide strategies to promote a community of support for students and teachers.

I believe establishing, maintaining, and enriching an atmosphere of trust and collaboration with district and campus administrators provides the foundation for this community of support. Since this type of culture seems to flow from the top down, it is my job to model and effectively communicate how I would like to see each of the district's administrators value teachers by getting to know them as individuals, establishing clear and reasonable expectations, expressing appreciation for their work, providing honest evaluations, empowering them through training, and providing them opportunities for personal growth whenever possible. It is my hope that this attitude of value, rather than self-interest, will filter down through the district administrators, through the teachers, and to the students. This summer the district's principals and other leaders will participate in a retreat designed to facilitate the building of meaningful relationships.

The significance of the teacher-student relationship sent me back to the literature. I discovered that other research supports the significance of the teacher-student relationship. Rogers (1983) summed up the teacher-student relationship this way:

> Perhaps the most basic of these essential attitudes is realness or genuineness. When the facilitator is a real person, being what she is, entering into the relationship with the learner without presenting a front or façade, she is more likely to be effective….There is another attitude that stands out in those who are successful in facilitating learning….I think of it as prizing the learner, prizing his/her feelings, his/her opinions, his/her person….It is an acceptance of this other individual as a separate person, having worth in his/her own right. A further element that establishes a climate for self-initiated, experiential learning is empathetic understanding. When the teacher has the ability to understand the student's reactions from the inside, has a sensitive awareness of the way the process of education and learning seems *to the student*, then again the likelihood of significant learning is increased. (pp. 121-125)

Combs (1965) taught that teachers should be sensitive, trusting, confident, and versatile. In *Human Teaching for Human Learning,* Brown (1971) explained the concept of *confluent education* in which there is "a flowing together of affective and cognitive elements in individual and group learning" (p. 4). He stated, "It should be apparent that there is no intellectual learning without some sort of feeling, and there are no feelings without the mind's being somehow involved" (p. 4).

Gordon (1974) in his book *Teacher Effectiveness Training* emphasized the importance of a favorable teacher-student relationship. Purkey (1978) advocated that teachers develop and use an approach called "invitational learning." He defines an invitation

as “a summary description of messages – verbal and nonverbal, formal and informal – continuously transmitted to students with the intention of informing them that they are responsible, able, and valuable” (p. 3).

A strategy currently in place in the district to teach the significance of the teacher-student relationship is the Capturing Kids’ Heart (CKH) Program (Flippen, 2004). Approximately 300 educators of the nearly 800 district employees have received training in CKH and an additional 100 will receive training this summer.

Other programs for teaching educators how to convey positive regard and value to students are also being considered. Providing teachers resources to help guide the development of positive teacher-student relationships that facilitate learning is a district priority. Programs and initiatives will be evaluated on the basis of their ability to advance the capacity of the district to demonstrate the principle of valuing and building meaningful and caring relationships.

Next Steps for Certified Learning

CLK is in its second year in the five kindergarten classes and Certified Learning First Grade was piloted this year in five first grade classes. In the 2008-09 school year, the district will pilot Certified Second Grade. Throughout the process, the teachers have continually provided feedback to the SOI Management Team about concerns with technology, the sequence of skills, or the need for more units in key areas. One example of this feedback was the teachers’ assessment of the necessity for more phonics instruction in the beginning of first grade. The progress of the students’ reading development as compared to the progress of their math development concerned the teachers. To address the teachers’ concern, the SOI Management Team will add units to the workbook instruction that incorporate the first grade

sight words and the computer units will integrate more phonics instruction at the beginning of the year.

Next year, the kindergarten and first grade curriculum will be accessible in both grade levels to facilitate an even more individualized approach to student learning. If a kindergarten student completes CLK, the teacher will have the discretion to allow the student to proceed to the Certified First Grade Curriculum. Conversely, the first grade teachers will have the Certified Learning Kindergarten Curriculum available to use with a struggling first grade student. The availability of both curriculums will provide an alternative to retention.

In preparation for the increased academic demands in third grade, Certified Second Grade will incorporate the SOI Test of Learning Abilities for each student. Based on the assessment data, the students will receive an individualized workbook that addresses their learning deficits. The computer instruction will include all of the words from the second grade sight word list, additional blending exercises, and the concept of multiplication and division. Teacher and principal involvement in customizing the curriculum will occur at more frequent intervals to ensure that student academic needs are being addressed.

Parental interest in Certified Learning continues to increase. One elementary school has received so many parent requests for CLK that they have requested a second class for the 2008-09 school year. Parents shared positive feedback at a district-wide Certified Learning informational meeting. Some of the teachers invited parents to visit the classroom and watch their children in each mode of instruction. The teachers testified that the class visit helped the parents to better understand Certified Learning. Next year, all of the Certified Learning teachers will host these parent workshops.

Through collaboration with the teachers and principals, I will continually evaluate Certified Learning's impact on the learning development of the students in the program. Frequent assessments will afford us the opportunity to make adjustments as needed to best address student needs.

Implications for My Leadership

My experience with CLK confirms my three life assumptions, as explained in Chapter One. First, all children are natural learners. I observed this phenomenon daily in the CLK classes and heard testimonies of it from the teachers. I witnessed the satisfaction of the students as they experienced personal success and realized the joy of being a learner.

Second, the best learning takes place in the context of a meaningful and valuing relationship. The relationship, the link between the teacher and each individual child, was a significant part of the success of CLK. I have always believed that at their core all children want to love and be loved. As the teachers expressed the grace that flows via love to these children, many of the obstacles that inhibit learning were removed. Without the teachers' caring investment, no program will be impactful.

Finally, meaningful and valuing relationships produce a pleasurable sense of joy in the hearts of those authentically involved. I observed this joy in the teachers and students as the classrooms became communities of support that facilitated the learning process.

The long-term themes of my life are grounded in these beliefs. When looking back through the chapters of my life, I have not given up my identity with my changing roles. In truth, my faith remains at the core of my being and infuses the ways in which I have connected people, connected programs, and connected purpose. The education and career

path I have walked thus far has allowed me to experience many connections. Each one has added to my life.

It would seem that this experience with CLK was consistent with these three life assumptions that I value. In other words, the process of development experienced with the external project of piloting CLK respected and nurtured the internal project, the growth of my inner self. What this study has affirmed for me is the uncompromising value and benefit of respecting all that the individual child brings to the learning situation. SOI Certified Learning Kindergarten (CLK) is simply a tool for facilitating this process. Are there other tools? Yes, but the true value lies not in the tool, but in the understanding.

In closing, this study confirmed the value of individualizing learning to meet the diverse needs of students and supported the belief that most students can succeed in the general education classroom. As well, meeting the needs of students and teachers requires a multi-faceted approach that is connected by guiding principles that have at the core a meaningful and valuing relationship. In truth, the process and implications of this study are both a result and fulfillment of the values central to my identity as a leader, educator, and person.

The potential impact of this finding for the district's students and teachers is so powerful and compelling that it will require my personal focus and public commitment. As the district's educational leader, my mission is to empower, equip, and encourage teachers to facilitate the individual growth and development of their students. It is my job to build hope and joy in classrooms for all involved. Yet hope and joy are a manifestation of the fruit of love, which cannot be taught, but must be caught. Formal education can either be a nurturing or inhibitive influence on the developing learning abilities of children based on how these

natural learners are valued and loved. I have come to accept that once children regard themselves as loveable, then they are more readily teachable. In observing the teachers and students during this study, I have discovered that love may very well be the greatest common denominator in learning (Arnold, 2007) not so much as a motivator, but rather as a state of being, and certainly a disinhibitor. As a leader, I hope the expression of that love to teachers and staff is contagious and experienced by students every day in the classroom.

Leader's Creed

Each student is a natural learner with preferred learning styles, individual talents, and gifts. The teacher serves as an important catalyst in the learning process which involves direction, explanation, motivation, and evaluation within the context of a dynamic relationship. The principal's function is inclusive of the collaborative development of a shared vision, the advancement of a sound instructional program for all learners, and the facilitation of personal and professional growth. Additionally, the principal is in the unique position to facilitate a school climate which fosters a sense of order, trust, community, and belonging, while providing a risk free environment in which reluctant members can express fear and doubts, receive encouragement, and stretch beyond prior limitations.

The leadership of the superintendent is serving, building, and nurturing a district climate and school community in which students, families, and educators can grow in character, confidence, and achievement.

Audrey Marie Parker Arnold

APPENDIX A

Certified Learning Kindergarten Parent Letter

White Settlement ISD

To educate and inspire all students to excel in society

Dear Parent(s) or Guardian,

White Settlement ISD is dedicated to teaching the art of learning to its youngest students. We are excited to announce a new program; Certified Learning Kindergarten, designed to address the unique needs of the kindergarten student. Certified Learning Kindergarten operates on the belief that effective learning for young students occurs after a particular set of concepts and skills are developed and acquired. These concepts and skills are mastered through experiences focused on the cognitive, visual, auditory, and kinesthetic processes.

The Kindergarten Certified Learning Program was developed by the Structure of Intellect Systems (SOI). WSISD is currently using other programs developed by SOI Systems such as Learning Discovery, Bridges Lab and Math Prep. White Settlement ISD has been chosen as the only district in the nation to pilot the SOI Certified Learning Kindergarten Program. The program will be implemented in one kindergarten pilot classroom in each elementary school including the Fine Arts Academy. Your child has received the opportunity for membership in this classroom.

The structure of the Certified Learning Program is based on the belief that children learn in a variety of modalities at their own pace. It features individualized instruction in small groups through the use of computers, workbooks and physical activities. Every step of instruction empowers the students to be independent enough to work at their own pace, developing concept formations which lead to mastery of academic objectives listed in the Texas Essential Knowledge and Skills for Kindergarten (TEKS).

We believe that all students in the district will benefit from the implementation of this program. Teachers will have the benefit of frequent discussion and weekly feedback with the designer of this program, Dr. Robert Meeker, and with the research scientists who participated in its development. These interactions will be shared with other district educators, thus adding to our knowledge base of how young children learn.

Progress toward the mastery of academic objectives will continue to be recorded on the kindergarten report card. **Due to your child's enrollment in the certified learning program, his/her report card will reflect assessments as conducted throughout the year, not necessarily in order according to the current six weeks.** This change is a reflection and blending of the order in which these skills are assessed through Certified Learning and classroom curriculum. However, all concepts and skills presented on the report card will be taught and assessed during your child's school year and report cards will be sent home at the end of every six weeks in addition to the individual certified learning progress report.

The Certified Learning Kindergarten Program supports the established history of White Settlement ISD in identifying and serving the needs of its growing community of young learners.

Sincerely,

Audrey Arnold
Deputy Superintendent

APPENDIX B

Permission to Include Materials from the Structure of Intellect Model (SOI)
and Certified Learning Curriculum

Robert Meeker
SOI Systems
PO Box D, 45755 Good Pasture Rd.
Vida, Oregon 97488

April 1, 2008

Dear Dr. Meeker,

I am a superintendent in the State of Texas, and am currently working on my doctoral dissertation at Texas Christian University.

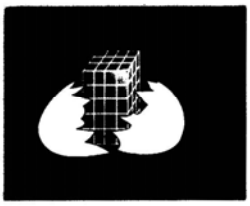
This study is seeking to examine the effects of SOI Certified Learning on the academic development of the students in five kindergarten classes in the district. The title of the study is *The Influence of Respecting the Individual Child's Learning System on Early Academic Development.*

The purpose of this correspondence is to request your permission to include charts, diagrams, and other materials from the Structure of Intellect (SOI) Model and Certified Learning Curriculum in the appendix and body of my research.

I appreciate your consideration regarding this matter and look forward to hearing from you.

Sincerely,

Audrey Arnold
Superintendent, WSISD



SOI Systems ™

P.O. Box D
45755 Goodpasture Road
Vida, OR 97488

541-896-3936

6 April 2008

To: Ms. Audrey Arnold
Superintendent, WSISD
White Settlement Independent School District
White Settlement, TX

From: Robert Meeker, President

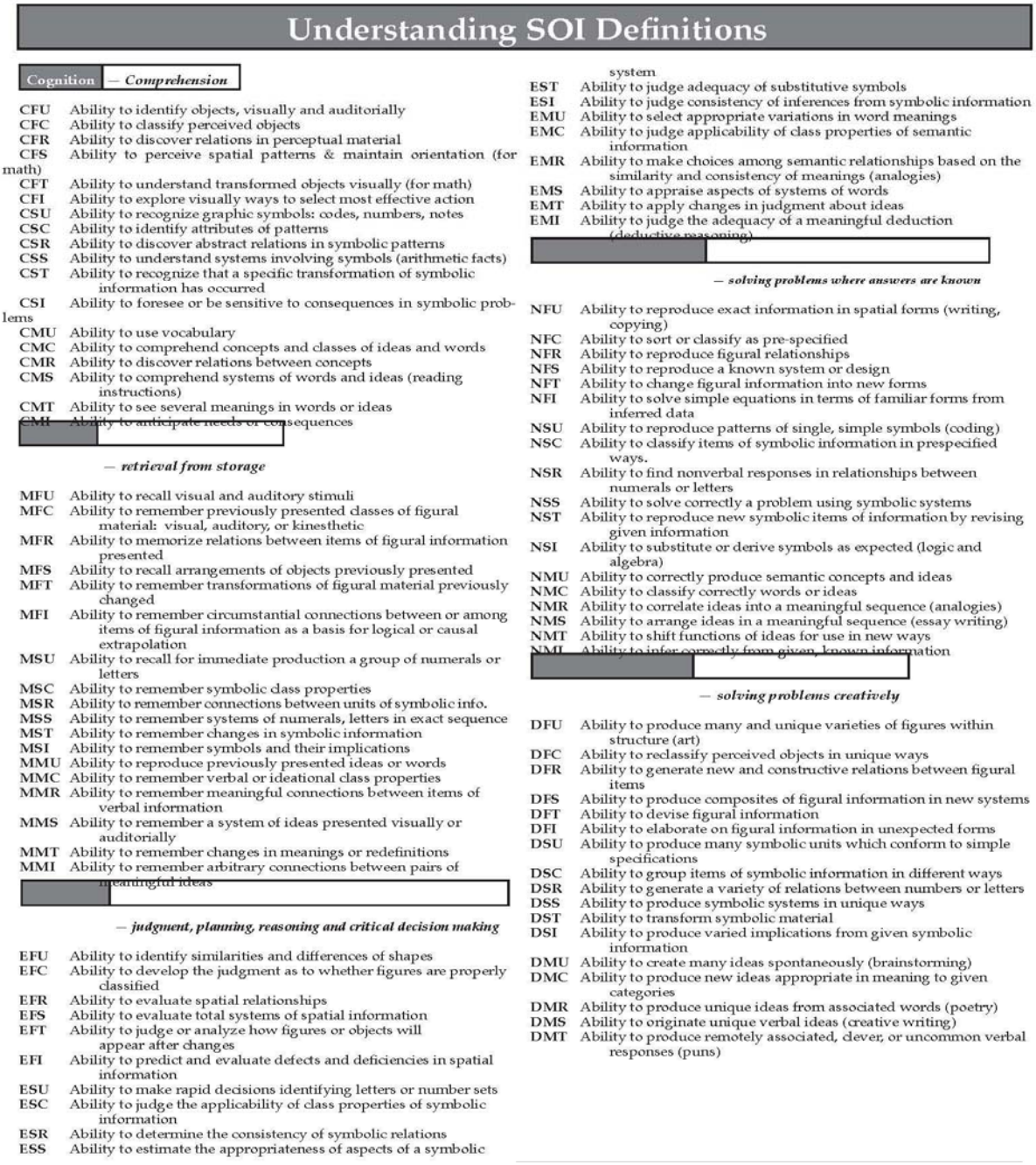
Responding to your request to have our permission to include charts, diagrams, and other materials from the Structure of Intellect (SOI) Model and Certified Learning Curriculum for inclusion in you dissertation, titled: *The Influence of Respecting the Individual Learning System of the Child on Academic Readiness*, we hereby grant you permission to reproduce and incorporate the materials as described in your request.

Further, we are honored to be a part of your advanced educational achievements.

Robert Meeker

APPENDIX C

Understanding SOI Definitions



Understanding SOI Definitions

Cognition — *Comprehension*

- **CFU** Ability to identify objects, visually and auditorially
- **CFC** Ability to classify perceived objects
- **CFR** Ability to discover relations in perceptual material
- **CFS** Ability to perceive spatial patterns & maintain orientation (for math)
- **CFT** Ability to understand transformed objects visually (for math)
- **CFI** Ability to explore visually ways to select most effective action
- **CSU** Ability to recognize graphic symbols: codes, numbers, notes
- **CSC** Ability to identify attributes of patterns
- **CSR** Ability to discover abstract relations in symbolic patterns
- **CSS** Ability to understand systems involving symbols (arithmetic facts)
- **CST** Ability to recognize that a specific transformation of symbolic information has occurred
- **CSI** Ability to foresee or be sensitive to consequences in symbolic problems
- **CMU** Ability to use vocabulary
- **CMC** Ability to comprehend concepts and classes of ideas and words
- **CMR** Ability to discover relations between concepts
- **CMS** Ability to comprehend systems of words and ideas (reading instructions)
- **CMT** Ability to see several meanings in words or ideas
- **CMI** Ability to anticipate needs or consequences

— *retrieval from storage*

- **MFU** Ability to recall visual and auditory stimuli
- **MFC** Ability to remember previously presented classes of figural material: visual, auditory, or kinesthetic
- **MFR** Ability to memorize relations between items of figural information presented
- **MFS** Ability to recall arrangements of objects previously presented
- **MFT** Ability to remember transformations of figural material previously changed
- **MFI** Ability to remember circumstantial connections between or among items of figural information as a basis for logical or causal extrapolation
- **MSU** Ability to recall for immediate production a group of numerals or letters
- **MSC** Ability to remember symbolic class properties
- **MSR** Ability to remember connections between units of symbolic info.
- **MSS** Ability to remember systems of numerals, letters in exact sequence
- **MST** Ability to remember changes in symbolic information
- **MSI** Ability to remember symbols and their implications
- **MMU** Ability to reproduce previously presented ideas or words
- **MMC** Ability to remember verbal or ideational class properties
- **MMR** Ability to remember meaningful connections between items of verbal information
- **MMS** Ability to remember a system of ideas presented visually or auditorially
- **MMT** Ability to remember changes in meanings or redefinitions
- **MMI** Ability to remember arbitrary connections between pairs of meaningful ideas

— *judgment, planning, reasoning and critical decision making*

- **EFU** Ability to identify similarities and differences of shapes
- **EFC** Ability to develop the judgment as to whether figures are properly classified
- **EFR** Ability to evaluate spatial relationships
- **EFS** Ability to evaluate total systems of spatial information
- **EFT** Ability to judge or analyze how figures or objects will appear after changes
- **EFI** Ability to predict and evaluate defects and deficiencies in spatial information
- **ESU** Ability to make rapid decisions identifying letters or number sets
- **ESC** Ability to judge the applicability of class properties of symbolic information
- **ESR** Ability to determine the consistency of symbolic relations
- **ESS** Ability to estimate the appropriateness of aspects of a symbolic system
- **EST** Ability to judge adequacy of substitutive symbols
- **ESI** Ability to judge consistency of inferences from symbolic information
- **EMU** Ability to select appropriate variations in word meanings
- **EMC** Ability to judge applicability of class properties of semantic information
- **EMR** Ability to make choices among semantic relationships based on the similarity and consistency of meanings (analogies)
- **EMS** Ability to appraise aspects of systems of words
- **EMT** Ability to apply changes in judgment about ideas
- **EMI** Ability to judge the adequacy of a meaningful deduction (deductive reasoning)

— *solving problems where answers are known*

- **NFU** Ability to reproduce exact information in spatial forms (writing, copying)
- **NFC** Ability to sort or classify as pre-specified
- **NFR** Ability to reproduce figural relationships
- **NFS** Ability to reproduce a known system or design
- **NFT** Ability to change figural information into new forms
- **NFI** Ability to solve simple equations in terms of familiar forms from inferred data
- **NSU** Ability to reproduce patterns of single, simple symbols (coding)
- **NSC** Ability to classify items of symbolic information in prespecified ways.
- **NSR** Ability to find nonverbal responses in relationships between numerals or letters
- **NSS** Ability to solve correctly a problem using symbolic systems
- **NST** Ability to reproduce new symbolic items of information by revising given information
- **NSI** Ability to substitute or derive symbols as expected (logic and algebra)
- **NMU** Ability to correctly produce semantic concepts and ideas
- **NMC** Ability to classify correctly words or ideas
- **NMR** Ability to correlate ideas into a meaningful sequence (analogies)
- **NMS** Ability to arrange ideas in a meaningful sequence (essay writing)
- **NMT** Ability to shift functions of ideas for use in new ways
- **NMI** Ability to infer correctly from given, known information

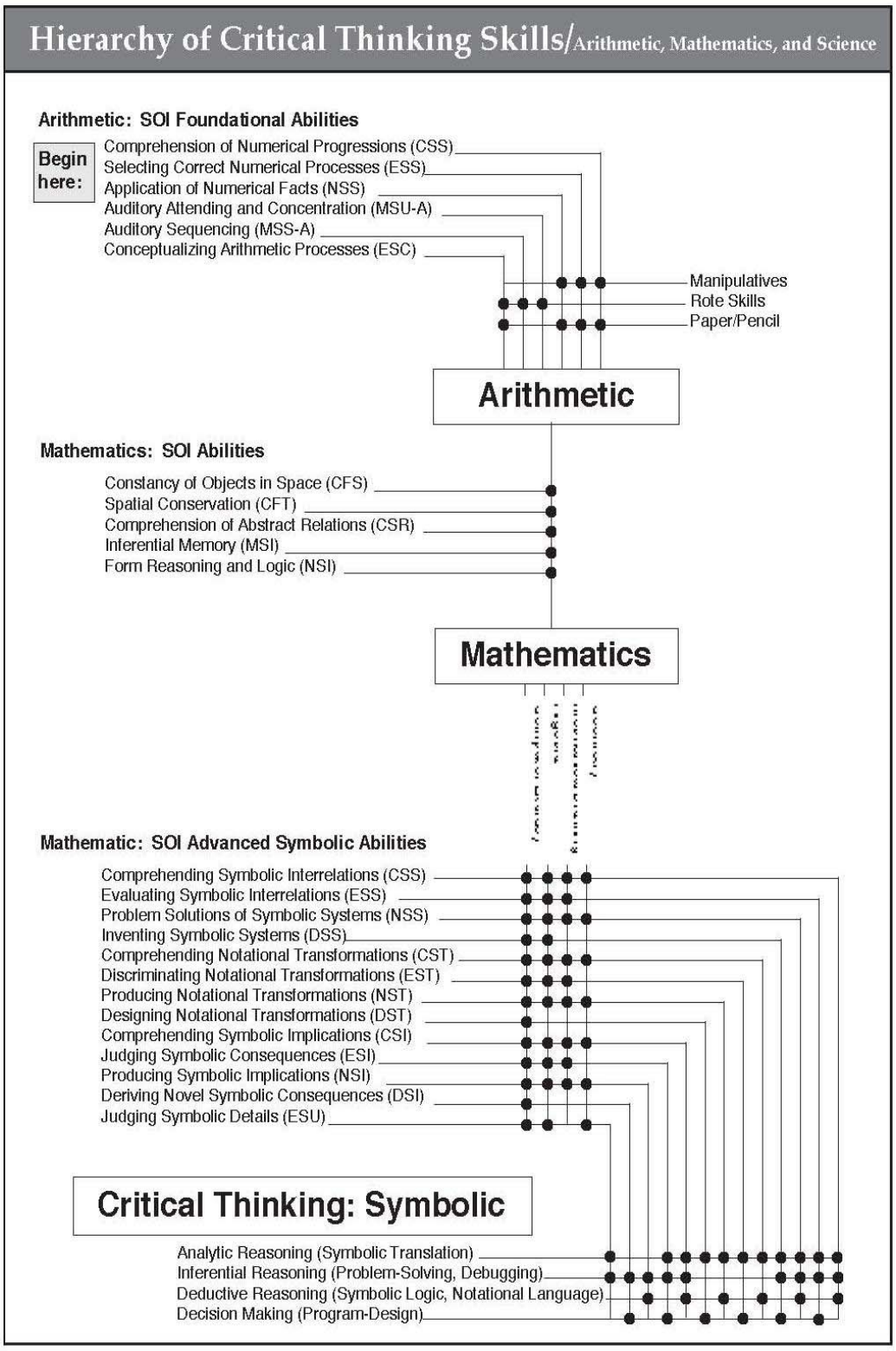
— *solving problems creatively*

- **DFU** Ability to produce many and unique varieties of figures within structure (art)
- **DFC** Ability to reclassify perceived objects in unique ways
- **DFR** Ability to generate new and constructive relations between figural items
- **DFS** Ability to produce composites of figural information in new systems
- **DFT** Ability to devise figural information
- **DFI** Ability to elaborate on figural information in unexpected forms
- **DSU** Ability to produce many symbolic units which conform to simple specifications
- **DSC** Ability to group items of symbolic information in different ways
- **DSR** Ability to generate a variety of relations between numbers or letters
- **DSS** Ability to produce symbolic systems in unique ways
- **DST** Ability to transform symbolic material
- **DSI** Ability to produce varied implications from given symbolic information
- **DMU** Ability to create many ideas spontaneously (brainstorming)
- **DMC** Ability to produce new ideas appropriate in meaning to given categories
- **DMR** Ability to produce unique ideas from associated words (poetry)
- **DMS** Ability to originate unique verbal ideas (creative writing)
- **DMT** Ability to produce remotely associated, clever, or uncommon verbal responses (puns)

Note: From *An Interpretation Guide with Strategies for Using SOI*, p.124, by M. Meeker, 2000, Vida, OR: SOI Systems. Copyright 2000 by Mary Meeker. Reprinted with permission of Robert Meeker.

APPENDIX D

Hierarchy of Critical Thinking Skills/ Arithmetic, Mathematics, and Science



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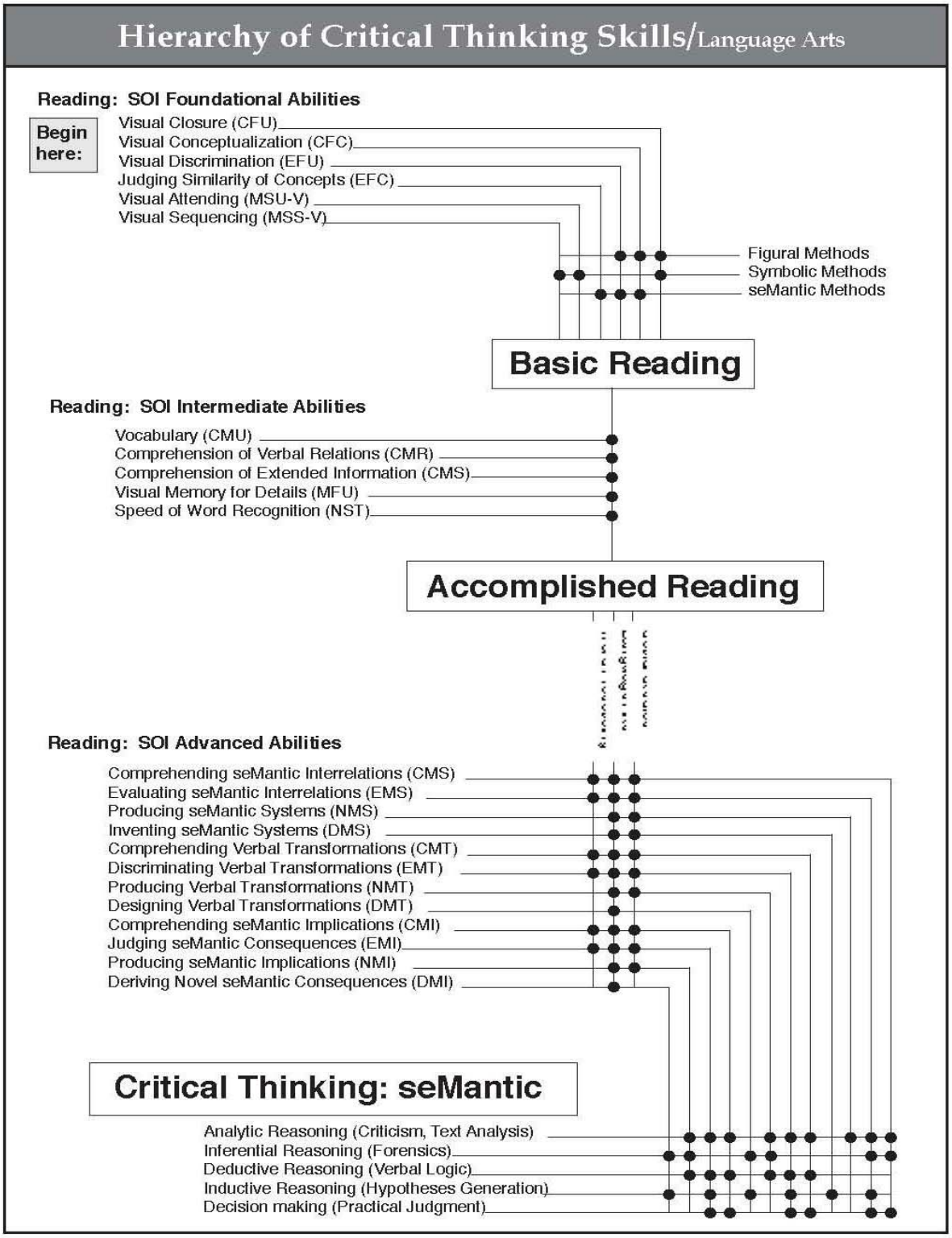
APPENDIX E

Hierarchy of Critical Thinking Skills/Language Arts



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APPENDIX F

Structure of Intellect Model Related to Curriculum

Structure of Intellect Model Related to Curriculum

Comprehension (Cognition) = C

Cognition (C)—general ability to assimilate and/or recognize material; understanding information presented in lectures, reading, instructions, directions, etc.

Figural Content	Symbolic Content	seMantic Content
Visual Closure CFU **Basic Reading**	Number/Letter Recognition CSU **Arithmetic**	Vocabulary CMU ∞ **Language Arts**
Concept Formation CFC **Basic Reading** **Basic Science**	Numerical Concepts CSC **Arithmetic**	Concept Acquisition CMC **Foreign Language** **Language Arts, Science**
Spatial Relations CFR **Mathematics** **Geography**	Numerical Relations CSR **Mathematics** **Word Processing**	Analogical Reasoning CMR **Language Arts** ∞
Spatial Reasoning CFS **Basic Mathematics** • **Physics**	Numerical Sequencing CSS **Arithmetic** **Mathematics**	Verbal Sequencing CMS **Language Arts** ∞ **Social Sciences**
Spatial Transformations CFT **Higher Level** • **Mathematics**	Symbolic Transformations CST **Mathematics** **Word Processing**	Verbal Transformations CMT **Language Arts** ∞ **English**
Figural Implications CFI • **Geometry**	Theorem Implications CSI **Mathematics** **Word Processing**	Verbal Implications CMI * **Logic** ∞ **Forensics**

Memory = M

Memory (M)—general ability to recognize or recall information that has been previously cognized and stored.

Figural Content	Symbolic Content	seMantic Content
Figural Detail Recall MFU **Basic Reading**	Symbolic Detail Recall MSU **(visual) Reading** **(auditory) Arithmetic**	Word Recall MMU **Reading**
Figural Concept Recall MFC **Geometry**	Symbolic Concept MSC **Arithmetic/Math** **Programming**	Verbal Concepts MMC **Language Arts**
Spatial Relations MFR **Geometry**	Symbolic Relations MSR **Arithmetic/Math** **Programming**	Verbal Relations MMR **Social Sciences** ∞ **Language Arts**
Figural Systems Recall MFS **Geometry** **Geography**	Sequencing MSS ∞ **Math/Logic** **Programming**	Verbal Sequencing MMS **Performing Arts** ∞ **Language Arts**
Spatial Transformation Recall MFT **Mechanical Drawing**	Transformations MST **Science** **Math/Logic** ∞ **Programming**	Verbal Transformations MMT **Science** **Language Arts**
Spatial Implications Recall MFI **Geometry** **Mechanical Drawing**	Symbolic Implications MSI ∞ **Math/Logic** **Programming**	Verbal Implications MMI ∞ **Language Arts**

Evaluation (Critical Thinking for Decision Making) = E

Evaluation (E)—general ability to do critical, analytical reasoning and to reduce ambiguity or absorb uncertainty about information or circumstances presented.

Figural Content	Symbolic Content	seMantic Content
Visual Discrimination EFU **Spelling** **Reading**	Notational Discrimination ESU **Spelling** **Reading**	Connotation Discrimination EMU # **Logic/Language Arts**
Attributes and Concepts EFC **Reading** **Science**	Symbolic Concept Discrimination ESC **Mathematic** **Logic**	Concept Discrimination EMC # **Language Arts**
Spatial Relations EFR **Mechanics**	Judging Symbolic Relations ESR **Arithmetic/Math** **Logic**	Evaluating Relational Concepts EMR **Language Arts**
Spatial Systems EFS **Mechanics** **Art**	Evaluating Symbolic Systems ESS **Arithmetic/Math** ∞ **Logic**	Evaluating seMantic Concepts EMS ∞ # **Language Arts**
Spatial Perspectives EFT **Art** **Science**	Formulae Transform Codes & Computers EST **Math**	seMantic Transformations EMT * **Language Arts** # **Forensics**
Spatial Consequences EFI **Art** **Science**	Symbolic Problem Solving ESI **Math/Logic**	seMantic Implications Judgment EMI ∞ # **Language Arts** * **Science**

Divergent (Creative Thinking) = D

Divergent Production (D)—general ability to find original, unfamiliar, unconventional, and innovative solutions or determine new courses of action using previously understood material.

Figural Content	Symbolic Content	seMantic Content
Spatial Fluency DFU **Visual Arts**	Symbolic Fluency DSU **Programming**	Verbal Fluency DMU **Language Arts**
Spatial Conceptualization DFC **Visual Arts**	Symbolic Conceptualization DSC **Math/Logic Programming**	Verbal Conceptualization DMC **Language Arts**
Figural Association DFR **Visual Arts**	Symbolic Association DSR **Programming Math/Logic**	Verbal Association DMR **Language Arts**
Figural Systemization DFS **Geometry/Math**	Symbolic Systemization DSS **Logic/Math Science**	Verbal Systemization DMS + **Language Arts**
Figural Transformations DFT + **Performing Arts Geometry/Math**	Symbolic Transformations DST **Logic/Math Science**	seMantic Tranformations DMT + **Language Arts Poetry/Humor**
Figural Inferences DFI + **Visual Arts Science**	Symbolic Inferences DSI **Logic/Math Science**	seMantic Inferences DMI + **Humor/Logic Science**

coNvergent (Problem Solving) = N

coNvergent Production (N)—general ability to find solutions or determine course of action using familiar principles, rules, or procedures.

Figural Content	Symbolic Content	seMantic Content
Figural Reproduction NFU **Basic Reading Writing**	Symbolic Reproduction NSU **Reading/Arithmetic Word Processing**	Verbal Reproduction NMU **Language Arts**
Applying Spatial Concept NFC **Geometry Mechanical Drawing**	Symbolic Classification NSC **Logic/Math Programming**	Verbal Classification NMC **Science Languages**
Applying Spatial Relations NFR **Geometry Mechanical Drawing**	Symbolic Relations Applications NSR **Logic/Math Programming**	Applying Analogical Reasoning NMR ✻ ∞ **Logic Language Arts**
Applying Spatial Systems NFS • **Geometry/Science Mechanical Drawing**	Symbolic Systems Applications NSS ∞ **Programming Science**	Reproduction seMantic Sequencing NMS ✻ ∞ **Language Arts**
Spatial Transformation Applications NFT • **Geometry/Architecture Mechanical Drawing**	Symbolic Transformations NST ∞ **Reading/Math Word Processing**	Verbal Transformations NMT ✻ ∞ **Math (word problems) Language Arts**
Spatial Implications NFI • **Geometry/Engineering Mechanical Drawing**	Algebra NSI ∞ **Logic/Math Programming**	seMantic Implications NMI ✻ ∞ **Language Arts Logic/Forensics**

Note: From *An Interpretation Guide with Strategies for Using SOI*, p.69-71, by M. Meeker, 2000, Vida, OR: SOI Systems. Copyright 2000 by Mary Meeker. Reprinted with permission of Robert Meeker.

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This dissertation was typed by Kathy Wheeler.

ABSTRACT

THE INFLUENCE OF RESPECTING THE INDIVIDUAL CHILD'S LEARNING SYSTEM ON EARLY ACADEMIC DEVELOPMENT

By Audrey Marie Parker Arnold, Ed. D., 2008
College of Education
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Analyzing the effect of Structure of the Intellect (SOI) Certified Learning Kindergarten (CLK) on the academic development of five kindergarten classes in five elementary schools, in a small urban, Title I school district located in the southwestern United States was the purpose of this study. Ninety-four students from the five campuses were randomly selected to participate in the CLK pilot program. Their Texas Primary Reading Inventory (TPRI) prescreening and post participation scores were compared with the TPRI prescreening and post participation scores of the 289 non-participating students in sixteen other traditional (TRD) kindergarten classrooms. The end of year (EOY) summary screening results showed a minimal growth advantage (1%) of CLK classes over TRD classes. The EOY listening comprehension scores showed a moderate growth advantage (7%) in CLK classes as compared to TRD classes. The retention rate for the CLK classes was lower (4 out of 94 students or 4.3%) than that of the TRD classes (22 out of 289 or 7.6%). The CLK classes had no special education referrals. The qualitative data collected from weekly meetings, classroom observations, and teacher interviews suggested four significant conclusions. First, the CLK teachers believed that knowing the individual needs of their students and having prescriptive support for addressing those needs made them more effective teachers. Second,

the CLK teachers agreed that CLK changed their philosophy of teaching towards a more child-centered approach, making them teachers of one instead of teachers of many. Third, the success the students experienced as individual learners resulted in an increase in the students' self-investment and responsibility in learning. Fourth, CLK changed the learning culture in the classrooms by fostering a community of support. Students demonstrated acceptance of individual differences, recognizing responsibility for their own learning and the shared responsibility of supporting a classmate's learning. The teachers concluded that CLK positively impacted both the teacher-student and student-student relationships in the class.